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Al-Murrani et al.

(54) **METHODS AND COMPOSITIONS FOR DIAGNOSING OSTEOARTHRITIS IN A FELINE**

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(51) **Int. Cl.**

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C40B 30/04	(2006.01)
C07H 21/04	(2006.01)
C07K 16/18	(2006.01)
C07K 16/40	(2006.01)

(52) **U.S. Cl.** **506/9**; 436/501; 435/7.4; 436/94; 435/6; 536/23.1; 530/389.1; 530/388.2; 530/388.26

(57) **ABSTRACT**

Methods, compositions and kits for diagnosing osteoarthritis in a feline are disclosed. The methods of the invention comprise detecting differential expression of at least one biomarker in a body sample. preferably a blood sample, where the biomarker is differentially expressed in osteoarthritis.

Top-Blast-Annot	Top-Match%.	P-value	Mean-Ratio	Fold-Change	Top-Accn	Hum-Annot	Hum-Id	Hum-Match%
PREDICTED: Canis familiaris similar to SPARC precursor (Secreted protein acidic and rich in cysteine) (Osteonectin) (ON) (Basement-membrane protein 40) (BM-40) (LOC612159); mRNA	75.474957	6.00E-06	7.39773	7.39773	XM_849889	Macaca fascicularis brain cDNA; clone: QccE-10162; similar to human secreted protein; acidic; cysteine-rich (osteonectin)(SPARC); mRNA; RefSeq: NM_003118.1	AB169483	72.02073
PREDICTED: Canis familiaris similar to Interferon-induced protein with tetratricopeptide repeats 5 (IFIT-5) (Retinoic acid- and interferon-inducible 58 kDa protein) (LOC486788); mRNA	95.559846	0.000495289	3.37984	3.37984	XM_543917	Homo sapiens interferon-induced protein with tetratricopeptide repeats 5 (IFIT5); mRNA >gi|1144510|gb|U34605.1|HSU34605 Human retinoic acid- and interferon-inducible 58K protein RI58 mRNA; complete cds	NM_012420	92.27799
Canis familiaris lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); mRNA >gi|46102472|gb|AY521549.1| Canis familiaris galectin 9 (UAT) mRNA; complete cds	85.17179	0.000114001	2.00711	2.00711	NM_001003345	Homo sapiens lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); transcript variant short; mRNA	NM_002308	76.1302
PREDICTED: Pan troglodytes hypothetical LOC465771; transcript variant 4 (LOC465771); mRNA	89.839572	0.000918909	0.498995	-2.00403	XM_521189	Homo sapiens G protein-coupled receptor associated sorting protein 2; mRNA (cDNA clone IMAGE:5271751)	BC051707	89.83957
PREDICTED: Canis familiaris similar to Dickkopf related protein-3 precursor (Dkk-3) (Dickkopf-3) (hDkk-3) (LOC476857); mRNA	77.099237	0.000232116	0.474822	-2.10605	XM_534060	Homo sapiens dickkopf-3 (DKK-3) mRNA; complete cds	AF177396	31.48855
PREDICTED: Canis familiaris similar to Tetraspanin-13 (Tspan-13) (Transmembrane 4 superfamily member 13) (Tetraspan NET-6) (LOC482332); mRNA	89.830508	0.000861772	0.471024	-2.12304	XM_539449	full-length cDNA clone CS0DI065YG03 of Placenta Cot 25-normalized of Homo sapiens (human)	CR602288	50.84746
PREDICTED: Pan troglodytes similar to cytokeratin 18 (424 AA) (LOC451924); mRNA	87.234043	0.000834521	0.397539	-2.51548	XR_025386	Homo sapiens BAC clone RP11-357C22 from Y; complete sequence	AC012667	87.23404
Homo sapiens GPBP; DINB1 genes for Thr/Ser kinase; DINB1; partial cds	18.055556	0.000268377	0.385653	-2.593	AB036934	Homo sapiens chromosome 8; clone CTD-3107M8; complete sequence	AC109329	46.8254

FIGURE 1 p value < 0.001 FC >2.0

Top-Blast-Annot	Top-Match%.	P-value	Mean-Ratio	Fold-Change	Top-Accn	Hum-Annot	Hum-Id	Hum-Match%
PREDICTED: Canis familiaris similar to SPARC precursor (Secreted protein acidic and rich in cysteine) (Osteonectin) (ON) (Basement-membrane protein 40) (BM-40) (LOC612159); mRNA	75.474957	6.00E-06	7.39773	7.39773	XM_849889	Macaca fascicularis brain cDNA; clone: QccE-10162; similar to human secreted protein; acidic; cysteine-rich (osteonectin)(SPARC); mRNA; RefSeq: NM_003118.1	AB169483	72.02073
PREDICTED: Canis familiaris similar to Interferon-induced protein with tetratricopeptide repeats 5 (IFIT-5) (Retinoic acid- and interferon-inducible 58 kDa protein) (LOC486788); mRNA	95.559846	0.000495289	3.37984	3.37984	XM_543917	Homo sapiens interferon-induced protein with tetratricopeptide repeats 5 (IFIT5); mRNA >gi|1144510|gb|U34605.1|HSU34605 Human retinoic acid- and interferon-inducible 58K protein RI58 mRNA; complete cds	NM_012420	92.27799
Canis familiaris lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); mRNA >gi|46102472|gb|AY521549.1| Canis familiaris galectin 9 (UAT) mRNA; complete cds	85.17179	0.000114001	2.00711	2.00711	NM_001003345	Homo sapiens lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); transcript variant short; mRNA	NM_002308	76.1302
PREDICTED: Canis familiaris similar to WW domain binding protein 2; transcript variant 2 (LOC608477); mRNA	95.777351	0.000421214	1.999	1.999	XM_844270	Synthetic construct Homo sapiens clone FLH168862.01X; RZPDo839D1294D WBP2 mRNA; complete sequence	DQ891052	92.89827
PREDICTED: Canis familiaris similar to Galectin-3 binding protein precursor (Lectin galactoside-binding soluble 3 binding protein) (Mac-2 binding protein) (Mac-2 BP) (MAC2BP) (Tumor-associated antigen 90K) (LOC483345); mRNA	46.915888	0.000788814	1.83093	1.83093	XM_540464	Homo sapiens clone FLH184271.01L; RZPDo839E01143D LGALS3BP mRNA; partial sequence	DQ895424	43.17757
Felis catus Toll-like receptor 2 mRNA; partial cds	100	0.000391666	1.79388	1.79388	AY700369	Homo sapiens clone FLH166452.01L; RZPDo839H0185D TLR2 mRNA; partial sequence	DQ894005	84.53782
PREDICTED: Canis familiaris similar to uridine phosphorylase 1 (LOC480772); mRNA	86.587771	0.000366772	1.7344	1.7344	XM_537889	NULL	NULL	NA
PREDICTED: Canis familiaris similar to monoacylglycerol O-acyltransferase 1 (LOC488548); mRNA	54.766031	0.000815306	1.71051	1.71051	XM_545667	Homo sapiens monoacylglycerol O-acyltransferase 1 (MOGAT1); mRNA >gi|15099956|gb|AF384163.1|AF384163 Homo sapiens diacylglycerol acyltransferase 2-like protein mRNA; complete cds	NM_058165	48.87348
Synthetic construct Homo sapiens clone FLH189257.01X;	97.790055	0.000488898	1.62476	1.62476	DQ892739	Synthetic construct Homo sapiens clone FLH189257.01X; RZPDo839D0374D	DQ892739	97.79006

RZPDo839D0374D PKM2 mRNA; complete sequence						PKM2 mRNA; complete sequence		
Homo sapiens WD repeat and FYVE domain containing 3 (WDFY3); transcript variant 1; mRNA	43.818182	0.00031426	1.55407	1.55407	NM_014991	Homo sapiens mRNA for KIAA0993 protein; partial cds	AB023210	43.81818
PREDICTED: Canis familiaris similar to RAB6 interacting protein 1 (LOC476844); mRNA	95.789474	0.0007268	1.5436	1.5436	XM_534048	Homo sapiens RAB6 interacting protein 1 (RAB6IP1); mRNA	NM_015213	95.78947
PREDICTED: Canis familiaris similar to Coronin-1C (Coronin-3) (hCRNN4) (LOC486318); mRNA	86.379928	0.000634606	1.53908	1.53908	XM_543444	Homo sapiens coronin; actin binding protein; 1C (CORO1C); mRNA	NM_014325	84.76703
Mus musculus cDNA; RIKEN full-length enriched library; clone:M5C1025E14 product:SM-11044 binding protein; full insert sequence	41.078838	0.00024756	0.66585	-1.50184	NM_133352	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Hypothetical UPF0049 protein ZK1128.2 in chromosome III; transcript variant 2 (LOC480655); mRNA	90.569395	0.000365505	0.660748	-1.51344	XM_863412	Macaca fascicularis testis cDNA clone: QtsA-10049; similar to human hypothetical protein MGC3329 (MGC3329); mRNA; RefSeq: NM_024086.2	AB168137	86.6548
PREDICTED: Canis familiaris similar to reticulocalbin 2 (LOC487666); mRNA	94.800693	0.000486882	0.66019	-1.51472	XM_544790	full-length cDNA clone CS0DI049YK06 of Placenta Cot 25-normalized of Homo sapiens (human)	CR626289	90.81456
PREDICTED: Canis familiaris similar to RAB GTPase activating protein 1-like; transcript variant 2 (LOC480064); mRNA	34.863946	0.000593008	0.655626	-1.52526	XM_856054	Human DNA sequence from clone RP1-102G20 on chromosome 1q24-25 Contains a novel pseudogene; two novel genes; a ribosomal protein S26 (RPS26) pseudogenem; the 3-prime end of the gene for expressed in hematopoietic cells (heart; liver) (HLL); the gene for Siah-interacting protein (SIP); the 3-prime end of the MRPS14 gene for mitochondrial ribosomal protein S14 and a CpG island; complete sequence	Z99127	33.84354
PREDICTED: Canis familiaris similar to ATP-binding cassette; sub-family A ; member 5; transcript variant 6 (LOC480455); mRNA	91.588785	0.000204232	0.65392	-1.52924	XM_857754	Homo sapiens mRNA for KIAA1888 protein; partial cds	AB067475	89.01869
Felis catus CD7 antigen (CD7); mRNA >gi|49022600|dbj|AB154850.1| Felis catus fCD7 mRNA for feline CD7; complete cds	100	2.48E-05	0.647573	-1.54423	NM_001009296	Homo sapiens clone FLH187866.01L; RZPDo839D12149D CD7 mRNA; partial sequence	DQ895810	15.71125
PREDICTED: Canis familiaris similar to Gamma enolase (2-phospho-D-glycerate hydro-lyase) (Neural enolase) (Neuron-specific enolase)	12.550607	0.000987345	0.640072	-1.56232	XM_534902	Homo sapiens BAC clone RP11-418H16 from 2; complete sequence	AC007389	6.07287

(NSE) (Enolase 2); transcript variant 2 (LOC477709); mRNA								
PREDICTED: Canis familiaris similar to basic leucine zipper and W2 domains 2; transcript variant 1 (LOC475250); mRNA	96.930946	0.00028323	0.628615	-1.5908	XM_532484	Homo sapiens clone FLH186853.01L; RZPDo839B0362D BZW2 mRNA; partial sequence	DQ895708	95.39642
PREDICTED: Pan troglodytes similar to Zinc finger CCCH-type containing 14 (LOC453092); mRNA	9.186352	0.000972554	0.628134	-1.59202	XM_612741	Homo sapiens putative NY-REN-37 antigen isoform 4 mRNA; complete cds; alternatively spliced	AY578063	9.18635
Felis catus BCL2B-cell CLL/lymphoma 2 (BCL2); mRNA >gi|25166610|dbj|AB096611.1| Felis catus mRNA for bcl-2 protein; complete cds	86.222222	0.000350779	0.625335	-1.59914	NM_001009340	Homo sapiens B-cell CLL/lymphoma 2 (BCL2); nuclear gene encoding mitochondrial protein; transcript variant alpha; mRNA	NM_000633	79.77778
PREDICTED: Canis familiaris similar to Selenoprotein P precursor (SeP); transcript variant 1 (LOC479346); mRNA	40.238095	0.000929008	0.624247	-1.60193	XM_862927	Homo sapiens selenoprotein P; plasma; 1 (SEPP1); mRNA	NM_005410	24.52381
PREDICTED: Canis familiaris similar to SH3 domain-binding protein 5 (SH3 domain-binding protein that preferentially associates with BTK) (LOC485657); mRNA	93.691589	0.000143766	0.621661	-1.60859	XM_542777	Synthetic construct Homo sapiens clone FLH190536.01X; RZPDo839B0576D SH3BP5 mRNA; complete sequence	DQ892875	91.35514
Homo sapiens PC4 and SFRS1 interacting protein 1 (PSIP1); transcript variant 2; mRNA >gi|3283351|gb|AF063020.1|AF063020 Homo sapiens lens epithelium-derived growth factor mRNA; complete cds	86.310905	0.00020451	0.604892	-1.65319	NM_033222	Homo sapiens lens epithelium-derived growth factor gene; alternatively spliced; complete cds	AF199339	86.31091
Homo sapiens zinc finger protein 642 (ZNF642); mRNA	54.51448	0.000270517	0.604648	-1.65385	XM_599813	Human DNA sequence from clone RP11-656D10 on chromosome 1 Contains the gene for a novel zinc finger protein; the gene for a novel protein and three novel genes; complete sequence	AL603839	54.51448
PREDICTED: Canis familiaris similar to basic leucine zipper and W2 domains 2; transcript variant 1 (LOC475250); mRNA	62.146893	7.76E-05	0.603506	-1.65698	XM_857370	full-length cDNA clone CS0DI012YJ02 of Placenta Cot 25-normalized of Homo sapiens (human)	CR621525	61.01695
PREDICTED: Canis familiaris similar to Zinc finger protein 292 (LOC481908); mRNA	96.601942	0.000810683	0.602344	-1.66018	XM_539029	PREDICTED: Homo sapiens zinc finger protein 292; transcript variant 4 (ZNF292); mRNA	XM_938563	93.93204
Felis catus CD3 antigen epsilon (CD3E); mRNA >gi|56378114|dbj|AB195840.1| Felis catus cd3e mRNA for CD3 antigen epsilon subunit; complete cds;	83.159722	0.000581424	0.590272	-1.69413	NM_001009862	NULL	NULL	NA

cell_type:thymocyte								
PREDICTED: Bos taurus similar to Interleukin 6 signal transducer (gp130; oncostatin M receptor) (LOC522155); mRNA	12.690355	0.000422493	0.579601	-1.72532	XM_001100601	Human Meis1-related protein 2 (MRG2); mRNA; partial cds	U68385	8.46024
PREDICTED: Canis familiaris similar to Protein C22orf8 (LOC481208); mRNA	48.101266	0.000747509	0.57799	-1.73013	XM_538329	Homo sapiens family with sequence similarity 118; member A; mRNA (cDNA clone MGC:8848 IMAGE:3860694); complete cds	BC013696	44.48463
PREDICTED: Canis familiaris similar to Nonhistone chromosomal protein HMG-14 (High-mobility group nucleosome binding domain 1); transcript variant 2 (LOC608119); mRNA	93.735499	0.000294192	0.577286	-1.73224	XM_844714	PREDICTED: Homo sapiens similar to Nonhistone chromosomal protein HMG-14 (High-mobility group nucleosome-binding domain-containing protein 1) (LOC728851); mRNA	XM_001132231	65.89327
Felis catus mRNA for TCR alpha constant chain; partial cds	100	8.11E-05	0.57407	-1.74195	D89022	NULL	NULL	NA
Homo sapiens mRNA; cDNA DKFZp686H1697 (from clone DKFZp686H1697)	27.293578	0.000661059	0.570125	-1.754	BX647547	Homo sapiens mRNA; cDNA DKFZp686H1697 (from clone DKFZp686H1697)	BX647547	27.29358
PREDICTED: Canis familiaris similar to DNA-binding protein SATB1 (Special AT-rich sequence binding protein 1) (LOC485650); mRNA	98.960499	0.000107709	0.542275	-1.84408	XM_542770	NULL	NULL	NA
PREDICTED: Pan troglodytes similar to profilin IIa (LOC460989); mRNA	97.336562	0.000932347	0.540383	-1.85054	XM_516998	Homo sapiens profilin 2 (PFN2); transcript variant 1; mRNA	NM_053024	97.33656
PREDICTED: Pan troglodytes hypothetical LOC465771; transcript variant 4 (LOC465771); mRNA	89.839572	0.000918909	0.498995	-2.00403	XM_521189	Homo sapiens G protein-coupled receptor associated sorting protein 2; mRNA (cDNA clone IMAGE:5271751)	BC051707	89.83957
PREDICTED: Canis familiaris similar to Dickkopf related protein-3 precursor (Dkk-3) (Dickkopf-3) (hDkk-3) (LOC476857); mRNA	77.099237	0.000232116	0.474822	-2.10605	XM_534060	Homo sapiens dickkopf-3 (DKK-3) mRNA; complete cds	AF177396	31.48855
PREDICTED: Canis familiaris similar to Tetraspanin-13 (Tspan-13) (Transmembrane 4 superfamily member 13) (Tetraspan NET-6) (LOC482332); mRNA	89.830508	0.000861772	0.471024	-2.12304	XM_539449	full-length cDNA clone CS0DI065YG03 of Placenta Cot 25-normalized of Homo sapiens (human)	CR602288	50.84746
PREDICTED: Pan troglodytes similar to cytokeratin 18 (424 AA) (LOC451924); mRNA	87.234043	0.000834521	0.397539	-2.51548	XR_025386	Homo sapiens BAC clone RP11-357C22 from Y; complete sequence	AC012667	87.23404
Homo sapiens GPBP; DINB1 genes for Thr/Ser kinase; DINB1; partial cds	18.055556	0.000268377	0.385653	-2.593	AB036934	Homo sapiens chromosome 8; clone CTD-3107M8; complete sequence	AC109329	46.8254

FIGURE 2 p value < 0.001 FC >1.5

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Canis familiaris lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); mRNA >gi|46102472|gb|AY521549.1| Canis familiaris galectin 9 (UAT) mRNA; complete cds	85.17179	0.000114001	2.00711	2.00711	NM_001003345	Homo sapiens lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); transcript variant short; mRNA	NM_002308	76.1302
PREDICTED: Canis familiaris similar to WW domain binding protein 2; transcript variant 2 (LOC608477); mRNA	95.777351	0.000421214	1.999	1.999	XM_844270	Synthetic construct Homo sapiens clone FLH168862.01X; RZPDo839D1294D WBP2 mRNA; complete sequence	DQ891052	92.89827
PREDICTED: Canis familiaris similar to Galectin-3 binding protein precursor (Lectin galactoside-binding soluble 3 binding protein) (Mac-2 binding protein) (Mac-2 BP) (MAC2BP) (Tumor-associated antigen 90K) (LOC483345); mRNA	46.915888	0.000788814	1.83093	1.83093	XM_540464	Homo sapiens clone FLH184271.01L; RZPDo839E01143D LGALS3BP mRNA; partial sequence	DQ895424	43.17757
Felis catus Toll-like receptor 2 mRNA; partial cds	100	0.000391666	1.79388	1.79388	AY700369	Homo sapiens clone FLH166452.01L; RZPDo839H0185D TLR2 mRNA; partial sequence	DQ894005	84.53782
PREDICTED: Canis familiaris similar to uridine phosphorylase 1 (LOC480772); mRNA	86.587771	0.000366772	1.7344	1.7344	XM_537889	NULL	NULL	NA
PREDICTED: Canis familiaris similar to monoacylglycerol O-acyltransferase 1 (LOC488548); mRNA	54.766031	0.000815306	1.71051	1.71051	XM_545667	Homo sapiens monoacylglycerol O-acyltransferase 1 (MOGAT1); mRNA >gi|15099956|gb|AF384163.1|AF384163 Homo sapiens diacylglycerol acyltransferase 2-like protein mRNA; complete cds	NM_058165	48.87348
Synthetic construct Homo sapiens clone FLH189257.01X;	97.790055	0.000488898	1.62476	1.62476	DQ892739	Synthetic construct Homo sapiens clone FLH189257.01X; RZPDo839D0374D	DQ892739	97.79006

RZPDo839D0374D PKM2 mRNA; complete sequence						PKM2 mRNA; complete sequence		
Homo sapiens WD repeat and FYVE domain containing 3 (WDFY3); transcript variant 1; mRNA	43.818182	0.00031426	1.55407	1.55407	NM_014991	Homo sapiens mRNA for KIAA0993 protein; partial cds	AB023210	43.81818
PREDICTED: Canis familiaris similar to RAB6 interacting protein 1 (LOC476844); mRNA	95.789474	0.0007268	1.5436	1.5436	XM_534048	Homo sapiens RAB6 interacting protein 1 (RAB6IP1); mRNA	NM_015213	95.78947
PREDICTED: Canis familiaris similar to Coronin-1C (Coronin-3) (hCRNN4) (LOC486318); mRNA	86.379928	0.000634606	1.53908	1.53908	XM_543444	Homo sapiens coronin; actin binding protein: 1C (CORO1C); mRNA	NM_014325	84.76703
PREDICTED: Bos taurus similar to MMAC1 (LOC540786); mRNA	46.236559	4.84E-05	1.45046	1.45046	XM_613125	Macaca fascicularis testis cDNA; clone: QtsA-19057; similar to human phosphatase and tensin homolog (mutated in multipleadvanced cancers 1) (PTEN); mRNA; RefSeq: NM_000314.2	AB169328	45.3405
PREDICTED: Canis familiaris similar to RAB6 interacting protein 1 (LOC476844); mRNA	93.846154	2.32E-05	1.3956	1.3956	XM_534048	Homo sapiens RAB6 interacting protein 1 (RAB6IP1); mRNA	NM_015213	45.98291
PREDICTED: Canis familiaris similar to Glucose-6-phosphate 1-dehydrogenase (G6PD) (LOC481088); mRNA	90.989399	5.51E-05	1.35837	1.35837	XM_538209	Homo sapiens clone FLH184178.01L; RZPDo839D01143D G6PD mRNA; partial sequence	DQ895415	89.39929
Bos taurus mitogen-activated protein kinase 13 (MAPK13); mRNA >gi|59858092|gb|BT020864.1| Bos taurus mitogen-activated protein kinase 13 (MAPK13); mRNA; complete cds	83.365571	0.000837587	1.33557	1.33557	NM_001014947	Homo sapiens clone FLH176308.01L; RZPDo839B11121D MAPK13 mRNA; partial sequence	DQ894551	61.5087
PREDICTED: Macaca mulatta similar to ring finger protein 167; transcript variant 10 (LOC710656); mRNA	90.235081	0.000712076	1.33483	1.33483	XM_001098694	NULL	NULL	NA
PREDICTED: Canis familiaris similar to acetyl-CoA synthetase 2-like (LOC477002); mRNA	83.070866	0.000756832	1.31127	1.31127	XM_534200	Homo sapiens mRNA; cDNA DKFZp666G0810 (from clone DKFZp666G0810)	AL832939	36.81102
Felis catus fms-related tyrosine kinase 3 ligand (FLT3LG); mRNA >gi|9367030|gb|AF155149.1|AF155149 Felis catus Flt3 ligand mRNA; complete cds	53.184165	0.000103573	0.766372	-1.30485	NM_001009842	Human FLT3/FLK2 ligand mRNA; complete cds	U04806	28.39931
Pongo pygmaeus mRNA; cDNA DKFZp469M0635 (from clone DKFZp469M0635)	58.053097	0.000388473	0.765168	-1.3069	CR857728	NULL	NULL	NA
Bos taurus similar to hypothetical protein (FLJ20436); mRNA >gi|61554928|gb|BT021786.1| Bos taurus hypothetical protein FLJ20436	95.068027	0.000699858	0.762807	-1.31095	NM_001024571	Homo sapiens cDNA FLJ20436 fis; clone KAT03972	AK000443	79.42177

(FLJ20436); mRNA; complete cds								
PREDICTED: Canis familiaris similar to Glutaminase; kidney isoform; mitochondrial precursor (GLS) (L-glutamine amidohydrolase) (K-glutaminase); transcript variant 1 (LOC488448); mRNA	98	0.000563063	0.759107	-1.31734	XM_545570	Homo sapiens glutaminase kidney isoform mRNA; complete cds	AF223943	95.42857
PREDICTED: Canis familiaris similar to eukaryotic translation elongation factor 1 beta 2; transcript variant 4 (LOC478881); mRNA	46.714032	0.000584197	0.754545	-1.3253	XM_854805	NULL	NULL	NA
PREDICTED: Canis familiaris similar to malic enzyme 3; NADP(+)-dependent; mitochondrial; transcript variant 1 (LOC485151); mRNA	99.103943	0.000512734	0.737489	-1.35595	XM_542269	Homo sapiens malic enzyme 3; NADP(+)-dependent; mitochondrial (ME3); nuclear gene encoding mitochondrial protein; transcript variant 1; mRNA	NM_006680	94.98208
Bos taurus mRNA for similar to 40S ribosomal protein S18; partial cds; clone: ORCS10048	93.348624	9.83E-05	0.733165	-1.36395	AB098889	Macaca fascicularis testis cDNA clone: QtsA-13881; similar to human ribosomal protein S18 (RPS18); mRNA; RefSeq: NM_022551.2	AB168656	92.43119
Felis catus clone vb15 T-cell receptor beta chain mRNA; partial cds	100	0.000367395	0.730589	-1.36876	AY316125	Homo sapiens T cell receptor beta variable region; Vbeta 5S1AT-PGQGAYEQYF-2.7 mRNA; partial cds	AF430648	66.66667
Bos taurus mRNA for similar to 40S ribosomal protein S18; partial cds; clone: ORCS10048	93.348624	0.000110672	0.730375	-1.36916	AB098889	Macaca fascicularis testis cDNA clone: QtsA-13881; similar to human ribosomal protein S18 (RPS18); mRNA; RefSeq: NM_022551.2	AB168656	92.43119
Felis catus CXCR-4 homolog mRNA; complete cds	100	0.000399332	0.730116	-1.36965	U63558	NULL	NULL	NA
PREDICTED: Canis familiaris similar to CG9882-PA (LOC475460); mRNA	92.943548	0.000251047	0.727037	-1.37545	XM_532684	Homo sapiens hypothetical protein BC004337 (LOC90826); mRNA >gi|39963106|gb|BC064403.1| Homo sapiens hypothetical protein BC004337; mRNA (cDNA clone MGC:75212 IMAGE:5547611); complete cds	NM_138364	87.70161
PREDICTED: Canis familiaris similar to 26S proteasome non-ATPase regulatory subunit 10 (26S proteasome regulatory subunit p28) (Gankyrin); transcript variant 5 (LOC481014); mRNA	39.506173	0.000948069	0.71437	-1.39984	XM_857630	Homo sapiens proteasome (prosome; macropain) 26S subunit; non-ATPase; 10 (PSMD10); transcript variant 2; mRNA	NM_170750	20.10582
Homo sapiens SMT3 suppressor of mif two 3 homolog 2 (S. cerevisiae) (SUMO2); transcript variant 1; mRNA	100	0.000549172	0.712636	-1.40324	AK225090	Homo sapiens mRNA for SMT3 suppressor of mif two 3 homolog 2 variant; clone: CAS08355	AK225090	100
Homo sapiens ribosomal protein L36 (RPL36); transcript variant 1; mRNA	59.215017	0.000269341	0.704651	-1.41914	NM_033643	Homo sapiens ribosomal protein L36 (RPL36); transcript variant 1; mRNA	NM_033643	59.21502

PREDICTED: Canis familiaris similar to retinoblastoma binding protein 7; transcript variant 4 (LOC480854); mRNA	96.113074	0.000984561	0.703222	-1.42203	XM_852758	Human retinoblastoma-binding protein (RbAp46) mRNA; complete cds	U35143	92.40283
PREDICTED: Bos taurus similar to KIAA0853 protein (LOC504380); partial mRNA	87.265136	0.000186865	0.703183	-1.4221	XM_580489	Homo sapiens chromosome 18; clone; complete sequence	AC139100	86.8476
PREDICTED: Canis familiaris similar to ATP-binding cassette; sub-family A ; member 5; transcript variant 2 (LOC480455); mRNA	91.193738	0.000185605	0.693476	-1.44201	XM_857657	Homo sapiens ATP-binding cassette; sub-family A (ABC1); member 5 (ABCA5); transcript variant 2; mRNA	NM_172232	84.93151
PREDICTED: Canis familiaris similar to CD59 antigen p18-20 (LOC475945); mRNA	20.272904	0.000487127	0.690112	-1.44904	XM_533156	Human DNA sequence from clone RP11-136K14 on chromosome 6 Contains three novel genes; the 5-prime end of a novel gene (contains FLJ31738 and KIAA1209) and a CpG island; complete sequence	AL450344	3.89864
PREDICTED: Canis familiaris similar to Calcium/calmodulin-dependent protein kinase type II delta chain (CaM-kinase II delta chain) (CaM kinase II delta subunit) (CaMK-II delta subunit) (LOC610764); mRNA	96.745562	2.50E-05	0.687345	-1.45487	XM_848313	Homo sapiens clone FLH182796.01L; RZPDo839C05139D CAMK2D mRNA; partial sequence	DQ895255	95.56213
PREDICTED: Canis familiaris similar to RAS guanyl releasing protein 1; transcript variant 2 (LOC478255); mRNA	94.454383	0.000179175	0.686376	-1.45693	XM_535429	Homo sapiens calcium and DAG-regulated guanine nucleotide exchange factor II mRNA; complete cds	AF081195	91.77102
Homo sapiens cDNA FLJ39905 fis; clone SPLEN2017351; moderately similar to Xenopus laevis N-terminal acetyltransferase mRNA	66.109785	0.000292762	0.681524	-1.4673	AK097224	Homo sapiens cDNA FLJ39905 fis; clone SPLEN2017351; moderately similar to Xenopus laevis N-terminal acetyltransferase mRNA	AK097224	66.10979
Homo sapiens ribosomal protein; large; P2; mRNA (cDNA clone MGC:71408 IMAGE:4685028); complete cds	66.259169	0.000600043	0.681361	-1.46765	BC062314	Homo sapiens ribosomal protein; large; P2; mRNA (cDNA clone MGC:12453 IMAGE:4052568); complete cds	BC005354	66.25917
Sus scrofa mRNA; clone:AMP010093C02; expressed in alveolar macrophage	87.539936	0.000342523	0.678989	-1.47278	AK231094	NULL	NULL	NA
PREDICTED: Pan troglodytes etoposide induced 2.4; transcript variant 1 (EI24); mRNA	46.525097	0.000488481	0.677595	-1.47581	XM_001147121	NULL	NULL	NA
PREDICTED: Canis familiaris similar to 40S ribosomal protein S28 (LOC485010); mRNA	94.488189	0.000610333	0.673916	-1.48387	XM_542128	PREDICTED: Homo sapiens similar to 40S ribosomal protein S28 (LOC645899); mRNA	XM_941610	79.52756
Sus scrofa mRNA; clone:MLN010076E07; expressed in mesenteric lymph node	99.126638	0.000894827	0.67273	-1.48648	AK233947	NULL	NULL	NA

PREDICTED: Canis familiaris similar to diacylglycerol kinase; alpha 80kDa; transcript variant 2 (LOC474393); mRNA	94.235033	0.00019439	0.671577	-1.48903	XM_531626	Homo sapiens clone 24 diacylglycerol kinase alpha (DAGK1) mRNA; complete cds	AF064771	86.91796
Mus musculus cDNA; RIKEN full-length enriched library; clone:M5C1025E14 product:SM-11044 binding protein; full insert sequence	41.078838	0.00024756	0.66585	-1.50184	NM_133352	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Hypothetical UPF0049 protein ZK1128.2 in chromosome III; transcript variant 2 (LOC480655); mRNA	90.569395	0.000365505	0.660748	-1.51344	XM_863412	Macaca fascicularis testis cDNA clone: QtsA-10049; similar to human hypothetical protein MGC3329 (MGC3329); mRNA; RefSeq: NM_024086.2	AB168137	86.6548
PREDICTED: Canis familiaris similar to reticulocalbin 2 (LOC487666); mRNA	94.800693	0.000486882	0.66019	-1.51472	XM_544790	full-length cDNA clone CS0DI049YK06 of Placenta Cot 25-normalized of Homo sapiens (human)	CR626289	90.81456
PREDICTED: Canis familiaris similar to RAB GTPase activating protein 1-like; transcript variant 2 (LOC480064); mRNA	34.863946	0.000593008	0.655626	-1.52526	XM_856054	Human DNA sequence from clone RP1-102G20 on chromosome 1q24-25 Contains a novel pseudogene; two novel genes; a ribosomal protein S26 (RPS26) pseudogenem; the 3-prime end of the gene for expressed in hematopoietic cells (heart; liver) (HLL); the gene for Siah-interacting protein (SIP); the 3-prime end of the MRPS14 gene for mitochondrial ribosomal protein S14 and a CpG island; complete sequence	Z99127	33.84354
PREDICTED: Canis familiaris similar to ATP-binding cassette; sub-family A ; member 5; transcript variant 6 (LOC480455); mRNA	91.588785	0.000204232	0.65392	-1.52924	XM_857754	Homo sapiens mRNA for KIAA1888 protein; partial cds	AB067475	89.01869
Felis catus CD7 antigen (CD7); mRNA >gi|49022600|dbj|AB154850.1| Felis catus fCD7 mRNA for feline CD7; complete cds	100	2.48E-05	0.647573	-1.54423	NM_001009296	Homo sapiens clone FLH187866.01L; RZPDo839D12149D CD7 mRNA; partial sequence	DQ895810	15.71125
PREDICTED: Canis familiaris similar to Gamma enolase (2-phospho-D-glycerate hydro-lyase) (Neural enolase) (Neuron-specific enolase) (NSE) (Enolase 2); transcript variant 2 (LOC477709); mRNA	12.550607	0.000987345	0.640072	-1.56232	XM_534902	Homo sapiens BAC clone RP11-418H16 from 2; complete sequence	AC007389	6.07287
PREDICTED: Canis familiaris similar to basic leucine zipper and W2 domains 2; transcript variant 1 (LOC475250); mRNA	96.930946	0.00028323	0.628615	-1.5908	XM_532484	Homo sapiens clone FLH186853.01L; RZPDo839B0362D BZW2 mRNA; partial sequence	DQ895708	95.39642
PREDICTED: Pan troglodytes similar	9.186352	0.000972554	0.628134	-	XM_612741	Homo sapiens putative NY-REN-37	AY578063	9.18635

to Zinc finger CCCH-type containing 14 (LOC453092); mRNA				1.59202		antigen isoform 4 mRNA; complete cds; alternatively spliced		
Felis catus BCL2B-cell CLL/lymphoma 2 (BCL2); mRNA >gi|25166610|dbj|AB096611.1| Felis catus mRNA for bcl-2 protein; complete cds	86.222222	0.000350779	0.625335	-1.59914	NM_001009340	Homo sapiens B-cell CLL/lymphoma 2 (BCL2); nuclear gene encoding mitochondrial protein; transcript variant alpha; mRNA	NM_000633	79.77778
PREDICTED: Canis familiaris similar to Selenoprotein P precursor (SeP); transcript variant 1 (LOC479346); mRNA	40.238095	0.000929008	0.624247	-1.60193	XM_862927	Homo sapiens selenoprotein P; plasma; 1 (SEPP1); mRNA	NM_005410	24.52381
PREDICTED: Canis familiaris similar to SH3 domain-binding protein 5 (SH3 domain-binding protein that preferentially associates with BTK) (LOC485657); mRNA	93.691589	0.000143766	0.621661	-1.60859	XM_542777	Synthetic construct Homo sapiens clone FLH190536.01X; RZPDo839B0576D SH3BP5 mRNA; complete sequence	DQ892875	91.35514
Homo sapiens PC4 and SFRS1 interacting protein 1 (PSIP1); transcript variant 2; mRNA >gi|3283351|gb|AF063020.1|AF063020 Homo sapiens lens epithelium-derived growth factor mRNA; complete cds	86.310905	0.00020451	0.604892	-1.65319	NM_033222	Homo sapiens lens epithelium-derived growth factor gene; alternatively spliced; complete cds	AF199339	86.31091
Homo sapiens zinc finger protein 642 (ZNF642); mRNA	54.51448	0.000270517	0.604648	-1.65385	XM_599813	Human DNA sequence from clone RP11-656D10 on chromosome 1 Contains the gene for a novel zinc finger protein; the gene for a novel protein and three novel genes; complete sequence	AL603839	54.51448
PREDICTED: Canis familiaris similar to basic leucine zipper and W2 domains 2; transcript variant 1 (LOC475250); mRNA	62.146893	7.76E-05	0.603506	-1.65698	XM_857370	full-length cDNA clone CS0DI012YJ02 of Placenta Cot 25-normalized of Homo sapiens (human)	CR621525	61.01695
PREDICTED: Canis familiaris similar to Zinc finger protein 292 (LOC481908); mRNA	96.601942	0.000810683	0.602344	-1.66018	XM_539029	PREDICTED: Homo sapiens zinc finger protein 292; transcript variant 4 (ZNF292); mRNA	XM_938563	93.93204
Felis catus CD3 antigen epsilon (CD3E); mRNA >gi|56378114|dbj|AB195840.1| Felis catus cd3e mRNA for CD3 antigen epsilon subunit; complete cds; cell_type:thymocyte	83.159722	0.000581424	0.590272	-1.69413	NM_001009862	NULL	NULL	NA
PREDICTED: Bos taurus similar to Interleukin 6 signal transducer (gp130; oncostatin M receptor) (LOC522155); mRNA	12.690355	0.000422493	0.579601	-1.72532	XM_001100601	Human Meis1-related protein 2 (MRG2); mRNA; partial cds	U68385	8.46024
PREDICTED: Canis familiaris similar to Protein C22orf8 (LOC481208); mRNA	48.101266	0.000747509	0.57799	-1.73013	XM_538329	Homo sapiens family with sequence similarity 118; member A; mRNA (cDNA	BC013696	44.48463

						clone MGC:8848 IMAGE:3860694); complete cds		
PREDICTED: Canis familiaris similar to Nonhistone chromosomal protein HMG-14 (High-mobility group nucleosome binding domain 1); transcript variant 2 (LOC608119); mRNA	93.735499	0.000294192	0.577286	-1.73224	XM_844714	PREDICTED: Homo sapiens similar to Nonhistone chromosomal protein HMG-14 (High-mobility group nucleosome-binding domain-containing protein 1) (LOC728851); mRNA	XM_001132231	65.89327
Felis catus mRNA for TCR alpha constant chain; partial cds	100	8.11E-05	0.57407	-1.74195	D89022	NULL	NULL	NA
Homo sapiens mRNA; cDNA DKFZp686H1697 (from clone DKFZp686H1697)	27.293578	0.000661059	0.570125	-1.754	BX647547	Homo sapiens mRNA; cDNA DKFZp686H1697 (from clone DKFZp686H1697)	BX647547	27.29358
PREDICTED: Canis familiaris similar to DNA-binding protein SATB1 (Special AT-rich sequence binding protein 1) (LOC485650); mRNA	98.960499	0.000107709	0.542275	-1.84408	XM_542770	NULL	NULL	NA
PREDICTED: Pan troglodytes similar to profilin IIa (LOC460989); mRNA	97.336562	0.000932347	0.540383	-1.85054	XM_516998	Homo sapiens profilin 2 (PFN2); transcript variant 1; mRNA	NM_053024	97.33656
PREDICTED: Pan troglodytes hypothetical LOC465771; transcript variant 4 (LOC465771); mRNA	89.839572	0.000918909	0.498995	-2.00403	XM_521189	Homo sapiens G protein-coupled receptor associated sorting protein 2; mRNA (cDNA clone IMAGE:5271751)	BC051707	89.83957
PREDICTED: Canis familiaris similar to Dickkopf related protein-3 precursor (Dkk-3) (Dickkopf-3) (hDkk-3) (LOC476857); mRNA	77.099237	0.000232116	0.474822	-2.10605	XM_534060	Homo sapiens dickkopf-3 (DKK-3) mRNA; complete cds	AF177396	31.48855
PREDICTED: Canis familiaris similar to Tetraspanin-13 (Tspan-13) (Transmembrane 4 superfamily member 13) (Tetraspan NET-6) (LOC482332); mRNA	89.830508	0.000861772	0.471024	-2.12304	XM_539449	full-length cDNA clone CS0DI065YG03 of Placenta Cot 25-normalized of Homo sapiens (human)	CR602288	50.84746
PREDICTED: Pan troglodytes similar to cytokeratin 18 (424 AA) (LOC451924); mRNA	87.234043	0.000834521	0.397539	-2.51548	XR_025386	Homo sapiens BAC clone RP11-357C22 from Y; complete sequence	AC012667	87.23404
Homo sapiens GPBP; DINB1 genes for Thr/Ser kinase; DINB1; partial cds	18.055556	0.000268377	0.385653	-2.593	AB036934	Homo sapiens chromosome 8; clone CTD-3107M8; complete sequence	AC109329	46.8254

FIGURE 3 p value < 0.001 FC >1.3

Top-Blast-Annot	Top-Match%.	P-value	Mean-Ratio	Fold-Change	Top-Accn	Hum-Annot	Hum-Id	Hum-Match%
PREDICTED: Canis familiaris similar to SPARC precursor (Secreted protein acidic and rich in cysteine) (Osteonectin) (ON) (Basement-membrane protein 40) (BM-40) (LOC612159); mRNA	75.474957	6.00E-06	7.39773	7.39773	XM_849889	Macaca fascicularis brain cDNA; clone: QccE-10162; similar to human secreted protein; acidic; cysteine-rich (osteonectin)(SPARC); mRNA; RefSeq: NM_003118.1	AB169483	72.02073
PREDICTED: Canis familiaris similar to interferon-induced protein with tetratricopeptide repeats 3 (LOC606808); mRNA	83.956044	0.00164078	5.47391	5.47391	XM_843227	Homo sapiens interferon-induced protein with tetratricopeptide repeats 3; mRNA (cDNA clone MGC:3834 IMAGE:2906188); complete cds	BC004977	24.61539
Sus scrofa mRNA; clone:AMP010047A02; expressed in alveolar macrophage	24.65374	0.00411053	4.19972	4.19972	AK230808	Homo sapiens chromosome 18 clone RP11-70G19; complete sequence	AC068999	5.81718
PREDICTED: Canis familiaris similar to Interferon-induced protein with tetratricopeptide repeats 5 (IFIT-5) (Retinoic acid- and interferon-inducible 58 kDa protein) (LOC486788); mRNA	95.559846	0.000495289	3.37984	3.37984	XM_543917	Homo sapiens interferon-induced protein with tetratricopeptide repeats 5 (IFIT5); mRNA >gi|1144510|gb|U34605.1|HSU34605 Human retinoic acid- and interferon-inducible 58K protein RI58 mRNA; complete cds	NM_012420	92.27799
Macaca fascicularis brain cDNA clone: QmoA-11831; similar to human tyrosine 3-monooxygenase/tryptophan 5-monooxygenaseactivation protein; eta polypeptide (YWHAH); mRNA; RefSeq: NM_003405.2	70.208729	0.00272394	3.17002	3.17002	XM_001111955	Macaca fascicularis brain cDNA; clone: QccE-13821; similar to human tyrosine 3-monooxygenase/tryptophan 5-monooxygenaseactivation protein; eta polypeptide (YWHAH); mRNA; RefSeq: NM_003405.2	AB169524	70.01898
Canis familiaris lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); mRNA >gi|46102472|gb|AY521549.1| Canis familiaris galectin 9 (UAT) mRNA; complete cds	85.17179	0.000114001	2.00711	2.00711	NM_001003345	Homo sapiens lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); transcript variant short; mRNA	NM_002308	76.1302
PREDICTED: Pan troglodytes hypothetical LOC465771; transcript variant 4 (LOC465771); mRNA	89.839572	0.000918909	0.498995	-2.00403	XM_521189	Homo sapiens G protein-coupled receptor associated sorting protein 2; mRNA (cDNA clone IMAGE:5271751)	BC051707	89.83957
PREDICTED: Canis familiaris similar to Dickkopf related protein-3 precursor (Dkk-3)	77.099237	0.000232116	0.474822	-2.10605	XM_534060	Homo sapiens dickkopf-3 (DKK-3) mRNA; complete cds	AF177396	31.48855

(Dickkopf-3) (hDkk-3) (LOC476857); mRNA								
PREDICTED: Canis familiaris similar to Tetraspanin-13 (Tspan-13) (Transmembrane 4 superfamily member 13) (Tetraspan NET-6) (LOC482332); mRNA	89.830508	0.000861772	0.471024	-2.12304	XM_539449	full-length cDNA clone CS0DI065YG03 of Placenta Cot 25-normalized of Homo sapiens (human)	CR602288	50.84746
PREDICTED: Pan troglodytes similar to cytokeratin 18 (424 AA) (LOC451924); mRNA	87.234043	0.000834521	0.397539	-2.51548	XR_025386	Homo sapiens BAC clone RP11-357C22 from Y; complete sequence	AC012667	87.23404
Homo sapiens GPBP; DINB1 genes for Thr/Ser kinase; DINB1; partial cds	18.055556	0.000268377	0.385653	-2.593	AB036934	Homo sapiens chromosome 8; clone CTD-3107M8; complete sequence	AC109329	46.8254

FIGURE 4 p value < 0.01 FC >2.0

Top-Blast-Annot	Top-Match%.	P-value	Mean-Ratio	Fold-Change	Top-Accn	Hum-Annot	Hum-Id	Hum-Match%
PREDICTED: Canis familiaris similar to SPARC precursor (Secreted protein acidic and rich in cysteine) (Osteonectin) (ON) (Basement-membrane protein 40) (BM-40) (LOC612159); mRNA	75.474957	6.00E-06	7.39773	7.39773	XM_849889	Macaca fascicularis brain cDNA; clone: QccE-10162; similar to human secreted protein; acidic; cysteine-rich (osteonectin)(SPARC); mRNA; RefSeq: NM_003118.1	AB169483	72.02073
PREDICTED: Canis familiaris similar to interferon-induced protein with tetratricopeptide repeats 3 (LOC606808); mRNA	83.956044	0.00164078	5.47391	5.47391	XM_843227	Homo sapiens interferon-induced protein with tetratricopeptide repeats 3; mRNA (cDNA clone MGC:3834 IMAGE:2906188); complete cds	BC004977	24.61539
Sus scrofa mRNA; clone:AMP010047A02; expressed in alveolar macrophage	24.65374	0.00411053	4.19972	4.19972	AK230808	Homo sapiens chromosome 18 clone RP11-70G19; complete sequence	AC068999	5.81718
PREDICTED: Canis familiaris similar to Interferon-induced protein with tetratricopeptide repeats 5 (IFIT-5) (Retinoic acid- and interferon-inducible 58 kDa protein) (LOC486788); mRNA	95.559846	0.000495289	3.37984	3.37984	XM_543917	Homo sapiens interferon-induced protein with tetratricopeptide repeats 5 (IFIT5); mRNA >gi|1144510|gb|U34605.1|HSU34605 Human retinoic acid- and interferon-inducible 58K protein RI58 mRNA; complete cds	NM_012420	92.27799
Macaca fascicularis brain cDNA clone: QmoA-11831; similar to human tyrosine 3-monooxygenase/tryptophan 5-monooxygenaseactivation protein; eta polypeptide (YWHAH); mRNA; RefSeq: NM_003405.2	70.208729	0.00272394	3.17002	3.17002	XM_001111955	Macaca fascicularis brain cDNA; clone: QccE-13821; similar to human tyrosine 3-monooxygenase/tryptophan 5-monooxygenaseactivation protein; eta polypeptide (YWHAH); mRNA; RefSeq: NM_003405.2	AB169524	70.01898
Canis familiaris lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); mRNA >gi|46102472|gb|AY521549.1| Canis familiaris galectin 9 (UAT) mRNA; complete cds	85.17179	0.000114001	2.00711	2.00711	NM_001003345	Homo sapiens lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); transcript variant short; mRNA	NM_002308	76.1302
PREDICTED: Canis familiaris similar to WW domain binding protein 2; transcript variant 2 (LOC608477); mRNA	95.777351	0.000421214	1.999	1.999	XM_844270	Synthetic construct Homo sapiens clone FLH168862.01X; RZPDo839D1294D WBP2 mRNA; complete sequence	DQ891052	92.89827
PREDICTED: Canis familiaris similar to Galectin-3-binding protein precursor (Lectin galactoside-binding soluble 3 binding protein) (Mac-2 binding protein) (Mac-2 BP) (MAC2BP) (Tumor-associated antigen 90K) (LOC483345); mRNA	46.915888	0.000788814	1.83093	1.83093	XM_540464	Homo sapiens clone FLH184271.01L; RZPDo839E01143D LGALS3BP mRNA; partial sequence	DQ895424	43.17757
Felis catus Toll-like receptor 2 mRNA;	100	0.000391666	1.79388	1.79388	AY700369	Homo sapiens clone FLH166452.01L;	DQ894005	84.53782

partial cds						RZPDo839H0185D TLR2 mRNA; partial sequence		
PREDICTED: Canis familiaris similar to Superoxide dismutase [Mn]; mitochondrial precursor; transcript variant 4 (LOC476258); mRNA	94.117647	0.005668	1.76071	1.76071	XM_857493	Homo sapiens cDNA FLJ40076 fis; clone TESTI2000874; highly similar to SUPEROXIDE DISMUTASE [MN]; MITOCHONDRIAL PRECURSOR (EC 1.15.1.1)	AK097395	73.62429
PREDICTED: Canis familiaris similar to uridine phosphorylase 1 (LOC480772); mRNA	86.587771	0.000366772	1.7344	1.7344	XM_537889	NULL	NULL	NA
PREDICTED: Canis familiaris similar to monoacylglycerol O-acyltransferase 1 (LOC488548); mRNA	54.766031	0.000815306	1.71051	1.71051	XM_545667	Homo sapiens monoacylglycerol O-acyltransferase 1 (MOGAT1); mRNA >gi|15099956|gb|AF384163.1|AF384163 Homo sapiens diacylglycerol acyltransferase 2-like protein mRNA; complete cds	NM_058165	48.87348
PREDICTED: Canis familiaris similar to microtubule-associated protein; RP/EB family; member 3; transcript variant 10 (LOC475694); mRNA	94.279176	0.00904561	1.67324	1.67324	XM_855042	NULL	NULL	NA
Macaca fascicularis brain cDNA clone: QflA-20750; similar to human RALBP1 associated Eps domain containing 2 (REPS2); mRNA; RefSeq: NM_004726.1	85.887097	0.00204749	1.64343	1.64343	XR_014560	Homo sapiens RALBP1 associated Eps domain containing 2 (REPS2); mRNA >gi|2895090|gb|AF010233.1|AF010233 Homo sapiens RalBP1-interacting protein (POB1) mRNA; complete cds	NM_004726	79.03226
Synthetic construct Homo sapiens clone FLH189257.01X; RZPDo839D0374D PKM2 mRNA; complete sequence	97.790055	0.000488898	1.62476	1.62476	DQ892739	Synthetic construct Homo sapiens clone FLH189257.01X; RZPDo839D0374D PKM2 mRNA; complete sequence	DQ892739	97.79006
Sus scrofa mRNA; clone:OVRM10206D03; expressed in ovary	89.932886	0.00385443	1.57559	1.57559	AK236587	Human glycogenin mRNA; complete cds	U31525	88.92617
PREDICTED: Bos taurus similar to DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide RIG-I; transcript variant 1 (LOC504760); mRNA	86.550976	0.00563556	1.56731	1.56731	XM_580928	Homo sapiens DEAD (Asp-Glu-Ala-Asp) box polypeptide 58 (DDX58); mRNA	NM_014314	81.3449
PREDICTED: Canis familiaris similar to WW domain binding protein 2; transcript variant 3 (LOC608477); mRNA	99.145299	0.00442171	1.56679	1.56679	XM_853511	NULL	NULL	NA
Homo sapiens mRNA for uncoupling protein 2 variant; clone: adSU01813	90.721649	0.00383548	1.56187	1.56187	AK222557	Homo sapiens mRNA for uncoupling protein 2 variant; clone: adSU01813	AK222557	90.72165
Homo sapiens WD repeat and FYVE domain containing 3 (WDFY3); transcript variant 1; mRNA	43.818182	0.00031426	1.55407	1.55407	NM_014991	Homo sapiens mRNA for KIAA0993 protein; partial cds	AB023210	43.81818
PREDICTED: Canis familiaris similar to	95.789474	0.0007268	1.5436	1.5436	XM_534048	Homo sapiens RAB6 interacting protein	NM_015213	95.78947

RAB6 interacting protein 1 (LOC476844); mRNA						1 (RAB6IP1); mRNA		
PREDICTED: Canis familiaris similar to Coronin-1C (Coronin-3) (hCRNN4) (LOC486318); mRNA	86.379928	0.000634606	1.53908	1.53908	XM_543444	Homo sapiens coronin; actin binding protein; 1C (CORO1C); mRNA	NM_014325	84.76703
Felis catus toll-like receptor 4 (TLR4); mRNA >gi|13810544|dbj|AB060687.1| Felis catus mRNA for Toll-like receptor 4; complete cds	100	0.00533979	1.52344	1.52344	NM_001009223	NULL	NULL	NA
PREDICTED: Canis familiaris similar to talin 1; transcript variant 12 (LOC474759); mRNA	95.627376	0.00359437	1.52083	1.52083	XM_861653	Homo sapiens mRNA for KIAA1027 protein; partial cds	AB028950	93.34601
PREDICTED: Canis familiaris similar to selenoprotein N; 1 isoform 2 precursor (LOC612211); mRNA	93.939394	0.00862369	1.51967	1.51967	XM_849947	Homo sapiens selenoprotein N; 1 (SEPN1); transcript variant 2; mRNA	NM_206926	90.90909
PREDICTED: Canis familiaris similar to Protein C10orf86 (LOC477849); mRNA	94.478528	0.00517493	0.666263	-1.50091	XM_535041	Homo sapiens mRNA for chromosome 10 open reading frame 86 variant; clone: adKA01794	AK222487	86.19632
PREDICTED: Bos taurus hypothetical LOC534513 (LOC534513); mRNA	84.705882	0.00173171	0.666133	-1.5012	XM_614308	Macaca fascicularis testis cDNA clone: QtsA-20060; similar to human retinoblastoma-associated protein 140 (RAP140); mRNA; RefSeq: NM_015224.1	AB179442	83.76471
Mus musculus cDNA; RIKEN full-length enriched library; clone:M5C1025E14 product:SM-11044 binding protein; full insert sequence	41.078838	0.00024756	0.66585	-1.50184	NM_133352	NULL	NULL	NA
PREDICTED: Canis familiaris similar to senataxin; transcript variant 1 (LOC480691); mRNA	12.133891	0.00198021	0.665668	-1.50225	XM_537811	Homo sapiens cDNA FLJ10594 fis; clone NT2RP2004689	AK001456	10.46025
PREDICTED: Canis familiaris similar to Matrin 3; transcript variant 14 (LOC474700); mRNA	95.26749	0.00344809	0.664402	-1.50511	XM_859179	NULL	NULL	NA
PREDICTED: Canis familiaris similar to N-chimaerin (NC) (N-chimerin) (Alpha chimerin) (A-chimaerin) (Rho-GTPase-activating protein 2); transcript variant 5 (LOC478805); mRNA	92.738589	0.00342536	0.662693	-1.50899	XM_856374	NULL	NULL	NA
PREDICTED: Bos taurus hypothetical protein LOC787342 (LOC787342); mRNA	88.036117	0.0087753	0.66229	-1.50991	NM_001075429	full-length cDNA clone CS0DF016YH11 of Fetal brain of Homo sapiens (human)	CR595568	52.3702
PREDICTED: Canis familiaris similar to Hypothetical UPF0049 protein ZK1128.2 in chromosome III; transcript variant 2 (LOC480655); mRNA	90.569395	0.000365505	0.660748	-1.51344	XM_863412	Macaca fascicularis testis cDNA clone: QtsA-10049; similar to human hypothetical protein MGC3329 (MGC3329); mRNA; RefSeq: NM_024086.2	AB168137	86.6548

PREDICTED: Canis familiaris similar to reticulocalbin 2 (LOC487666); mRNA	94.800693	0.000486882	0.66019	-1.51472	XM_544790	full-length cDNA clone CS0DI049YK06 of Placenta Cot 25-normalized of Homo sapiens (human)	CR626289	90.81456
PREDICTED: Canis familiaris similar to inosine 5-phosphate dehydrogenase 2; transcript variant 8 (LOC476630); mRNA	95.278246	0.00839151	0.658905	-1.51767	XM_857781	NULL	NULL	NA
PREDICTED: Canis familiaris similar to polycomb group ring finger 6 isoform a (LOC609633); mRNA	86.116323	0.00155722	0.65881	-1.51789	XM_846928	Macaca fascicularis testis cDNA clone: QtsA-18584; similar to human ring finger protein 134 (RNF134); mRNA; RefSeq: NM_032154.3	AB179371	31.89493
PREDICTED: Canis familiaris similar to nucleophosmin 1; transcript variant 13 (LOC479292); mRNA	96.030246	0.00319269	0.655819	-1.52481	XM_861701	NULL	NULL	NA
Homo sapiens cDNA: FLJ23087 fis; clone LNG06994; highly similar to AF161368 Homo sapiens HSPC105 mRNA	33.333333	0.00679025	0.655745	-1.52498	AF161368	Homo sapiens chromosome 16 clone RP11-510J16; complete sequence	AC092142	33.33333
PREDICTED: Canis familiaris similar to RAB GTPase activating protein 1-like; transcript variant 2 (LOC480064); mRNA	34.863946	0.000593008	0.655626	-1.52526	XM_856054	Human DNA sequence from clone RP1-102G20 on chromosome 1q24-25 Contains a novel pseudogene; two novel genes; a ribosomal protein S26 (RPS26) pseudogenem; the 3-prime end of the gene for expressed in hematopoietic cells (heart; liver) (HLL); the gene for Siah-interacting protein (SIP); the 3-prime end of the MRPS14 gene for mitochondrial ribosomal protein S14 and a CpG island; complete sequence	Z99127	33.84354
Macaca fascicularis mRNA; clone QmoA-14202: similar to Homo sapiens polymerase (RNA) III (DNA directed) polypeptide E (80kD) (POLR3E); mRNA; NM_018119.2	72.625698	0.0030886	0.654611	-1.52763	AB220484	Macaca fascicularis mRNA; clone QmoA-14202: similar to Homo sapiens polymerase (RNA) III (DNA directed) polypeptide E (80kD) (POLR3E); mRNA; NM_018119.2	AB220484	72.6257
PREDICTED: Canis familiaris similar to ATP-binding cassette; sub-family A ; member 5; transcript variant 6 (LOC480455); mRNA	91.588785	0.000204232	0.65392	-1.52924	XM_857754	Homo sapiens mRNA for KIAA1888 protein; partial cds	AB067475	89.01869
PREDICTED: Canis familiaris similar to TIA1 protein isoform 2; transcript variant 10 (LOC610625); mRNA	96.803653	0.00985574	0.652051	-1.53362	XM_861502	Human polyadenylate binding protein (TIA-1) mRNA; complete cds	M77142	94.97717
Homo sapiens nucleophosmin (nucleolar phosphoprotein B23; numatrin) (NPM1); transcript variant 1; mRNA	100	0.00155425	0.651184	-1.53567	BC008341	Homo sapiens cDNA clone IMAGE:3509098; **** WARNING: chimeric clone ****	BC008341	100
Felis catus PC4 and SFRS1 interacting	98.368298	0.00468202	0.648668	-	NM_001009372	Homo sapiens CLL-associated antigen	AF432220	89.04429

protein 1 (PSIP1); mRNA >gi|51847741|gb|AY705213.1| Felis catus lens epithelium derived growth factor p75 mRNA; complete cds				1.54162		KW-7 mRNA; complete cds		
Felis catus CD7 antigen (CD7); mRNA >gi|49022600|dbj|AB154850.1| Felis catus fCD7 mRNA for feline CD7; complete cds	100	2.48E-05	0.647573	-1.54423	NM_001009296	Homo sapiens clone FLH187866.01L; RZPDo839D12149D CD7 mRNA; partial sequence	DQ895810	15.71125
PREDICTED: Bos taurus similar to CG3304-PA (LOC505627); mRNA	21.398305	0.00145855	0.645247	-1.54979	CR859713	Homo sapiens chromosome 5 clone RP11-395C3; complete sequence	AC099513	20.97458
Human DNA sequence from clone RP11-82L9 on chromosome 10 Contains the 3-prime end of the DOCK1 gene for dedicator of cyto-kinesis 1; complete sequence		0.00964293	0.643036	-1.55512	XM_847484	Homo sapiens survival of motor neuron protein interacting protein 1 (SIP1); transcript variant alpha; mRNA	NM_003616	20.14011
PREDICTED: Pan troglodytes zinc finger protein 354A (ZNF354A); mRNA	20.773931	0.00323868	0.642126	-1.55733	XM_001140640	Homo sapiens zinc finger protein 354B; mRNA (cDNA clone MGC:132437 IMAGE:8143780); complete cds	BC104777	20.57027
Macaca fascicularis testis cDNA clone: QtsA-12474; similar to human M-phase phosphoprotein 11 (LOC402580); mRNA; RefSeq: XM_379909.1	95.591647	0.00222063	0.641487	-1.55888	AB168480	Macaca fascicularis testis cDNA clone: QtsA-12474; similar to human M-phase phosphoprotein 11 (LOC402580); mRNA; RefSeq: XM_379909.1	AB168480	95.59165
PREDICTED: Canis familiaris similar to Poly [ADP-ribose] polymerase-1 (PARP-1) (ADPRT) (NAD(+) ADP-ribosyltransferase-1) (Poly[ADP-ribose] synthetase-1); transcript variant 4 (LOC490385); mRNA	89.501779	0.00567886	0.64124	-1.55948	XM_858728	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Gamma enolase (2-phospho-D-glycerate hydro-lyase) (Neural enolase) (Neuron-specific enolase) (NSE) (Enolase 2); transcript variant 2 (LOC477709); mRNA	12.550607	0.000987345	0.640072	-1.56232	XM_534902	Homo sapiens BAC clone RP11-418H16 from 2; complete sequence	AC007389	6.07287
Homo sapiens mRNA for KIAA0594 protein; partial cds	27.331887	0.00915875	0.639189	-1.56448	AB011166	Homo sapiens mRNA for KIAA0594 protein; partial cds	AB011166	27.33189
PREDICTED: Macaca mulatta similar to Stretchin-Mlck CG18255-PA; isoform A; transcript variant 2 (LOC695054); mRNA	33.71869	0.00445813	0.638375	-1.56648	XM_001084251	Homo sapiens chromosome 12 open reading frame 35 (C12orf35); mRNA	NM_018169	29.47977
PREDICTED: Canis familiaris similar to Zinc finger protein 292 (LOC481908); mRNA	95.378928	0.00139366	0.638335	-1.56658	XM_539029	PREDICTED: Homo sapiens zinc finger protein 292; transcript variant 4 (ZNF292); mRNA	XM_938563	92.2366
PREDICTED: Canis familiaris similar to Heat-shock protein 105 kDa (Heat shock 110 kDa protein) (Antigen NY-	94.354839	0.00818438	0.636554	-1.57096	XM_534515	Homo sapiens clone FLH179452.01L; RZPDo839G09129D HSPH1 mRNA; partial sequence	DQ894904	92.74194

CO-25) (LOC477322); mRNA								
PREDICTED: Canis familiaris similar to cutaneous T-cell lymphoma tumor antigen se70-2; transcript variant 3 (LOC476955); mRNA	98.961938	0.00266899	0.635056	-1.57466	XM_844200	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Heat-shock protein 105 kDa (Heat shock 110 kDa protein) (Antigen NY-CO-25) (LOC477322); mRNA	93.150685	0.0081034	0.634778	-1.57535	XM_534515	Homo sapiens heat shock 105kDa/110kDa protein 1 (HSPH1); mRNA	NM_006644	88.81279
PREDICTED: Canis familiaris similar to zinc finger protein 258; transcript variant 3 (LOC612956); mRNA	97.04797	0.00466341	0.634168	-1.57687	XM_858983	Homo sapiens zinc finger; BED-type containing 5; mRNA (cDNA clone MGC:54149 IMAGE:6471771); complete cds	BC047754	94.64945
PREDICTED: Canis familiaris similar to basic leucine zipper and W2 domains 2; transcript variant 1 (LOC475250); mRNA	96.930946	0.00028323	0.628615	-1.5908	XM_532484	Homo sapiens clone FLH186853.01L; RZPDo839B0362D BZW2 mRNA; partial sequence	DQ895708	95.39642
PREDICTED: Pan troglodytes similar to Zinc finger CCCH-type containing 14 (LOC453092); mRNA	9.186352	0.000972554	0.628134	-1.59202	XM_612741	Homo sapiens putative NY-REN-37 antigen isoform 4 mRNA; complete cds; alternatively spliced	AY578063	9.18635
PREDICTED: Canis familiaris similar to C34C12.4; transcript variant 1 (LOC479105); mRNA	84.671533	0.00750428	0.627536	-1.59354	XM_536252	Homo sapiens chromosome 1 clone RP11-86H7; complete sequence	AC093117	78.10219
PREDICTED: Canis familiaris similar to DEK oncogene (DNA binding) (LOC610538); mRNA	63.752277	0.0020129	0.625464	-1.59881	XM_848066	Human chromosome 14 DNA sequence BAC R-248B24 of library RPCI-11 from chromosome 14 of Homo sapiens (Human); complete sequence	AL133373	30.23679
Felis catus BCL2B-cell CLL/lymphoma 2 (BCL2); mRNA >gi|25166610|dbj|AB096611.1| Felis catus mRNA for bcl-2 protein; complete cds	86.222222	0.000350779	0.625335	-1.59914	NM_001009340	Homo sapiens B-cell CLL/lymphoma 2 (BCL2); nuclear gene encoding mitochondrial protein; transcript variant alpha; mRNA	NM_000633	79.77778
PREDICTED: Canis familiaris similar to Selenoprotein P precursor (SeP); transcript variant 1 (LOC479346); mRNA	40.238095	0.000929008	0.624247	-1.60193	XM_862927	Homo sapiens selenoprotein P; plasma; 1 (SEPP1); mRNA	NM_005410	24.52381
PREDICTED: Canis familiaris similar to HCV NS5A-transactivated protein 9 (L5) (LOC610710); mRNA	88.070175	0.0055552	0.62368	-1.60339	XM_848253	Homo sapiens KIAA0101; mRNA (cDNA clone MGC:23764 IMAGE:4109322); complete cds	BC016782	19.82456
PREDICTED: Canis familiaris similar to DNA-binding protein SATB1 (Special AT-rich sequence binding protein 1) (LOC485650); mRNA	98.196393	0.00133019	0.622434	-1.6066	XM_542770	NULL	NULL	NA
PREDICTED: Canis familiaris similar to SH3 domain-binding protein 5 (SH3 domain-binding protein that	93.691589	0.000143766	0.621661	-1.60859	XM_542777	Synthetic construct Homo sapiens clone FLH190536.01X; RZPDo839B0576D SH3BP5 mRNA; complete sequence	DQ892875	91.35514

preferentially associates with BTK) (LOC485657); mRNA								
PREDICTED: Canis familiaris similar to RAN binding protein 5; transcript variant 2 (LOC485528); mRNA	88.581952	0.00317521	0.617008	-1.62072	XM_854438	Human DNA sequence from clone RP11-72J7 on chromosome 13q31.2-32.1 Contains the 3-prime end of the KPNB3 gene for karyopherin (importin) beta 3; complete sequence	AL137120	38.8582
PREDICTED: Canis familiaris similar to SWI/SNF related; matrix associated; actin dependent regulator of chromatin; subfamily e; member 1; transcript variant 8 (LOC608250); mRNA	94.047619	0.00516777	0.616446	-1.6222	XM_857912	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Zinc finger protein 265 (Zinc finger; splicing) (LOC490213); mRNA	97.281553	0.00135316	0.614987	-1.62605	XM_547334	Homo sapiens zinc finger; RAN-binding domain containing 2 (ZRANB2); transcript variant 1; mRNA	NM_203350	97.08738
PREDICTED: Pan troglodytes similar to UTP18 protein (LOC455135); mRNA	92.764378	0.00120332	0.610087	-1.63911	XR_024756	Homo sapiens UTP18; small subunit (SSU) processome component; homolog (yeast); mRNA (cDNA clone MGC:39182 IMAGE:4861495); complete cds	BC025276	92.57885
PREDICTED: Pan troglodytes hypothetical protein LOC737936 (LOC737936); mRNA	97.297297	0.00539076	0.608111	-1.64444	XR_020066	Homo sapiens chromosome 5 clone CTD-2265D6; complete sequence	AC093225	97.2973
PREDICTED: Canis familiaris similar to Single-stranded DNA-binding protein 2 (Sequence-specific single-stranded-DNA-binding protein 2); transcript variant 1 (LOC479160); mRNA	52.859961	0.00981624	0.604932	-1.65308	XM_536304	Macaca fascicularis brain cDNA; clone: QflA-12719; similar to human single-stranded DNA binding protein 2 (SSBP2); mRNA; RefSeq: NM_012446.2	AB169555	52.46548
Homo sapiens PC4 and SFRS1 interacting protein 1 (PSIP1); transcript variant 2; mRNA >gi|3283351|gb|AF063020.1|AF063020 Homo sapiens lens epithelium-derived growth factor mRNA; complete cds	86.310905	0.00020451	0.604892	-1.65319	NM_033222	Homo sapiens lens epithelium-derived growth factor gene; alternatively spliced; complete cds	AF199339	86.31091
PREDICTED: Canis familiaris similar to TIA1 protein isoform 2; transcript variant 10 (LOC610625); mRNA	93.262411	0.00206482	0.604788	-1.65347	XM_861502	Homo sapiens BAC clone RP11-175A7 from 2; complete sequence	AC016700	87.58865
Homo sapiens zinc finger protein 642 (ZNF642); mRNA	54.51448	0.000270517	0.604648	-1.65385	XM_599813	Human DNA sequence from clone RP11-656D10 on chromosome 1 Contains the gene for a novel zinc finger protein; the gene for a novel protein and three novel genes; complete sequence	AL603839	54.51448
PREDICTED: Canis familiaris similar to basic leucine zipper and W2 domains 2; transcript variant 1 (LOC475250); mRNA	62.146893	7.76E-05	0.603506	-1.65698	XM_857370	full-length cDNA clone CS0DI012YJ02 of Placenta Cot 25-normalized of Homo sapiens (human)	CR621525	61.01695

PREDICTED: Canis familiaris similar to Metaxin 2 (LOC478811); mRNA	96.624473	0.0037471	0.603007	-1.65836	XM_535974	Homo sapiens metaxin 2; mRNA (cDNA clone MGC:111067 IMAGE:30378040); complete cds	BC088359	85.65401
PREDICTED: Canis familiaris similar to Zinc finger protein 292 (LOC481908); mRNA	96.601942	0.000810683	0.602344	-1.66018	XM_539029	PREDICTED: Homo sapiens zinc finger protein 292; transcript variant 4 (ZNF292); mRNA	XM_938563	93.93204
Bos taurus similar to splicing factor p54 (MGC139252); mRNA >gi|109939969|gb|BC118154.1| Bos taurus similar to splicing factor p54; mRNA (cDNA clone MGC:139252 IMAGE:8206002); complete cds	40.689655	0.00123317	0.596847	-1.67547	NM_001075621	Human arginine-rich nuclear protein mRNA; complete cds	M74002	39.31035
PREDICTED: Homo sapiens hypothetical protein LOC731508 (LOC731508); mRNA	6.273063	0.00992204	0.596212	-1.67725	XM_001129896	Homo sapiens chromosome 5; P1 clone 207c2 (LBNL H33); complete sequence	AC004650	13.65314
Felis catus CD3 antigen epsilon (CD3E); mRNA >gi|56378114|dbj|AB195840.1| Felis catus cd3e mRNA for CD3 antigen epsilon subunit; complete cds; cell_type:thymocyte	83.159722	0.000581424	0.590272	-1.69413	NM_001009862	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Ubiquitin carboxyl-terminal hydrolase 1 (Ubiquitin thiolesterase 1) (Ubiquitin-specific processing protease 1) (Deubiquitinating enzyme 1) (hUBP); transcript variant 1 (LOC479549); mRNA	96.27907	0.0030461	0.586997	-1.70359	XM_536688	Homo sapiens ubiquitin specific peptidase 1 (USP1); transcript variant 1; mRNA	NM_003368	95.11628
PREDICTED: Canis familiaris similar to ataxia telangiectasia and Rad3 related protein; transcript variant 4 (LOC477101); mRNA	97.123894	0.00276107	0.585999	-1.70649	XM_860680	PREDICTED: Homo sapiens ataxia telangiectasia and Rad3 related (ATR); mRNA	XM_001131387	94.9115
PREDICTED: Canis familiaris similar to Interleukin-7 receptor alpha chain precursor (IL-7R-alpha) (CDw127) (CD127 antigen) (LOC612582); mRNA	85.988484	0.00595898	0.582375	-1.71711	XM_850315	PREDICTED: Homo sapiens interleukin 7 receptor (IL7R); mRNA	XM_001127146	55.85413
PREDICTED: Bos taurus similar to Interleukin 6 signal transducer (gp130; oncostatin M receptor) (LOC522155); mRNA	12.690355	0.000422493	0.579601	-1.72532	XM_001100601	Human Meis1-related protein 2 (MRG2); mRNA; partial cds	U68385	8.46024
PREDICTED: Canis familiaris similar to Protein C22orf8 (LOC481208); mRNA	48.101266	0.000747509	0.57799	-1.73013	XM_538329	Homo sapiens family with sequence similarity 118; member A; mRNA (cDNA clone MGC:8848 IMAGE:3860694); complete cds	BC013696	44.48463
PREDICTED: Canis familiaris similar to Nonhistone chromosomal protein	93.735499	0.000294192	0.577286	-1.73224	XM_844714	PREDICTED: Homo sapiens similar to Nonhistone chromosomal protein HMG-	XM_001132231	65.89327

HMG-14 (High-mobility group nucleosome binding domain 1); transcript variant 2 (LOC608119); mRNA						14 (High-mobility group nucleosome-binding domain-containing protein 1) (LOC728851); mRNA		
Felis catus mRNA for TCR alpha constant chain; partial cds	100	8.11E-05	0.57407	-1.74195	D89022	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Dihydropyrimidinase (DHPase) (Hydantoinase) (DHP); transcript variant 1 (LOC475067); mRNA	88.713911	0.00198608	0.57282	-1.74575	XM_532301	Homo sapiens dihydropyrimidinase (DPYS); mRNA >gi|2339965|dbj|D78011.1| Homo sapiens mRNA for dihydropyrimidinase; complete cds	NM_001385	36.48294
PREDICTED: Canis familiaris similar to Stathmin (Phosphoprotein p19) (pp19) (Oncoprotein 18) (Op18) (Leukemia-associated phosphoprotein p18) (pp17) (Prosolin) (Metablastin) (Pr22 protein); transcript variant 1 (LOC478175); mRNA	95.898438	0.00107038	0.571698	-1.74918	XM_535349	Macaca fascicularis testis cDNA; clone: QtsA-16615; similar to human stathmin 1/oncoprotein 18 (STMN1); transcript variant 3;mRNA; RefSeq: NM_005563.3	AB169018	92.96875
Homo sapiens mRNA; cDNA DKFZp686H1697 (from clone DKFZp686H1697)	27.293578	0.000661059	0.570125	-1.754	BX647547	Homo sapiens mRNA; cDNA DKFZp686H1697 (from clone DKFZp686H1697)	BX647547	27.29358
PREDICTED: Canis familiaris similar to SMC6 protein (LOC475675); mRNA	56.25	0.00160119	0.568846	-1.75795	XM_532882	Homo sapiens structural maintenance of chromosomes 6; mRNA (cDNA clone MGC:48735 IMAGE:5724409); complete cds	BC039828	54.32692
Felis catus CD8 antigen; beta polypeptide (CD8B); mRNA >gi|1794140|dbj|AB000484.1| Felis catus mRNA for CD8 beta antigen; complete cds	100	0.00160652	0.556946	-1.79551	NM_001009867	Homo sapiens CD8b molecule (CD8B); transcript variant 1; mRNA	NM_172099	75.19084
Felis catus clone E27 keratin 18 mRNA; partial cds	100	0.00116146	0.549202	-1.82082	AY662510	Homo sapiens clone FLH167528.01L; RZPDo839B1189D KRT18 mRNA; partial sequence	DQ893715	86.99187
PREDICTED: Pan troglodytes mucolipin 2 (MCOLN2); mRNA	18.458781	0.00320704	0.544895	-1.83522	XM_513523	Homo sapiens mucolipin 2 (MCOLN2); mRNA	NM_153259	12.72401
PREDICTED: Canis familiaris similar to DNA-binding protein SATB1 (Special AT-rich sequence binding protein 1) (LOC485650); mRNA	98.960499	0.000107709	0.542275	-1.84408	XM_542770	NULL	NULL	NA
PREDICTED: Pan troglodytes similar to profilin IIa (LOC460989); mRNA	97.336562	0.000932347	0.540383	-1.85054	XM_516998	Homo sapiens profilin 2 (PFN2); transcript variant 1; mRNA	NM_053024	97.33656
PREDICTED: Pan troglodytes dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 2; transcript variant 3 (DYRK2); mRNA	41.119221	0.00367644	0.532381	-1.87836	XM_001161394	Homo sapiens cDNA: FLJ21365 fis; clone COL03006; highly similar to HSY13493 Homo sapiens mRNA for protein kinase Dyrk2	AK025018	41.11922
PREDICTED: Canis familiaris similar to	72.103004	0.00116099	0.532176	-	XM_534487	Human PAX-3-FKHR gene fusion	U02308	65.23605

Forkhead box protein O1A (Forkhead in rhabdomyosarcoma) (LOC477295); mRNA				1.87908		mRNA; partial cds		
PREDICTED: Pan troglodytes hypothetical LOC465771; transcript variant 4 (LOC465771); mRNA	89.839572	0.000918909	0.498995	-2.00403	XM_521189	Homo sapiens G protein-coupled receptor associated sorting protein 2; mRNA (cDNA clone IMAGE:5271751)	BC051707	89.83957
PREDICTED: Canis familiaris similar to Dickkopf related protein-3 precursor (Dkk-3) (Dickkopf-3) (hDkk-3) (LOC476857); mRNA	77.099237	0.000232116	0.474822	-2.10605	XM_534060	Homo sapiens dickkopf-3 (DKK-3) mRNA; complete cds	AF177396	31.48855
PREDICTED: Canis familiaris similar to Tetraspanin-13 (Tspan-13) (Transmembrane 4 superfamily member 13) (Tetraspan NET-6) (LOC482332); mRNA	89.830508	0.000861772	0.471024	-2.12304	XM_539449	full-length cDNA clone CS0DI065YG03 of Placenta Cot 25-normalized of Homo sapiens (human)	CR602288	50.84746
PREDICTED: Pan troglodytes similar to cytokeratin 18 (424 AA) (LOC451924); mRNA	87.234043	0.000834521	0.397539	-2.51548	XR_025386	Homo sapiens BAC clone RP11-357C22 from Y; complete sequence	AC012667	87.23404
Homo sapiens GPBP; DINB1 genes for Thr/Ser kinase; DINB1; partial cds	18.055556	0.000268377	0.385653	-2.593	AB036934	Homo sapiens chromosome 8; clone CTD-3107M8; complete sequence	AC109329	46.8254

FIGURE 5 p value < 0.01 FC >1.5

Top-Blast-Annot	Top-Match%.	P-value	Mean-Ratio	Fold-Change	Top-Accn	Hum-Annot	Hum-Id	Hum-Match%
PREDICTED: Homo sapiens hypothetical protein LOC731508 (LOC731508); mRNA	6.273063	0.00992204	0.596212	-1.67725	XM_001129896	Homo sapiens chromosome 5; P1 clone 207c2 (LBNL H33); complete sequence	AC004650	13.65314
PREDICTED: Canis familiaris similar to TIA1 protein isoform 2; transcript variant 10 (LOC610625); mRNA	96.803653	0.00985574	0.652051	-1.53362	XM_861502	Human polyadenylate binding protein (TIA-1) mRNA; complete cds	M77142	94.97717
PREDICTED: Pan troglodytes DIP13 beta; transcript variant 3 (LOC452197); mRNA	30.946882	0.00982949	0.715769	-1.3971	XM_001160702	Homo sapiens DIP13 beta; mRNA (cDNA clone MGC:45069 IMAGE:5168590); complete cds	BC033731	30.94688
PREDICTED: Canis familiaris similar to AFG3-like protein 2 (Paraplegin-like protein) (LOC490560); mRNA	86.700767	0.00982755	0.736356	-1.35804	XM_547682	Homo sapiens mRNA similar to tubulin beta-5 (cDNA clone IMAGE:5745167)	BC039717	8.18414
PREDICTED: Canis familiaris similar to Single-stranded DNA-binding protein 2 (Sequence-specific single-stranded-DNA-binding protein 2); transcript variant 1 (LOC479160); mRNA	52.859961	0.00981624	0.604932	-1.65308	XM_536304	Macaca fascicularis brain cDNA; clone: QflA-12719; similar to human single-stranded DNA binding protein 2 (SSBP2); mRNA; RefSeq: NM_012446.2	AB169555	52.46548
PREDICTED: Macaca mulatta beta chimerin (CHN2); mRNA	27.368421	0.00980799	0.694123	-1.44067	XM_001088070	Macaca fascicularis brain cDNA; clone:QnpA-16415; similar to human chimerin2 (CHN2); mRNA; NM_004067.1	AB049846	27.36842
PREDICTED: Canis familiaris similar to 14-3-3 protein theta (14-3-3 protein tau); transcript variant 3 (LOC607060); mRNA	92.514395	0.00971883	0.768544	-1.30116	XM_851129	Homo sapiens tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein; theta polypeptide; mRNA (cDNA clone MGC:3173 IMAGE:3355691); complete cds	BC001197	81.76584
PREDICTED: Canis familiaris similar to CCAAT/enhancer binding protein zeta; transcript variant 2 (LOC483035); mRNA	93.594306	0.00966683	0.671419	-1.48938	XM_858367	Homo sapiens CCAAT/enhancer binding protein zeta (CEBPZ); mRNA	NM_005760	88.6121
		0.00964293	0.643036	-1.55512	XM_847484	Homo sapiens survival of motor neuron protein interacting protein 1 (SIP1); transcript variant alpha; mRNA	NM_003616	20.14011
Homo sapiens survival of motor neuron protein interacting protein 1 (SIP1); transcript variant alpha; mRNA	20.140105	0.00958205	0.764075	-1.30877	XM_847484	Homo sapiens survival of motor neuron protein interacting protein 1 (SIP1); transcript variant alpha; mRNA	NM_003616	20.14011
PREDICTED: Canis familiaris similar to acyl-Coenzyme A binding domain containing 6 (LOC480029); mRNA	92.227979	0.00941283	0.746523	-1.33954	XM_537152	full-length cDNA clone CS0DL011YJ12 of B cells (Ramos cell line) Cot 25-normalized of Homo sapiens (human)	CR626583	77.5475
PREDICTED: Canis familiaris similar to Matrin 3; transcript variant 14 (LOC474700); mRNA	97.560976	0.00935014	0.711684	-1.40512	XM_859179	NULL	NULL	NA
PREDICTED: Bos taurus hypothetical LOC538086; transcript variant 2	89.003436	0.00931677	0.729921	-1.37001	XM_618279	Homo sapiens cDNA FLJ10929 fis; clone OVARC1000479; highly similar to Homo	AK001791	62.37113

(LOC538086); mRNA						sapiens mRNA for KIAA0829 protein		
Mus musculus LTV1 homolog (S. cerevisiae) (Ltv1); mRNA >gi|12847648|dbj|AK011491.1| Mus musculus 10 days embryo whole body cDNA; RIKEN full-length enriched library; clone:2610020N02 product:SIMILAR TO NUCLEOLIN homolog [Homo sapiens]; full insert sequence	29.359431	0.00916156	0.766395	-1.30481	NM_181470	Human DNA sequence from clone RP3-468K18 on chromosome 6q24.1-24.3 Contains part of the gene for a novel protein (contains KIAA0680); the gene for a novel protein (similar to nucleolin) (contains FLJ14909); the gene for a novel protein similar to a hypothetical mouse protein; and part of the PLAGL1 gene for pleiomorphic adenoma gene-like 1 (PLAG-like 1; LOT1; ZAC; ZAC tumor suppressor). Contains a CpG island; complete sequence	AL049844	32.02847
Homo sapiens mRNA for KIAA0594 protein; partial cds	27.331887	0.00915875	0.639189	-1.56448	AB011166	Homo sapiens mRNA for KIAA0594 protein; partial cds	AB011166	27.33189
PREDICTED: Pan troglodytes complement component 3a receptor 1; transcript variant 3 (C3AR1); mRNA	89.325843	0.0091316	1.32863	1.32863	XM_522342	full-length cDNA clone CS0DI016YJ19 of Placenta Cot 25-normalized of Homo sapiens (human)	CR623914	89.13858
PREDICTED: Canis familiaris similar to glucosamine-6-phosphate deaminase 2; transcript variant 1 (LOC608049); mRNA	90.184049	0.0090918	0.7067	-1.41503	XM_853644	Homo sapiens putative glucosamine-6-phosphate isomerase mRNA; complete cds	AY173948	47.64826
PREDICTED: Canis familiaris similar to eukaryotic translation elongation factor 1 delta; transcript variant 1 (LOC475115); mRNA	89.183673	0.00908905	0.700844	-1.42685	XM_532345	NULL	NULL	NA
PREDICTED: Canis familiaris similar to mitochondrial ribosomal protein L14 (LOC474918); mRNA	86.099585	0.00907169	0.754545	-1.3253	XM_532153	full-length cDNA clone CS0DD006YJ18 of Neuroblastoma Cot 50-normalized of Homo sapiens (human)	CR625056	81.95021
PREDICTED: Canis familiaris similar to solute carrier family 38; member 2 (LOC486596); mRNA	95.183044	0.00906176	0.735134	-1.3603	XM_543722	Homo sapiens solute carrier family 38; member 2 (SLC38A2); mRNA >gi|25955654|gb|BC040342.1| Homo sapiens solute carrier family 38; member 2; mRNA (cDNA clone MGC:8808 IMAGE:3874551); complete cds	NM_018976	88.63199
PREDICTED: Canis familiaris similar to microtubule-associated protein; RP/EB family; member 3; transcript variant 10 (LOC475694); mRNA	94.279176	0.00904561	1.67324	1.67324	XM_855042	NULL	NULL	NA
Macaca fascicularis brain cDNA clone: QmoA-12364; similar to human B lymphoma Mo-MLV insertion region (mouse) (BMI1); mRNA; RefSeq: NM_005180.5	92.405063	0.0090103	0.693543	-1.44187	XM_001135998	Homo sapiens B lymphoma Mo-MLV insertion region (mouse) (BMI1); mRNA >gi|39644532|gb|BC011652.2| Homo sapiens B lymphoma Mo-MLV insertion region (mouse); mRNA (cDNA clone MGC:12685 IMAGE:4138748); complete cds	NM_005180	91.77215

Bos taurus similar to estrogen receptor-binding fragment-associated gene 9 (LOC538551); mRNA >gi|112362134|gb|BC120398.1| Bos taurus similar to estrogen receptor-binding fragment-associated gene 9; mRNA (cDNA clone MGC:142970 IMAGE:8315661); complete cds	85.477941	0.00900235	0.717943	-1.39287	BC120398	Homo sapiens estrogen receptor binding site associated; antigen; 9; mRNA (cDNA clone MGC:21461 IMAGE:3453385); complete cds	BC017729	69.66912
Homo sapiens crystallin; zeta (quinone reductase)-like 1; mRNA (cDNA clone MGC:32911 IMAGE:5269248); complete cds	51.554404	0.00895977	0.741224	-1.34912	BC033023	Homo sapiens quinone oxidoreductase homolog-1 mRNA; complete cds	AF029689	51.5544
PREDICTED: Canis familiaris similar to Heterogeneous nuclear ribonucleoprotein A1 (Helix-destabilizing protein) (Single-strand binding protein) (hnRNP core protein A1) (HDP-1) (Topoisomerase-inhibitor suppressed); transcript variant 1 (LOC477592); mRNA	95.167286	0.00893536	0.734752	-1.361	XM_534786	NULL	NULL	NA
PREDICTED: Canis familiaris similar to nuclear factor (erythroid-derived 2)-like 2; transcript variant 2 (LOC478813); mRNA	51.836735	0.00884367	1.32451	1.32451	XM_857112	Nrf2=NF-E2-like basic leucine zipper transcriptional activator [human; hemin-induced K562 cells; mRNA; 2304 nt]	S74017	47.34694
PREDICTED: Canis familiaris similar to polyribonucleotide nucleotidyltransferase 1; transcript variant 1 (LOC481376); mRNA	95.203837	0.00879834	0.6794	-1.47189	XM_538497	Homo sapiens polyribonucleotide nucleotidyltransferase 1 (PNPT1); mRNA >gi|31657165|gb|BC053660.1| Homo sapiens polyribonucleotide nucleotidyltransferase 1; mRNA (cDNA clone MGC:61565 IMAGE:6062060); complete cds	NM_033109	91.60672
PREDICTED: Bos taurus hypothetical protein LOC787342 (LOC787342); mRNA	88.036117	0.0087753	0.66229	-1.50991	NM_001075429	full-length cDNA clone CS0DF016YH11 of Fetal brain of Homo sapiens (human)	CR595568	52.3702
Bos taurus armadillo repeat containing 2 (LOC767841); mRNA >gi|92096622|gb|BC114723.1| Bos taurus armadillo repeat containing 2; mRNA (cDNA clone MGC:137870 IMAGE:8080178); complete cds	91.756272	0.00867467	0.759649	-1.3164	BC114723	Homo sapiens armadillo repeat containing; X-linked 2 (ARMCX2); mRNA	NM_014782	90.86022
PREDICTED: Canis familiaris similar to cisplatin resistance related protein CRR9p; transcript variant 3 (LOC478630); mRNA	53.271028	0.00866405	0.768482	-1.30127	XM_851519	full-length cDNA clone CS0DK012YL07 of HeLa cells Cot 25-normalized of Homo sapiens (human)	CR592270	28.03738
PREDICTED: Canis familiaris similar to selenoprotein N; 1 isoform 2 precursor	93.939394	0.00862369	1.51967	1.51967	XM_849947	Homo sapiens selenoprotein N; 1 (SEPN1); transcript variant 2; mRNA	NM_206926	90.90909

(LOC612211); mRNA								
PREDICTED: Pan troglodytes X-ray repair complementing defective repair in Chinese hamster cells 5 (double-strand-break rejoining; Ku autoantigen; 80kDa); transcript variant 2 (XRCC5); mRNA	69.860627	0.00854094	0.675196	-1.48105	XM_001151488	Human Ku (p70/p80) subunit mRNA; complete cds	M30938	69.86063
Sus scrofa mRNA; clone:LNG010022G06; expressed in lung	46.46098	0.00847275	0.750019	-1.3333	AK231782	Homo sapiens phospholipase A1 member A; mRNA (cDNA clone MGC:51964 IMAGE:6061929); complete cds	BC047703	45.55354
PREDICTED: Canis familiaris similar to inosine 5-phosphate dehydrogenase 2; transcript variant 8 (LOC476630); mRNA	95.278246	0.00839151	0.658905	-1.51767	XM_857781	NULL	NULL	NA
PREDICTED: Canis familiaris similar to RNA-binding protein 10 (RNA binding motif protein 10) (DXS8237E); transcript variant 1 (LOC480895); mRNA	93.473193	0.00832004	0.738971	-1.35323	XM_538013	Homo sapiens mRNA for RNA-binding protein 10 variant; clone: CBR06542	AK225175	69.93007
PREDICTED: Canis familiaris similar to glyoxylase 1 (LOC474894); mRNA	91.666667	0.00831542	0.708921	-1.4106	XM_532129	full-length cDNA clone CS0DN005YE19 of Adult brain of Homo sapiens (human)	CR615049	55.47619
PREDICTED: Canis familiaris similar to Heat-shock protein 105 kDa (Heat shock 110 kDa protein) (Antigen NY-CO-25) (LOC477322); mRNA	94.354839	0.00818438	0.636554	-1.57096	XM_534515	Homo sapiens clone FLH179452.01L; RZPDo839G09129D HSPH1 mRNA; partial sequence	DQ894904	92.74194
PREDICTED: Pan troglodytes hypothetical LOC465018 (KLHL9); mRNA	33.788396	0.0081628	0.705301	-1.41783	XM_520510	Homo sapiens mRNA for KIAA1354 protein; partial cds	AB037775	23.89079
PREDICTED: Canis familiaris pyruvate kinase M; transcript variant 3 (PKM2); mRNA	33.333333	0.00811334	1.43712	1.43712	XM_535531	Homo sapiens chromosome 8; clone RP11-410F13; complete sequence	AC105218	15.90414
PREDICTED: Canis familiaris similar to Heat-shock protein 105 kDa (Heat shock 110 kDa protein) (Antigen NY-CO-25) (LOC477322); mRNA	93.150685	0.0081034	0.634778	-1.57535	XM_534515	Homo sapiens heat shock 105kDa/110kDa protein 1 (HSPH1); mRNA	NM_006644	88.81279
PREDICTED: Pan troglodytes similar to AZI2 protein; transcript variant 6 (LOC460239); mRNA	33.915212	0.00809588	0.716049	-1.39655	XM_001166351	Homo sapiens 5-azacytidine induced 2 (AZI2); mRNA	NM_022461	12.7182
PREDICTED: Pan troglodytes matrin 3; transcript variant 13 (MATR3); mRNA	97.358491	0.00808998	0.699887	-1.4288	XM_001172359	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Calcyclin-binding protein (CacyBP) (hCacyBP) (Siah-interacting protein) (S100A6-binding protein) (LOC480062); mRNA	92.898273	0.00808831	0.766988	-1.3038	XM_537183	Homo sapiens PNAS-107 mRNA; complete cds	AF275803	88.09981
PREDICTED: Canis familiaris similar to SMC5 protein; transcript variant 1	67.052023	0.00792577	0.749972	-1.33338	XM_533529	Homo sapiens clone FLH196617.01L; RZPDo839F11155D SMC5 mRNA; partial	DQ896768	63.96917

(LOC476327); mRNA						sequence		
PREDICTED: Bos taurus histidine acid phosphatase domain containing 1 (HISPPD1); mRNA	41.972921	0.00790407	0.750725	-1.33205	XM_001137949	full-length cDNA clone CS0DB003YP21 of Neuroblastoma Cot 10-normalized of Homo sapiens (human)	CR597259	12.37911
PREDICTED: Canis familiaris similar to CG6004-PB (LOC477650); mRNA	83.967936	0.00784868	0.685542	-1.4587	XM_534845	Homo sapiens chromosome 12 open reading frame 35; mRNA (cDNA clone IMAGE:40024087); partial cds	BC114509	59.31864
Felis catus survival of motor neuron (SMN); mRNA >gi|27447275|gb|AY094503.1| Felis catus survival of motor neuron (SMN) mRNA; complete cds	100	0.00781636	0.716027	-1.39659	NM_001009328	Homo sapiens survival of motor neuron 1; telomeric (SMN1); transcript variant d; mRNA	NM_000344	46.61654
PREDICTED: Canis familiaris similar to CG7382-PA; transcript variant 2 (LOC476170); mRNA	44.652908	0.0077319	0.743841	-1.34437	XM_843471	Homo sapiens clone FLH169628.01L; RZPDo839E0695D C18orf55 mRNA; partial sequence	DQ894314	41.08818
Sus scrofa mRNA; clone:OVRM10032A09; expressed in ovary	15.697674	0.0076167	0.752628	-1.32868	AK234920	Homo sapiens oxysterol binding protein 2 (OSBP2) gene; complete cds	AF288742	4.45736
PREDICTED: Bos taurus similar to RNA U; small nuclear RNA export adaptor (phosphorylation regulated) (LOC507478); mRNA	39.586919	0.00753792	0.720324	-1.38826	XM_584089	Homo sapiens cDNA FLJ14003 fis; clone Y79AA1002311; moderately similar to R.norvegicus mRNA for cytosolic resiniferatoxin-binding protein	AK024065	20.13769
PREDICTED: Canis familiaris similar to C34C12.4; transcript variant 1 (LOC479105); mRNA	84.671533	0.00750428	0.627536	-1.59354	XM_536252	Homo sapiens chromosome 1 clone RP11-86H7; complete sequence	AC093117	78.10219
PREDICTED: Canis familiaris similar to CTL2 protein; transcript variant 2 (LOC484951); mRNA	94.067797	0.00750031	1.41286	1.41286	XM_863073	Homo sapiens CTL2 gene	AJ245621	89.32203
PREDICTED: Canis familiaris similar to RNA cyclase homolog (LOC484183); mRNA	90.948276	0.00741478	1.33101	1.33101	XM_541299	Homo sapiens RNA terminal phosphate cyclase-like 1; mRNA (cDNA clone MGC:1390 IMAGE:3343468); complete cds	BC001025	87.93103
PREDICTED: Canis familiaris similar to Hermansky-Pudlak syndrome 4 protein (Light-ear protein homolog); transcript variant 1 (LOC486330); mRNA	85.224274	0.00730009	1.38631	1.38631	XM_543456	Homo sapiens Hermansky-Pudlak syndrome 4 (HPS4); transcript variant 1; mRNA	NM_022081	82.8496
PREDICTED: Canis familiaris similar to Trifunctional purine biosynthetic protein adenosine-3 (LOC609892); mRNA	24.375	0.00727029	0.74956	-1.33412	XM_847240	Homo sapiens phosphoribosylglycinamide formyltransferase; phosphoribosylglycinamide synthetase; phosphoribosylaminoimidazole synthetase (GART); transcript variant 1; mRNA	NM_000819	21.04167
PREDICTED: Canis familiaris similar to retinoblastoma binding protein 7; transcript variant 4 (LOC480854); mRNA	95.010846	0.00725322	0.751521	-1.33064	XM_852758	NULL	NULL	NA
PREDICTED: Canis familiaris similar to	92.671395	0.00720523	0.723496	-	XM_536294	Homo sapiens KIAA0372; mRNA (cDNA	BC015163	90.07092

CG8777-PA (LOC479150); mRNA				1.38218		clone IMAGE:3889120); partial cds		
PREDICTED: Canis familiaris similar to zinc finger; CCHC domain containing 9; transcript variant 3 (LOC479161); mRNA	47.142857	0.00710377	0.743516	-1.34496	XM_854231	Homo sapiens zinc finger; CCHC domain containing 9; mRNA (cDNA clone IMAGE:3029564); partial cds	BC022799	40.35714
PREDICTED: Pan troglodytes hypothetical protein LOC461523; transcript variant 2 (LOC461523); mRNA	78.33002	0.00707155	0.719606	-1.38965	XM_517465	Homo sapiens ATP-binding cassette; sub-family E (OABP); member 1 (ABCE1); transcript variant 2; mRNA	NM_001040876	77.53479
PREDICTED: Canis familiaris phosphorylase; glycogen; liver; transcript variant 1 (PYGL); mRNA	92.339545	0.0069456	1.40167	1.40167	XM_537443	Homo sapiens phosphorylase; glycogen; liver (Hers disease; glycogen storage disease type VI) (PYGL); mRNA	NM_002863	90.47619
PREDICTED: Canis familiaris similar to acetyl-CoA synthetase 2-like (LOC477002); mRNA	63.864043	0.0069013	1.32013	1.32013	XM_534200	NULL	NULL	NA
PREDICTED: Pan troglodytes vasculin; transcript variant 2 (GPBP1); mRNA	16.216216	0.00689041	0.698993	-1.43063	XM_001141666	Homo sapiens chromosome 5 clone CTC-326G7; complete sequence	AC008435	16.21622
PREDICTED: Canis familiaris similar to recombining binding protein suppressor of hairless isoform 4; transcript variant 1 (LOC479122); mRNA	95.373665	0.00688209	1.31984	1.31984	XM_536269	NULL	NULL	NA
Homo sapiens cDNA: FLJ23087 fis; clone LNG06994; highly similar to AF161368 Homo sapiens HSPC105 mRNA	33.333333	0.00679025	0.655745	-1.52498	AF161368	Homo sapiens chromosome 16 clone RP11-510J16; complete sequence	AC092142	33.33333
Macaca fascicularis brain cDNA clone: QflA-18961; similar to human cysteine-rich motor neuron 1 (CRIM1); mRNA; RefSeq: NM_016441.1	40.892857	0.00670688	0.70494	-1.41856	XM_582692	Homo sapiens cysteine rich transmembrane BMP regulator 1 (chordin-like) (CRIM1); mRNA >gi|6979310|gb|AF167706.1|AF167706 Homo sapiens cysteine-rich repeat-containing protein S52 precursor; mRNA; complete cds	NM_016441	40.53571
PREDICTED: Canis familiaris similar to CG1120-PA; transcript variant 2 (LOC475565); mRNA	73.369565	0.00669622	0.679271	-1.47217	XM_843167	Homo sapiens mRNA; cDNA DKFZp667A053 (from clone DKFZp667A053)	AL442078	70.1087
PREDICTED: Canis familiaris mutS-like protein 2; transcript variant 1 (MSH2); mRNA	97.402597	0.00668508	0.740173	-1.35104	XM_538482	Homo sapiens clone FLH187491.01L; RZPDo839H1162D MSH2 mRNA; partial sequence	DQ895772	93.76623
PREDICTED: Canis familiaris similar to RIKEN cDNA 0610040D20 (LOC476550); mRNA	42.21219	0.0065751	0.758295	-1.31875	XM_533756	Homo sapiens hypothetical protein HSPC148 (HSPC148); mRNA >gi|6841517|gb|AF161497.1|AF161497 Homo sapiens HSPC148 mRNA; complete cds	NM_016403	40.63205
PREDICTED: Canis familiaris p97 homologous protein (P97); mRNA	94.578313	0.00637385	0.684851	-1.46017	XM_546829	Homo sapiens craniofacial development protein 1; mRNA (cDNA clone MGC:5126 IMAGE:3449836); complete cds	BC000991	90.96386

Equus caballus heat shock protein 90 (Hsp90) mRNA; complete cds	93.702771	0.00636285	0.730991	-1.36801	AY383484	Macaca fascicularis brain cDNA; clone: QccE-21185; similar to human heat shock 90kDa protein 1; beta (HSPCB); mRNA; RefSeq: NM_007355.2	AB169809	91.43577
Sus scrofa growth arrest and DNA-damage-inducible protein alpha (GADD45A); mRNA >gi|108795322|gb|DQ529285.1| Sus scrofa growth arrest and DNA-damage-inducible protein alpha (GADD45A) mRNA; complete cds	93.530499	0.00630759	1.40553	1.40553	NM_001044599	Human DNA sequence from clone RP5-975D15 on chromosome 1p31.3-32.2 Contains the GADD45A gene for growth arrest and DNA-damage-inducible alpha; the 3-prime end of the GNG12 gene for guanine nucleotide binding protein (G protein) gamma 12 and a CpG island; complete sequence	AL136120	92.97597
PREDICTED: Canis familiaris similar to DnaJ (Hsp40) homolog; subfamily C; member 2 isoform 2; transcript variant 2 (LOC483275); mRNA	94.572025	0.00621863	0.690628	-1.44796	XM_540394	Homo sapiens zuotin related factor 1 (ZRF1); mRNA	NM_014377	92.48434
PREDICTED: Canis familiaris similar to Mediator complex subunit 4 (Mediator of RNA polymerase II transcription subunit 4) (Vitamin D3 receptor-interacting protein complex 36 kDa component) (DRIP36) (Activator-recruited cofactor 36 kDa component) (ARC36) (TRAP/SMCC/PC2 subunit... (LOC476917); mRNA	33.213645	0.00612946	0.760618	-1.31472	XM_534120	Homo sapiens HSPC126 mRNA; complete cds	AF161475	25.13465
PREDICTED: Canis familiaris similar to Interleukin-7 receptor alpha chain precursor (IL-7R-alpha) (CDw127) (CD127 antigen) (LOC612582); mRNA	85.988484	0.00595898	0.582375	-1.71711	XM_850315	PREDICTED: Homo sapiens interleukin 7 receptor (IL7R); mRNA	XM_001127146	55.85413
PREDICTED: Canis familiaris similar to microfilament and actin filament cross-linker protein isoform a; transcript variant 1 (LOC475321); mRNA	61.309524	0.00594443	0.691207	-1.44674	XM_532549	Homo sapiens microtubule-actin crosslinking factor 1; mRNA (cDNA clone IMAGE:6497156); partial cds	BC071925	58.53175
Sus scrofa clone Clu_5617.scr.msk.p1.Contig3; mRNA sequence	9.542744	0.00588028	0.768106	-1.3019	AY610017	Homo sapiens 3 BAC RP11-95L3 (Roswell Park Cancer Institute Human BAC Library) complete sequence	AC079863	10.33797
PREDICTED: Bos taurus similar to sentrin-specific protease SENP6 (LOC533853); mRNA	92.71028	0.00582073	0.7556	-1.32345	XM_613393	Homo sapiens SUMO1/sentrin specific peptidase 6; mRNA (cDNA clone MGC:26784 IMAGE:4838569); complete cds	BC028583	88.59813
PREDICTED: Pan troglodytes nuclear receptor subfamily 3; group C; member 2; transcript variant 2 (NR3C2); mRNA	47.005445	0.00581773	0.702131	-1.42423	XM_001150383	Homo sapiens BAC clone RP11-635A1 from 4; complete sequence	AC093678	46.64247
Equus caballus LPS-induced TNF-alpha factor (LITAF) mRNA; complete cds	19.864177	0.00581078	1.47349	1.47349	AF503366	Homo sapiens lipopolysaccharide-induced TNF factor; mRNA (cDNA clone IMAGE:3506981); containing frame-shift	BC000053	5.94228

						errors		
PREDICTED: Canis familiaris similar to Calpain-1 catalytic subunit (Calpain-1 large subunit) (Calcium-activated neutral proteinase 1) (CANP 1) (Calpain mu-type) (muCANP) (Micromolar-calpain); transcript variant 1 (LOC483745); mRNA	94.959677	0.00577419	1.37695	1.37695	XM_540866	Macaca fascicularis brain cDNA; clone: QccE-12457; similar to human calpain 1; (mu/I) large subunit (CAPN1); mRNA; RefSeq: NM_005186.2	AB169651	91.33065
PREDICTED: Canis familiaris similar to Poly [ADP-ribose] polymerase-1 (PARP-1) (ADPRT) (NAD(+) ADP-ribosyltransferase-1) (Poly[ADP-ribose] synthetase-1); transcript variant 4 (LOC490385); mRNA	89.501779	0.00567886	0.64124	-1.55948	XM_858728	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Superoxide dismutase [Mn]; mitochondrial precursor; transcript variant 4 (LOC476258); mRNA	94.117647	0.005668	1.76071	1.76071	XM_857493	Homo sapiens cDNA FLJ40076 fis; clone TESTI2000874; highly similar to SUPEROXIDE DISMUTASE [MN]; MITOCHONDRIAL PRECURSOR (EC 1.15.1.1)	AK097395	73.62429
PREDICTED: Bos taurus similar to DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide RIG-I; transcript variant 1 (LOC504760); mRNA	86.550976	0.00563556	1.56731	1.56731	XM_580928	Homo sapiens DEAD (Asp-Glu-Ala-Asp) box polypeptide 58 (DDX58); mRNA	NM_014314	81.3449
Canis familiaris CD163 molecule (CD163); mRNA >gi|70609864|gb|DQ060837.1| Canis familiaris CD163v3 mRNA; complete cds	92.641509	0.00559955	1.30909	1.30909	NM_001048020	NULL	NULL	NA
PREDICTED: Pan troglodytes CAS1 domain containing 1; transcript variant 2 (CASD1); mRNA	58.454106	0.0055809	0.75292	-1.32816	XM_001169008	Homo sapiens CAS1 domain containing 1 (CASD1); mRNA >gi|38648759|gb|BC063284.1| Homo sapiens CAS1 domain containing 1; mRNA (cDNA clone MGC:71559 IMAGE:5286382); complete cds	NM_022900	57.48792
PREDICTED: Canis familiaris similar to HCV NS5A-transactivated protein 9 (L5) (LOC610710); mRNA	88.070175	0.0055552	0.62368	-1.60339	XM_848253	Homo sapiens KIAA0101; mRNA (cDNA clone MGC:23764 IMAGE:4109322); complete cds	BC016782	19.82456
Felis catus clone vb3 T-cell receptor beta chain mRNA; partial cds	100	0.00552898	0.681104	-1.46821	AY316129	Homo sapiens clone J3N.5 T cell receptor beta chain mRNA; complete cds	DQ341459	63.83648
PREDICTED: Canis familiaris similar to Ubiquitin carboxyl-terminal hydrolase 10 (Ubiquitin thiolesterase 10) (Ubiquitin-specific processing protease 10) (Deubiquitinating enzyme 10) (LOC479625); mRNA	89.873418	0.00549499	0.736629	-1.35753	XM_536761	Homo sapiens clone FLH187413.01L; RZPDo839H0162D USP10 mRNA; partial sequence	DQ895764	88.18565
PREDICTED: Canis familiaris similar to	80.299786	0.00539427	0.762322	-	XM_532710	Homo sapiens cDNA clone	BC017418	76.23126

CG15027-PA (LOC475487); mRNA				1.31178		IMAGE:4672457; partial cds		
PREDICTED: Pan troglodytes hypothetical protein LOC737936 (LOC737936); mRNA	97.297297	0.00539076	0.608111	-1.64444	XR_020066	Homo sapiens chromosome 5 clone CTD-2265D6; complete sequence	AC093225	97.2973
Felis catus toll-like receptor 4 (TLR4); mRNA >gi|13810544|dbj|AB060687.1| Felis catus mRNA for Toll-like receptor 4; complete cds	100	0.00533979	1.52344	1.52344	NM_001009223	NULL	NULL	NA
PREDICTED: Canis familiaris similar to retinoblastoma-binding protein 6 isoform 3; transcript variant 6 (LOC479802); mRNA	56.498674	0.0052768	0.717796	-1.39315	XM_845141	NULL	NULL	NA
PREDICTED: Pan troglodytes alpha 1 type XV collagen; transcript variant 2 (COL15A1); mRNA	36.862004	0.00527381	1.36328	1.36328	XM_001159050	Human DNA sequence from clone RP11-192E23 on chromosome 9 Contains the 3-prime end of the COL15A1 gene for collagen type XV and a CpG island; complete sequence	AL354923	36.862
PREDICTED: Canis familiaris similar to Protein C10orf86 (LOC477849); mRNA	94.478528	0.00517493	0.666263	-1.50091	XM_535041	Homo sapiens mRNA for chromosome 10 open reading frame 86 variant; clone: adKA01794	AK222487	86.19632
PREDICTED: Canis familiaris similar to SWI/SNF related; matrix associated; actin dependent regulator of chromatin; subfamily e; member 1; transcript variant 8 (LOC608250); mRNA	94.047619	0.00516777	0.616446	-1.6222	XM_857912	NULL	NULL	NA
PREDICTED: Canis familiaris similar to ubiquitin specific protease 16 isoform a; transcript variant 2 (LOC478398); mRNA	47.058824	0.00515912	0.724458	-1.38034	XM_843237	Macaca fascicularis testis cDNA; clone: QtsA-16913; similar to human ubiquitin specific protease 16 (USP16); mRNA; RefSeq: NM_006447.1	AB169053	45.65826
PREDICTED: Canis familiaris similar to transcription factor-like 5 protein (LOC612441); mRNA	54.020619	0.00514264	0.733359	-1.36359	XM_850169	Homo sapiens transcription factor-like 5 (basic helix-loop-helix) (TCFL5); mRNA	NM_006602	24.53608
Pongo pygmaeus mRNA; cDNA DKFZp459M0218 (from clone DKFZp459M0218)	83.022071	0.00513109	0.690255	-1.44874	CR861012	Homo sapiens cDNA FLJ31524 fis; clone NT2RI2000284; moderately similar to Homo sapiens AMSH mRNA	AK056086	82.85229
Bos taurus radixin (RDX); mRNA >gi|81673082|gb|BC109485.1| Bos taurus radixin; mRNA (cDNA clone MGC:128776 IMAGE:7988858); complete cds	21.22905	0.00509002	0.672109	-1.48785	NM_001075749	Homo sapiens chromosome 11; clone RP11-23F23; complete sequence	AC015689	19.36685
PREDICTED: Canis familiaris similar to C1q domain containing 1 isoform 3; transcript variant 1 (LOC477653); mRNA	96.709324	0.00496224	0.746622	-1.33937	XM_534848	Homo sapiens cDNA: FLJ22569 fis; clone HSI02142	AK026222	93.78428
PREDICTED: Macaca mulatta similar to Misexpression suppressor of ras 6	30.594901	0.00490079	0.691556	-1.44601	XM_001086409	Homo sapiens chromosome 5 open reading frame 22; mRNA (cDNA clone	BC032845	30.5949

CG6818-PA (LOC695901); mRNA						IMAGE:5268045); complete cds		
Canis familiaris GDP dissociation inhibitor 1 (GDI1); mRNA >gi|4103760|gb|AF027360.1|AF027360 Canis familiaris GDP dissociation inhibitor isoform 1 (GDI-1) mRNA; complete cds	94.320487	0.00488298	1.38583	1.38583	NM_001003185	Homo sapiens clone FLH182698.01L; RZPDo839B02139D GDI1 mRNA; partial sequence	DQ896843	92.08925
PREDICTED: Macaca mulatta similar to mitochondrial ribosomal protein S10 (LOC695892); mRNA	29.642857	0.00477605	0.725235	-1.37886	XM_001087232	Homo sapiens mitochondrial ribosomal protein S10 (MRPS10); nuclear gene encoding mitochondrial protein; mRNA	NM_018141	29.10714
Bos taurus similar to optineurin (MGC128158); mRNA >gi|73587016|gb|BC102937.1| Bos taurus similar to optineurin; mRNA (cDNA clone MGC:128158 IMAGE:7989473); complete cds	42.253521	0.00475457	0.691542	-1.44604	NM_001034602	NULL	NULL	NA
Bos taurus similar to transmembrane protein 68 (MGC140559); mRNA >gi|111307026|gb|BC120040.1| Bos taurus similar to transmembrane protein 68; mRNA (cDNA clone MGC:140559 IMAGE:8271914); complete cds	24.946695	0.00471281	0.671677	-1.48881	NM_001076009	Homo sapiens mRNA; cDNA DKFZp666D0510 (from clone DKFZp666D0510)	AL832935	24.30704
Felis catus PC4 and SFRS1 interacting protein 1 (PSIP1); mRNA >gi|51847741|gb|AY705213.1| Felis catus lens epithelium derived growth factor p75 mRNA; complete cds	98.368298	0.00468202	0.648668	-1.54162	NM_001009372	Homo sapiens CLL-associated antigen KW-7 mRNA; complete cds	AF432220	89.04429
PREDICTED: Canis familiaris similar to zinc finger protein 258; transcript variant 3 (LOC612956); mRNA	97.04797	0.00466341	0.634168	-1.57687	XM_858983	Homo sapiens zinc finger; BED-type containing 5; mRNA (cDNA clone MGC:54149 IMAGE:6471771); complete cds	BC047754	94.64945
PREDICTED: Canis familiaris similar to DEAH (Asp-Glu-Ala-His) box polypeptide 30 isoform 3; transcript variant 10 (LOC476639); mRNA	93.967093	0.00460438	0.761639	-1.31296	XM_858780	Homo sapiens mRNA for KIAA0890 protein; partial cds	AB020697	91.22486
PREDICTED: Canis familiaris similar to Ribosomal L1 domain containing protein 1 (Cellular senescence inhibited gene protein) (PBK1 protein) (CATX-11) (LOC479847); mRNA	88.930582	0.00459808	0.749908	-1.3335	XM_536972	Homo sapiens mRNA for PBK1 protein	AJ007398	65.10319
PREDICTED: Canis familiaris similar to eukaryotic translation initiation factor 5; transcript variant 7 (LOC480442); mRNA	99.535963	0.00457455	0.739837	-1.35165	XM_863525	Homo sapiens cDNA clone IMAGE:6672764; partial cds	BC107884	98.60789
Macaca fascicularis testis cDNA clone: QtsA-12355; similar to human	13.846154	0.00455718	0.688483	-1.45247	AB168458	Macaca fascicularis testis cDNA clone: QtsA-12355; similar to human chaperonin	AB168458	13.84615

chaperonin containing TCP1; subunit 4 (delta) (CCT4);mRNA; RefSeq: NM_006430.2						containing TCP1; subunit 4 (delta) (CCT4);mRNA; RefSeq: NM_006430.2		
PREDICTED: Canis familiaris similar to ADP/ATP translocase 3 (Adenine nucleotide translocator 2) (ANT 3) (ADP;ATP carrier protein 3) (Solute carrier family 25; member 6) (ADP;ATP carrier protein; isoform T2) (LOC480830); mRNA	91.125541	0.00454674	0.728984	-1.37177	XM_537947	Homo sapiens solute carrier family 25 (mitochondrial carrier; adenine nucleotide translocator); member 6; mRNA (cDNA clone MGC:29984 IMAGE:5141625); complete cds	BC031912	70.12987
Homo sapiens similar to bovine IgA regulatory protein; mRNA (cDNA clone IMAGE:5275203)	96.785714	0.00449558	0.71934	-1.39016	BC041380	Homo sapiens similar to bovine IgA regulatory protein; mRNA (cDNA clone IMAGE:5275203)	BC041380	96.78571
PREDICTED: Macaca mulatta similar to Stretchin-Mlck CG18255-PA; isoform A; transcript variant 2 (LOC695054); mRNA	33.71869	0.00445813	0.638375	-1.56648	XM_001084251	Homo sapiens chromosome 12 open reading frame 35 (C12orf35); mRNA	NM_018169	29.47977
PREDICTED: Canis familiaris similar to WW domain binding protein 2; transcript variant 3 (LOC608477); mRNA	99.145299	0.00442171	1.56679	1.56679	XM_853511	NULL	NULL	NA
PREDICTED: Canis familiaris similar to solute carrier family 19; member 3 (LOC486151); mRNA	61.14082	0.00423123	1.3163	1.3163	XM_543277	Synthetic construct Homo sapiens clone FLH186110.01X; RZPDo839B0171D SLC19A3 mRNA; complete sequence	DQ892411	57.75401
PREDICTED: Pan troglodytes ubiquitin-conjugating enzyme E2Q (putative) 2; transcript variant 3 (UBE2Q2); mRNA	90.072639	0.00418796	0.719791	-1.38929	XM_001145385	Homo sapiens ubiquitin-conjugating enzyme E2Q (putative) 2; mRNA (cDNA clone IMAGE:3449634); partial cds	BC006827	89.83051
Sus scrofa mRNA; clone:AMP010047A02; expressed in alveolar macrophage	24.65374	0.00411053	4.19972	4.19972	AK230808	Homo sapiens chromosome 18 clone RP11-70G19; complete sequence	AC068999	5.81718
Felis catus uncoupling protein 2 mRNA; partial cds	100	0.00409045	1.40614	1.40614	AY999301	Homo sapiens clone FLH199406.01L; RZPDo839E0881D UCP2 mRNA; partial sequence	DQ896736	95.34884
PREDICTED: Canis familiaris similar to leucine aminopeptidase (LOC479081); mRNA	95.27027	0.00403473	0.739612	-1.35206	XM_536228	Homo sapiens leucine aminopeptidase 3 (LAP3); mRNA	NM_015907	90.54054
PREDICTED: Canis familiaris similar to ubiquitin-activating enzyme E1 (LOC480896); mRNA	95.964126	0.00396074	1.46028	1.46028	XM_538014	Homo sapiens ubiquitin-activating enzyme E1 (A1S9T and BN75 temperature sensitivity complementing) (UBE1); transcript variant 2; mRNA >gi|33989140|gb|BC013041.2| Homo sapiens ubiquitin-activating enzyme E1 (A1S9T and BN75 temperature sensitivity complementing); mRNA (cDNA clone MGC:4781 IMAGE:3543021); complete cds	NM_153280	93.72197
PREDICTED: Bos taurus similar to	15.275311	0.00389589	0.730067	-	XM_869715	NULL	NULL	NA

RABEP1 protein; transcript variant 2 (LOC504785); mRNA				1.36974				
PREDICTED: Canis familiaris similar to Importin-7 (Imp7) (Ran-binding protein 7) (RanBP7); transcript variant 3 (LOC485383); mRNA	46.139706	0.00388986	0.703984	-1.42049	XM_858694	Homo sapiens chromosome 11; clone CTD-2371O3; complete sequence	AC132192	43.19853
Sus scrofa mRNA; clone:OVRM10206D03; expressed in ovary	89.932886	0.00385443	1.57559	1.57559	AK236587	Human glycogenin mRNA; complete cds	U31525	88.92617
Homo sapiens mRNA for uncoupling protein 2 variant; clone: adSU01813	90.721649	0.00383548	1.56187	1.56187	AK222557	Homo sapiens mRNA for uncoupling protein 2 variant; clone: adSU01813	AK222557	90.72165
PREDICTED: Canis familiaris similar to Putative pre-mRNA splicing factor RNA helicase (DEAH box protein 15); transcript variant 18 (LOC488856); mRNA	99.058824	0.00375142	0.759397	-1.31683	XM_859190	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Metaxin 2 (LOC478811); mRNA	96.624473	0.0037471	0.603007	-1.65836	XM_535974	Homo sapiens metaxin 2; mRNA (cDNA clone MGC:111067 IMAGE:30378040); complete cds	BC088359	85.65401
PREDICTED: Pan troglodytes similar to DAZ associated protein 1; transcript variant 1 (LOC455549); mRNA	26.336634	0.00372981	0.762013	-1.31231	XM_001147948	Homo sapiens chromosome 19 clone CTB-25B13; complete sequence	AC027307	24.75248
PREDICTED: Macaca mulatta similar to methyl-CpG binding domain protein 4 (LOC720557); partial mRNA	79.807692	0.00371656	0.734473	-1.36152	XM_001116090	Homo sapiens methyl-CpG binding domain protein 4; mRNA (cDNA clone MGC:19710 IMAGE:3534047); complete cds	BC011752	79.23077
PREDICTED: Pan troglodytes dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 2; transcript variant 3 (DYRK2); mRNA	41.119221	0.00367644	0.532381	-1.87836	XM_001161394	Homo sapiens cDNA: FLJ21365 fis; clone COL03006; highly similar to HSY13493 Homo sapiens mRNA for protein kinase Dyrk2	AK025018	41.11922
PREDICTED: Canis familiaris similar to YY1 associated factor 2 isoform a (LOC609790); mRNA	97.074954	0.00363916	0.724327	-1.38059	XM_847127	Homo sapiens YY1 associated factor 2 (YAF2); transcript variant 1; mRNA	NM_005748	94.88117
PREDICTED: Canis familiaris similar to talin 1; transcript variant 12 (LOC474759); mRNA	95.627376	0.00359437	1.52083	1.52083	XM_861653	Homo sapiens mRNA for KIAA1027 protein; partial cds	AB028950	93.34601
PREDICTED: Canis familiaris similar to RIO kinase 2; transcript variant 1 (LOC479147); mRNA	87.47698	0.00347772	0.758982	-1.31755	XM_536291	Homo sapiens RIO kinase 2 (yeast) (RIOK2); mRNA >gi|7023650|dbj|AK002021.1| Homo sapiens cDNA FLJ11159 fis; clone PLACE1006966	NM_018343	78.08472
PREDICTED: Canis familiaris similar to Matrin 3; transcript variant 14 (LOC474700); mRNA	95.26749	0.00344809	0.664402	-1.50511	XM_859179	NULL	NULL	NA
PREDICTED: Canis familiaris similar to nuclear autoantigen (LOC480282); mRNA	96.67319	0.00344668	0.755491	-1.32364	XM_537404	Homo sapiens striatin; calmodulin binding protein 3 (STRN3); mRNA	NM_014574	85.3229

PREDICTED: Canis familiaris similar to N-chimaerin (NC) (N-chimerin) (Alpha chimerin) (A-chimaerin) (Rho-GTPase-activating protein 2); transcript variant 5 (LOC478805); mRNA	92.738589	0.00342536	0.662693	-1.50899	XM_856374	NULL	NULL	NA
PREDICTED: Canis familiaris similar to UDP-Gal:betaGlcNAc beta 1;4-galactosyltransferase 1; membrane-bound form (LOC481579); mRNA	79.724409	0.00342356	1.30094	1.30094	XM_538701	Human DNA sequence from clone RP11-326F20 on chromosome 9 Contains the B4GALT1 gene for UDP-Gal:betaGlcNAc beta 1;4- galactosyltransferase; polypeptide 1 (GGTB2); a novel gene; the SPINK4 gene for serine protease inhibitor; Kazal type 4 (PEC-60); the 3-prime end of the BAG1 gene for BCL2-associated athanogene and a CpG island; complete sequence	AL161445	41.53543
PREDICTED: Macaca mulatta similar to CG11596-PA; isoform A (LOC706229); mRNA	69.120287	0.00339281	0.760339	-1.3152	XM_001094584	Homo sapiens chromosome 9 open reading frame 41 (C9orf41); mRNA >gi|21707828|gb|BC034033.1| Homo sapiens chromosome 9 open reading frame 41; mRNA (cDNA clone MGC:24721 IMAGE:4278547); complete cds	NM_152420	68.58169
PREDICTED: Canis familiaris similar to adducin 3 (gamma) isoform b; transcript variant 16 (LOC486881); mRNA	95.219885	0.0033092	0.6896	-1.45012	XM_859295	Homo sapiens adducin 3 (gamma) (ADD3); transcript variant 3; mRNA	NM_001121	92.54302
PREDICTED: Canis familiaris similar to LIM domain only 4 (predicted); transcript variant 5 (LOC479962); mRNA	34.249084	0.00328884	0.725387	-1.37857	XM_862220	Homo sapiens LIM domain only 4 (LMO4); mRNA	NM_006769	33.69963
PREDICTED: Canis familiaris similar to modulator of estrogen induced transcription isoform a; transcript variant 11 (LOC478322); mRNA	94.148936	0.00323994	0.728103	-1.37343	XM_859168	NULL	NULL	NA
PREDICTED: Pan troglodytes zinc finger protein 354A (ZNF354A); mRNA	20.773931	0.00323868	0.642126	-1.55733	XM_001140640	Homo sapiens zinc finger protein 354B; mRNA (cDNA clone MGC:132437 IMAGE:8143780); complete cds	BC104777	20.57027
PREDICTED: Canis familiaris splicing factor (SRP20); mRNA	93.956044	0.00321074	0.724175	-1.38088	XM_532124	Human DNA sequence from clone RP1-108K11 on chromosome 6p21 Contains the SFRS3 for splicing factor arginine/serine-rich (SRP20); the STK38 gene for serine/threonine protein kinase (NDR); the 3-prime end of a gene for a novel protein (2410004NRIK) and a CpG island; complete sequence	Z85986	29.67033
PREDICTED: Pan troglodytes mucolipin 2 (MCOLN2); mRNA	18.458781	0.00320704	0.544895	-1.83522	XM_513523	Homo sapiens mucolipin 2 (MCOLN2); mRNA	NM_153259	12.72401
Sus scrofa mRNA;	82.684825	0.00319291	1.33804	1.33804	AK230956	Homo sapiens cDNA FLJ16040 fis; clone	AK122620	19.84436

clone:AMP010069A02; expressed in alveolar macrophage						BRACE2006319; highly similar to Homo sapiens mRNA for Fln29		
PREDICTED: Canis familiaris similar to nucleophosmin 1; transcript variant 13 (LOC479292); mRNA	96.030246	0.00319269	0.655819	-1.52481	XM_861701	NULL	NULL	NA
PREDICTED: Canis familiaris similar to RAN binding protein 5; transcript variant 2 (LOC485528); mRNA	88.581952	0.00317521	0.617008	-1.62072	XM_854438	Human DNA sequence from clone RP11-72J7 on chromosome 13q31.2-32.1 Contains the 3-prime end of the KPNB3 gene for karyopherin (importin) beta 3; complete sequence	AL137120	38.8582
PREDICTED: Canis familiaris phosphorylase; glycogen; liver; transcript variant 1 (PYGL); mRNA	95.010846	0.00313888	1.42523	1.42523	XM_537443	Homo sapiens phosphorylase; glycogen; liver (Hers disease; glycogen storage disease type VI) (PYGL); mRNA	NM_002863	91.10629
Canis familiaris hsp70 mRNA for heat shock protein 70; complete cds; cell_type:white blood cell	37.732657	0.00311378	1.33243	1.33243	U02891	NULL	NULL	NA
Macaca fascicularis mRNA; clone QmoA-14202: similar to Homo sapiens polymerase (RNA) III (DNA directed) polypeptide E (80kD) (POLR3E); mRNA; NM_018119.2	72.625698	0.0030886	0.654611	-1.52763	AB220484	Macaca fascicularis mRNA; clone QmoA-14202: similar to Homo sapiens polymerase (RNA) III (DNA directed) polypeptide E (80kD) (POLR3E); mRNA; NM_018119.2	AB220484	72.6257
PREDICTED: Pan troglodytes transmembrane 7 superfamily member 3 (TM7SF3); mRNA	18.867925	0.00308523	0.683331	-1.46342	XM_520807	Homo sapiens cDNA FLJ34764 fis; clone NT2NE2002311	AK092083	18.86793
PREDICTED: Bos taurus hypothetical LOC540361 (LOC540361); mRNA	38.20841	0.00306474	0.765332	-1.30662	XM_593516	Homo sapiens NF-kappaB activating protein; mRNA (cDNA clone IMAGE:3925709); containing frame-shift errors	BC018968	36.38026
PREDICTED: Canis familiaris similar to Ubiquitin carboxyl-terminal hydrolase 1 (Ubiquitin thiolesterase 1) (Ubiquitin-specific processing protease 1) (Deubiquitinating enzyme 1) (hUBP); transcript variant 1 (LOC479549); mRNA	96.27907	0.0030461	0.586997	-1.70359	XM_536688	Homo sapiens ubiquitin specific peptidase 1 (USP1); transcript variant 1; mRNA	NM_003368	95.11628
Pongo pygmaeus mRNA; cDNA DKFZp469I158 (from clone DKFZp469I158)	94.029851	0.00299	0.741501	-1.34862	CR857922	Homo sapiens cDNA clone IMAGE:3507983; **** WARNING: chimeric clone ****	BC000085	93.13433
PREDICTED: Canis familiaris similar to FLN29 gene product (LOC477484); mRNA	93.934142	0.00297817	1.4569	1.4569	XM_534682	Homo sapiens clone FLH187205.01L; RZPDo839E1162D TRAFD1 mRNA; partial sequence	DQ895741	89.94801
Bos taurus similar to pyrroline-5-carboxylate reductase family; member 2 (predicted) (MGC140031); mRNA >gi|109659197|gb|BC118324.1| Bos taurus similar to pyrroline-5-carboxylate	25.932203	0.0029743	0.755853	-1.32301	NM_001075181	full-length cDNA clone CS0DB006YI05 of Neuroblastoma Cot 10-normalized of Homo sapiens (human)	CR611703	25.08475

reductase family; member 2 (predicted); mRNA (cDNA clone MGC:140031 IMAGE:8286668); complete cds								
PREDICTED: Canis familiaris similar to Telomeric repeat binding factor 2 interacting protein 1 (TRF2-interacting telomeric protein Rap1) (hRap1) (LOC479643); mRNA	58.070175	0.00292957	0.747611	-1.33759	XM_536776	Homo sapiens chromosome 5 clone CTB-22L19; complete sequence	AC016572	28.42105
Felis catus clone vb1 T-cell receptor beta chain mRNA; partial cds	100	0.00278	0.686692	-1.45626	AY316122	NULL	NULL	NA
PREDICTED: Canis familiaris similar to ataxia telangiectasia and Rad3 related protein; transcript variant 4 (LOC477101); mRNA	97.123894	0.00276107	0.585999	-1.70649	XM_860680	PREDICTED: Homo sapiens ataxia telangiectasia and Rad3 related (ATR); mRNA	XM_001131387	94.9115
Macaca fascicularis brain cDNA clone: QmoA-11831; similar to human tyrosine 3-monooxygenase/tryptophan 5-monooxygenaseactivation protein; eta polypeptide (YWHAH); mRNA; RefSeq: NM_003405.2	70.208729	0.00272394	3.17002	3.17002	XM_001111955	Macaca fascicularis brain cDNA; clone: QccE-13821; similar to human tyrosine 3-monooxygenase/tryptophan 5-monooxygenaseactivation protein; eta polypeptide (YWHAH); mRNA; RefSeq: NM_003405.2	AB169524	70.01898
PREDICTED: Canis familiaris similar to U2 small nuclear ribonucleoprotein A (U2 snRNP-A); transcript variant 2 (LOC607102); mRNA	82.073434	0.00271318	0.732487	-1.36521	XM_843830	Homo sapiens small nuclear ribonucleoprotein polypeptide A-prime ; mRNA (cDNA clone MGC:39248 IMAGE:4904205); complete cds	BC022816	44.49244
Sus scrofa mRNA; clone:UTR010024C05; expressed in uterus	11.140584	0.00270671	0.698601	-1.43143	AK240040	Human DNA sequence from clone RP11-301G21 on chromosome 1 Contains a acid phosphatase 1 soluble (ACP1) pseudogene; complete sequence	AL663058	11.67109
PREDICTED: Canis familiaris similar to DEAH (Asp-Glu-Ala-His) box polypeptide 36 (LOC477117); mRNA	91.858407	0.00267951	0.722639	-1.38382	XM_534311	Homo sapiens mRNA for putative DExH/D RNA helicase (RHAU gene); nuclear isoform	AJ577133	89.73451
PREDICTED: Canis familiaris similar to cutaneous T-cell lymphoma tumor antigen se70-2; transcript variant 3 (LOC476955); mRNA	98.961938	0.00266899	0.635056	-1.57466	XM_844200	NULL	NULL	NA
Macaca fascicularis brain cDNA clone: QccE-16570; similar to human hypothetical protein FLJ30046 (FLJ30046); mRNA; RefSeq: NM_144595.2	88.507719	0.00264912	0.728197	-1.37325	XR_025403	Homo sapiens SLAIN motif family; member 1 (SLAIN1); transcript variant 2; mRNA	NM_144595	88.33619
PREDICTED: Canis familiaris similar to U2 small nuclear ribonucleoprotein A (U2 snRNP-A); transcript variant 3 (LOC607102); mRNA	96.22093	0.00259968	0.704073	-1.42031	XM_852301	Homo sapiens clone FLH190169.01L; RZPDo839F0465D SNRPA1 mRNA; partial sequence	DQ896084	95.05814
PREDICTED: Pan troglodytes hypothetical LOC465800; transcript	58.008658	0.00258342	0.744607	-1.34299	XM_001144357	Homo sapiens phosphoribosyl pyrophosphate synthetase 1 (PRPS1);	NM_002764	58.00866

variant 1 (LOC465800); mRNA						mRNA >gi|12804406|gb|BC001605.1| Homo sapiens phosphoribosyl pyrophosphate synthetase 1; mRNA (cDNA clone MGC:2256 IMAGE:3542584); complete cds		
PREDICTED: Pan troglodytes hypothetical protein LOC742056 (LOC742056); mRNA	11.490126	0.00251239	0.671994	-1.48811	XM_001145984	Homo sapiens mRNA for FLJ00320 protein	AK160376	11.49013
Felis catus CD4 antigen (CD4); mRNA >gi|1794138|dbj|AB000483.1| Felis catus mRNA for CD4 antigen; complete cds	100	0.00245955	0.678077	-1.47476	NM_001009250	Homo sapiens CD4 molecule (CD4); mRNA	NM_000616	26.06285
PREDICTED: Canis familiaris similar to activator of basal transcription 1 (LOC488284); mRNA	15.246637	0.00245778	0.757653	-1.31987	XM_545406	Homo sapiens activator of basal transcription 1 (ABT1); mRNA	NM_013375	10.3139
Sus scrofa mRNA; clone:OVRM10005G03; expressed in ovary	95.113438	0.00240499	0.750234	-1.33292	AK234677	Homo sapiens inositol polyphosphate-4-phosphatase; type II; 105kDa; mRNA (cDNA clone IMAGE:6165861); partial cds	BC072447	94.41536
Sus scrofa mRNA; clone:TES010065C05; expressed in testis	7.251908	0.00232429	0.760109	-1.3156	AK238548	Homo sapiens BAC clone RP11-346I14 from 2; complete sequence	AC105760	4.38931
Felis catus chemokine receptor 5 (CCR5); mRNA >gi|27543517|dbj|AB022910.1| Felis catus mRNA for chemokine receptor 5; complete cds	100	0.00228852	1.40057	1.40057	NM_001009248	NULL	NULL	NA
PREDICTED: Canis familiaris similar to IP63 protein; transcript variant 1 (LOC607243); mRNA	88.703704	0.00224448	0.739646	-1.352	XM_853399	Human DNA sequence from clone RP11-336N8 on chromosome 9q21.11-21.31 Contains a synaptogyrin 2 (SYNGR2) pseudogene; an argininosuccinate synthetase (ASS) pseudogene; a ribosomal protein L21 (RPL21) pseudogene; a CDC28 protein kinase regulatory subunit 2 (CKS2) pseudogene; the C9orf81 gene for chromosome 9 open reading frame 81 and a CpG island; complete sequence	AL353705	82.96296
Macaca fascicularis testis cDNA clone: QtsA-12474; similar to human M-phase phosphoprotein 11 (LOC402580); mRNA; RefSeq: XM_379909.1	95.591647	0.00222063	0.641487	-1.55888	AB168480	Macaca fascicularis testis cDNA clone: QtsA-12474; similar to human M-phase phosphoprotein 11 (LOC402580); mRNA; RefSeq: XM_379909.1	AB168480	95.59165
Equus caballus dermatan sulfate proteoglycan II mRNA; complete cds	94.515539	0.00218909	1.37391	1.37391	AF038127	NULL	NULL	NA
PREDICTED: Canis familiaris similar to splicing factor; arginine/serine-rich 11; transcript variant 4 (LOC490216);	98.648649	0.0021708	0.680158	-1.47025	XM_862855	Human DNA sequence from clone RP4-677H15 on chromosome 1p31.3-32.3 Contains gene FLJ20331; two novel	AL353771	96.62162

mRNA						genes; the SFRS11 gene for arginine/serine-rich 11 splicing factor and the 3-prime end of gene DKFZP566D1346; complete sequence		
PREDICTED: Canis familiaris similar to DEAD (Asp-Glu-Ala-Asp) box polypeptide 20 (LOC475859); mRNA	95.335821	0.00214523	0.746765	-1.33911	XM_533068	Homo sapiens clone FLH184505.01L; RZPDo839G09143D DDX20 mRNA; partial sequence	DQ895449	94.40299
PREDICTED: Canis familiaris similar to CG1218-PA; transcript variant 2 (LOC477355); mRNA	87.922705	0.002071	0.722447	-1.38419	XM_851303	Homo sapiens chromosome 4 open reading frame 27; mRNA (cDNA clone MGC:13432 IMAGE:4334172); complete cds	BC010367	87.19807
PREDICTED: Canis familiaris similar to TIA1 protein isoform 2; transcript variant 10 (LOC610625); mRNA	93.262411	0.00206482	0.604788	-1.65347	XM_861502	Homo sapiens BAC clone RP11-175A7 from 2; complete sequence	AC016700	87.58865
Macaca fascicularis brain cDNA clone: QflA-20750; similar to human RALBP1 associated Eps domain containing 2 (REPS2); mRNA; RefSeq: NM_004726.1	85.887097	0.00204749	1.64343	1.64343	XR_014560	Homo sapiens RALBP1 associated Eps domain containing 2 (REPS2); mRNA >gi|2895090|gb|AF010233.1|AF010233 Homo sapiens RalBP1-interacting protein (POB1) mRNA; complete cds	NM_004726	79.03226
PREDICTED: Canis familiaris similar to RAB6 interacting protein 1 (LOC476844); mRNA	93.638171	0.00203731	1.41921	1.41921	XM_534048	Homo sapiens RAB6 interacting protein 1 (RAB6IP1); mRNA	NM_015213	92.44533
PREDICTED: Canis familiaris similar to DEK oncogene (DNA binding) (LOC610538); mRNA	63.752277	0.0020129	0.625464	-1.59881	XM_848066	Human chromosome 14 DNA sequence BAC R-248B24 of library RPCI-11 from chromosome 14 of Homo sapiens (Human); complete sequence	AL133373	30.23679
PREDICTED: Canis familiaris similar to BRCA2 and CDKN1A-interacting protein isoform BCCIPbeta (LOC477864); mRNA	89.221557	0.00200268	0.678493	-1.47385	XM_535056	full-length cDNA clone CS0DE002YF04 of Placenta of Homo sapiens (human)	CR592263	63.67266
PREDICTED: Canis familiaris similar to Dihydropyrimidinase (DHPase) (Hydantoinase) (DHP); transcript variant 1 (LOC475067); mRNA	88.713911	0.00198608	0.57282	-1.74575	XM_532301	Homo sapiens dihydropyrimidinase (DPYS); mRNA >gi|2339965|dbj|D78011.1| Homo sapiens mRNA for dihydropyrimidinase; complete cds	NM_001385	36.48294
PREDICTED: Canis familiaris similar to senataxin; transcript variant 1 (LOC480691); mRNA	12.133891	0.00198021	0.665668	-1.50225	XM_537811	Homo sapiens cDNA FLJ10594 fis; clone NT2RP2004689	AK001456	10.46025
PREDICTED: Bos taurus similar to src homology 3 domain-containing protein HIP-55; transcript variant 2 (LOC514706); mRNA	48.691099	0.00189646	1.3848	1.3848	XM_592601	NULL	NULL	NA
PREDICTED: Canis familiaris similar to NMDA receptor regulated 1-like protein isoform 1 (LOC485464); mRNA	62.847222	0.00188096	0.671286	-1.48968	XM_542583	Macaca fascicularis brain cDNA; clone:QnpA-18434; similar to human NMDA receptor regulated 1-like protein isoform (NARG1L); mRNA; NM_024561.2	AB049844	61.63194

Felis catus colony stimulating factor 1 (CSF1); mRNA >gi|163854|gb|J03149.1|CATFMSC Cat (F.domesticus) c-fms proto-oncogene mRNA encoding M-CSF receptor; complete cds	74.513619	0.00184505	1.42376	1.42376	NM_001009231	Homo sapiens mRNA; cDNA DKFZp686G20209 (from clone DKFZp686G20209)	BX648599	15.5642
PREDICTED: Canis familiaris similar to zinc finger protein 258; transcript variant 3 (LOC612956); mRNA	94.627383	0.00183215	0.685443	-1.45891	XM_859004	Homo sapiens zinc finger; BED-type containing 5; mRNA (cDNA clone MGC:54149 IMAGE:6471771); complete cds	BC047754	92.72097
Bos taurus similar to hypothetical protein (FLJ20436); mRNA >gi|61554928|gb|BT021786.1| Bos taurus hypothetical protein FLJ20436 (FLJ20436); mRNA; complete cds	42.156863	0.00182632	0.680369	-1.46979	NM_001024571	NULL	NULL	NA
Sus scrofa mRNA; clone:LVR010010D04; expressed in liver	60	0.00182272	0.756224	-1.32236	AK232271	Homo sapiens D-prohibitin mRNA; complete cds	AF178980	58.91892
PREDICTED: Macaca mulatta similar to Plasminogen activator inhibitor 1 RNA-binding protein (PAI1 RNA-binding protein 1) (PAI-RBP1) (SERPINE1 mRNA-binding protein 1); transcript variant 3 (SERBP1); mRNA	96.901893	0.00181276	0.746177	-1.34016	XM_001094846	Homo sapiens SERPINE1 mRNA binding protein 1; mRNA (cDNA clone MGC:21447 IMAGE:3446543); complete cds	BC020555	96.38554
PREDICTED: Canis familiaris similar to carbohydrate (chondroitin) synthase 1 (LOC488704); mRNA	93.491124	0.00177081	1.34051	1.34051	XM_545821	Homo sapiens carbohydrate (chondroitin) synthase 1; mRNA (cDNA clone MGC:47652 IMAGE:5751618); complete cds	BC046247	92.50493
PREDICTED: Canis familiaris similar to Selenoprotein P precursor (SeP); transcript variant 2 (LOC479346); mRNA	83.064516	0.00174552	0.747223	-1.33829	XM_862923	Macaca fascicularis brain cDNA; clone: QtrA-12102; similar to human selenoprotein P; plasma; 1 (SEPP1); mRNA; RefSeq: NM_005410.1	AB169844	43.54839
PREDICTED: Canis familiaris similar to Serine/threonine phosphatase 4 regulatory subunit 1; transcript variant 6 (LOC480207); mRNA	88.059701	0.00174018	1.32669	1.32669	XM_854576	Homo sapiens cDNA: FLJ23411 fis; clone HEP20452; highly similar to AF111106 Homo sapiens protein serine/threonine phosphatase 4 regulatory subunit 1 (PP4R1) mRNA	AK027064	81.34328
PREDICTED: Bos taurus hypothetical LOC534513 (LOC534513); mRNA	84.705882	0.00173171	0.666133	-1.5012	XM_614308	Macaca fascicularis testis cDNA clone: QtsA-20060; similar to human retinoblastoma-associated protein 140 (RAP140); mRNA; RefSeq: NM_015224.1	AB179442	83.76471
Homo sapiens splicing factor; arginine/serine-rich 6 (SFRS6); mRNA	15.942029	0.00167398	0.706151	-1.41613	NM_006275	Human DNA sequence from clone RP5-862K6 on chromosome 20q12-13.13 Contains the 5-prime end of the L3MBTL gene for l(3)mbt-like (Drosophila); the SFRS6 gene for arginine/serine-rich	AL031681	15.94203

						splicing factor 6; the EIF4EBP2P gene for eukaryotic translation initiation factor 4E binding protein 2 pseudogene; a pseudogene similar to part of nucleotide binding protein (NBP) and two CpG islands; complete sequence		
Felis catus clone vb8 T-cell receptor beta chain mRNA; partial cds	97.965116	0.00164183	0.66923	-1.49425	AY316132	NULL	NULL	NA
PREDICTED: Canis familiaris similar to interferon-induced protein with tetratricopeptide repeats 3 (LOC606808); mRNA	83.956044	0.00164078	5.47391	5.47391	XM_843227	Homo sapiens interferon-induced protein with tetratricopeptide repeats 3; mRNA (cDNA clone MGC:3834 IMAGE:2906188); complete cds	BC004977	24.61539
PREDICTED: Canis familiaris similar to growth inhibition and differentiation related protein 86 (LOC477380); mRNA	85.598377	0.0016094	0.73863	-1.35386	XM_534574	PREDICTED: Homo sapiens R3H domain and coiled-coil containing 1 (R3HCC1); mRNA	XM_939319	63.69168
Felis catus CD8 antigen; beta polypeptide (CD8B); mRNA >gi|1794140|dbj|AB000484.1| Felis catus mRNA for CD8 beta antigen; complete cds	100	0.00160652	0.556946	-1.79551	NM_001009867	Homo sapiens CD8b molecule (CD8B); transcript variant 1; mRNA	NM_172099	75.19084
PREDICTED: Canis familiaris similar to SMC6 protein (LOC475675); mRNA	56.25	0.00160119	0.568846	-1.75795	XM_532882	Homo sapiens structural maintenance of chromosomes 6; mRNA (cDNA clone MGC:48735 IMAGE:5724409); complete cds	BC039828	54.32692
PREDICTED: Canis familiaris similar to Probable D-tyrosyl-tRNA(Tyr) deacylase (LOC607771); mRNA	40.451745	0.00158961	0.688602	-1.45222	XM_844566	Homo sapiens histidyl-tRNA synthetase 2; mRNA (cDNA clone MGC:119131 IMAGE:40003913); complete cds	BC100924	24.64066
PREDICTED: Canis familiaris similar to Alpha-N-acetylgalactosaminidase precursor (Alpha-galactosidase B) (LOC481226); mRNA	94.505495	0.00158063	1.36744	1.36744	XM_538347	Homo sapiens clone FLH180795.01L; RZPDo839G02133D NAGA mRNA; partial sequence	DQ895062	89.45055
PREDICTED: Canis familiaris similar to joined to JAZF1 (LOC491158); mRNA	68.287526	0.00157137	0.738564	-1.35398	XM_548278	Homo sapiens suppressor of zeste 12 homolog (Drosophila); mRNA (cDNA clone IMAGE:4155691)	BC018583	66.80761
PREDICTED: Canis familiaris similar to glutamate receptor; ionotropic; N-methyl D-asparate-associated protein 1 (LOC475118); mRNA	96.557659	0.00155975	1.3384	1.3384	XM_532348	Homo sapiens glutamate receptor; ionotropic; N-methyl D-asparate-associated protein 1 (glutamate binding) (GRINA); transcript variant 2; mRNA	NM_001009184	91.56627
PREDICTED: Canis familiaris similar to polycomb group ring finger 6 isoform a (LOC609633); mRNA	86.116323	0.00155722	0.65881	-1.51789	XM_846928	Macaca fascicularis testis cDNA clone: QtsA-18584; similar to human ring finger protein 134 (RNF134); mRNA; RefSeq: NM_032154.3	AB179371	31.89493
Homo sapiens nucleophosmin (nucleolar phosphoprotein B23; numatrin) (NPM1); transcript variant 1; mRNA	100	0.00155425	0.651184	-1.53567	BC008341	Homo sapiens cDNA clone IMAGE:3509098; **** WARNING: chimeric clone ****	BC008341	100

PREDICTED: Canis familiaris hypothetical LOC480172 (LOC480172); mRNA	94.623656	0.00153935	0.74809	-1.33674	XM_537296	Homo sapiens chromosome 18 open reading frame 17; mRNA (cDNA clone MGC:149702 IMAGE:40117556); complete cds	BC121035	91.21864
PREDICTED: Pan troglodytes methyltransferase like 7A; transcript variant 2 (METTL7A); mRNA	59.756098	0.00148771	1.49634	1.49634	XM_001152216	Homo sapiens mRNA for hypothetical protein LOC25840 variant; clone: SYN03575	AK225689	59.55285
PREDICTED: Bos taurus similar to CG3304-PA (LOC505627); mRNA	21.398305	0.00145855	0.645247	-1.54979	CR859713	Homo sapiens chromosome 5 clone RP11-395C3; complete sequence	AC099513	20.97458
PREDICTED: Canis familiaris similar to programmed cell death 4 isoform 1; transcript variant 1 (LOC477818); mRNA	44.10058	0.00145602	0.696113	-1.43655	XM_535012	NULL	NULL	NA
full-length cDNA clone CS0DD001YB03 of Neuroblastoma Cot 50-normalized of Homo sapiens (human)	10.940171	0.00144499	1.49757	1.49757	CR609793	Homo sapiens HSPC270 mRNA; partial cds	AF161388	10.94017
PREDICTED: Canis familiaris similar to Flightless-I protein homolog (LOC479521); mRNA	95.028681	0.00143008	1.34812	1.34812	XM_536659	Macaca fascicularis testis cDNA; clone: QtsA-18039; similar to human flightless I homolog (Drosophila) (FLII); mRNA; RefSeq: NM_002018.2	AB169208	91.587
Felis catus chemokine (C-X-C motif) receptor 4 (CXCR4); mRNA >gi|4200300|emb|AJ009816.1|FCA9816 Felis catus mRNA for CXCR4 chemokine receptor	100	0.00139532	0.697223	-1.43426	NM_001009826	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Zinc finger protein 292 (LOC481908); mRNA	95.378928	0.00139366	0.638335	-1.56658	XM_539029	PREDICTED: Homo sapiens zinc finger protein 292; transcript variant 4 (ZNF292); mRNA	XM_938563	92.2366
PREDICTED: Canis familiaris similar to Zinc finger protein 265 (Zinc finger; splicing) (LOC490213); mRNA	97.281553	0.00135316	0.614987	-1.62605	XM_547334	Homo sapiens zinc finger; RAN-binding domain containing 2 (ZRANB2); transcript variant 1; mRNA	NM_203350	97.08738
PREDICTED: Pan troglodytes similar to protein kinase (LOC751063); partial mRNA	25.095057	0.0013462	0.728649	-1.3724	XM_001175466	Homo sapiens protein kinase; X-linked (PRKX); mRNA >gi|1052736|emb|X85545.1|HSPKX1MR H.sapiens mRNA for protein kinase; PKX1	NM_005044	25.09506
PREDICTED: Canis familiaris similar to DNA-binding protein SATB1 (Special AT-rich sequence binding protein 1) (LOC485650); mRNA	98.196393	0.00133019	0.622434	-1.6066	XM_542770	NULL	NULL	NA
Homo sapiens methyltransferase 11 domain containing 1 (METT11D1); transcript variant 2; mRNA	89.44591	0.00130038	0.758576	-1.31826	NM_022734	PREDICTED: Homo sapiens similar to methyltransferase 11 domain containing 1 isoform 2 (LOC731602); mRNA	XM_001130199	89.44591
Sus scrofa mRNA; clone:ITT010018D11; expressed in intestine	91.314554	0.00129534	0.755331	-1.32392	AK236957	Homo sapiens cDNA clone IMAGE:3959863; **** WARNING: chimeric clone ****	BC009885	87.55869
PREDICTED: Pan troglodytes similar to	27.938343	0.00127857	1.31163	1.31163	XM_001171524	full-length cDNA clone CS0DH007YD17 of	CR619528	16.37765

MyD88; transcript variant 2 (LOC460269); mRNA						T cells (Jurkat cell line) of Homo sapiens (human)		
PREDICTED: Pan troglodytes chromosome 1 open reading frame 9 protein (LOC457516); mRNA	96.923077	0.00127573	0.73236	-1.36545	XM_514000	Homo sapiens chromosome 1 open reading frame 9 (C1orf9); transcript variant 1; mRNA >gi|4200227|emb|AL035291.1|HS125H231 H.sapiens gene from PACs 125H23 and 105D12	NM_014283	96.92308
PREDICTED: Canis familiaris similar to ribosomal protein L14; transcript variant 3 (LOC480789); mRNA	61.634103	0.00126754	0.710014	-1.40842	XM_843756	full-length cDNA clone CS0DM002YH21 of Fetal liver of Homo sapiens (human)	CR623795	59.68028
PREDICTED: Canis familiaris similar to SET protein (Phosphatase 2A inhibitor I2PP2A) (I-2PP2A) (Template activating factor I) (TAF-I) (HLA-DR associated protein II) (PHAPII) (Inhibitor of granzyme A-activated DNase) (IGAAD) (LOC608952); mRNA	97.709924	0.0012452	0.710988	-1.40649	XM_846114	Homo sapiens clone FLH170300.01L; RZPDo839D1297D SET mRNA; partial sequence	DQ894408	95.41985
Bos taurus similar to splicing factor p54 (MGC139252); mRNA >gi|109939969|gb|BC118154.1| Bos taurus similar to splicing factor p54; mRNA (cDNA clone MGC:139252 IMAGE:8206002); complete cds	40.689655	0.00123317	0.596847	-1.67547	NM_001075521	Human arginine-rich nuclear protein mRNA; complete cds	M74002	39.31035
PREDICTED: Canis familiaris similar to Protein C1orf43 (Hepatitis C virus NS5A-transactivated protein 4) (NICE-3 protein) (S863-3); transcript variant 7 (LOC480136); mRNA	27.859779	0.00121941	0.733319	-1.36366	XM_860419	NULL	NULL	NA
PREDICTED: Pan troglodytes similar to UTP18 protein (LOC455135); mRNA	92.764378	0.00120332	0.610087	-1.63911	XR_024756	Homo sapiens UTP18; small subunit (SSU) processome component; homolog (yeast); mRNA (cDNA clone MGC:39182 IMAGE:4861495); complete cds	BC025276	92.57885
Felis catus clone E27 keratin 18 mRNA; partial cds	100	0.00116146	0.549202	-1.82082	AY662510	Homo sapiens clone FLH167528.01L; RZPDo839B1189D KRT18 mRNA; partial sequence	DQ893715	86.99187
PREDICTED: Canis familiaris similar to Forkhead box protein O1A (Forkhead in rhabdomyosarcoma) (LOC477295); mRNA	72.103004	0.00116099	0.532176	-1.87908	XM_534487	Human PAX-3-FKHR gene fusion mRNA; partial cds	U02308	65.23605
Sus scrofa calcium/calmodulin-dependent protein kinase II delta 2-subunit (CAMK2D); mRNA >gi|1661131|gb|U73504.1|SSU73504 Sus scrofa calcium/calmodulin-dependent protein kinase II delta 2-	99.186992	0.00113861	0.72789	-1.37383	NM_214381	Homo sapiens calcium/calmodulin-dependent protein kinase (CaM kinase) II delta (CAMK2D); transcript variant 3; mRNA	NM_001221	97.56098

subunit mRNA; complete cds								
PREDICTED: Canis familiaris similar to WW domain binding protein 2; transcript variant 5 (LOC608477); mRNA	53.012048	0.00113133	1.37631	1.37631	XM_853594	Homo sapiens clone FLH168858.01L; RZPDo839D1293D WBP2 mRNA; partial sequence	DQ894231	49.63855
Bos taurus similar to MKI67 FHA domain interacting nucleolar phosphoprotein (Nucleolar protein interacting with the FHA domain of pKI-67) (hNIFK) (Nucleolar phosphoprotein Nopp34) (MGC127116); mRNA >gi|74267637|gb|BC102791.1| Bos taurus similar to MKI67 FHA domain interacting nucleolar phosphoprotein (Nucleolar protein interacting with the FHA domain of pKI-67) (hNIFK) (Nucleolar phosphoprotein Nopp34); mRNA (cDNA clone MGC:127116 IMAGE:7944249); complete cds	70.4947	0.00112116	0.700613	-1.42732	NM_001034354	Homo sapiens MKI67 (FHA domain) interacting nucleolar phosphoprotein; mRNA (cDNA clone MGC:30198 IMAGE:4997441); complete cds	BC022990	66.07774
PREDICTED: Canis familiaris similar to CG9882-PA (LOC475460); mRNA	96.583144	0.0010954	0.726119	-1.37719	XM_532684	Homo sapiens hypothetical protein BC004337; mRNA (cDNA clone IMAGE:3631943); partial cds	BC004337	91.79954
PREDICTED: Canis familiaris similar to S-phase kinase-associated protein 1A isoform b (LOC474682); mRNA	91.825095	0.00107612	0.760964	-1.31412	XM_531908	full-length cDNA clone CS0DF003YO14 of Fetal brain of Homo sapiens (human)	CR602760	66.1597
PREDICTED: Canis familiaris similar to Stathmin (Phosphoprotein p19) (pp19) (Oncoprotein 18) (Op18) (Leukemia-associated phosphoprotein p18) (pp17) (Prosolin) (Metablastin) (Pr22 protein); transcript variant 1 (LOC478175); mRNA	95.898438	0.00107038	0.571698	-1.74918	XM_535349	Macaca fascicularis testis cDNA; clone: QtsA-16615; similar to human stathmin 1/oncoprotein 18 (STMN1); transcript variant 3;mRNA; RefSeq: NM_005563.3	AB169018	92.96875
PREDICTED: Canis familiaris similar to SWI/SNF related; matrix associated; actin dependent regulator of chromatin; subfamily e; member 1; transcript variant 1 (LOC608250); mRNA	99.255121	0.00105475	0.708524	-1.41139	XM_537645	Homo sapiens SWI/SNF related; matrix associated; actin dependent regulator of chromatin; subfamily e; member 1 (SMARCE1); mRNA	NM_003079	98.51024
PREDICTED: Canis familiaris similar to Gamma enolase (2-phospho-D-glycerate hydro-lyase) (Neural enolase) (Neuron-specific enolase) (NSE) (Enolase 2); transcript variant 2 (LOC477709); mRNA	12.550607	0.000987345	0.640072	-1.56232	XM_534902	Homo sapiens BAC clone RP11-418H16 from 2; complete sequence	AC007389	6.07287
PREDICTED: Canis familiaris similar to retinoblastoma binding protein 7; transcript variant 4 (LOC480854); mRNA	96.113074	0.000984561	0.703222	-1.42203	XM_852758	Human retinoblastoma-binding protein (RbAp46) mRNA; complete cds	U35143	92.40283

PREDICTED: Pan troglodytes similar to Zinc finger CCCH-type containing 14 (LOC453092); mRNA	9.186352	0.000972554	0.628134	-1.59202	XM_612741	Homo sapiens putative NY-REN-37 antigen isoform 4 mRNA; complete cds; alternatively spliced	AY578063	9.18635
PREDICTED: Canis familiaris similar to 26S proteasome non-ATPase regulatory subunit 10 (26S proteasome regulatory subunit p28) (Gankyrin); transcript variant 5 (LOC481014); mRNA	39.506173	0.000948069	0.71437	-1.39984	XM_857630	Homo sapiens proteasome (prosome; macropain) 26S subunit; non-ATPase; 10 (PSMD10); transcript variant 2; mRNA	NM_170750	20.10582
PREDICTED: Pan troglodytes similar to profilin IIa (LOC460989); mRNA	97.336562	0.000932347	0.540383	-1.85054	XM_516998	Homo sapiens profilin 2 (PFN2); transcript variant 1; mRNA	NM_053024	97.33656
PREDICTED: Canis familiaris similar to Selenoprotein P precursor (SeP); transcript variant 1 (LOC479346); mRNA	40.238095	0.000929008	0.624247	-1.60193	XM_862927	Homo sapiens selenoprotein P; plasma; 1 (SEPP1); mRNA	NM_005410	24.52381
PREDICTED: Pan troglodytes hypothetical LOC465771; transcript variant 4 (LOC465771); mRNA	89.839572	0.000918909	0.498995	-2.00403	XM_521189	Homo sapiens G protein-coupled receptor associated sorting protein 2; mRNA (cDNA clone IMAGE:5271751)	BC051707	89.83957
Sus scrofa mRNA; clone:MLN010076E07; expressed in mesenteric lymph node	99.126638	0.000894827	0.67273	-1.48648	AK233947	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Tetraspanin-13 (Tspan-13) (Transmembrane 4 superfamily member 13) (Tetraspan NET-6) (LOC482332); mRNA	89.830508	0.000861772	0.471024	-2.12304	XM_539449	full-length cDNA clone CS0DI065YG03 of Placenta Cot 25-normalized of Homo sapiens (human)	CR602288	50.84746
Bos taurus mitogen-activated protein kinase 13 (MAPK13); mRNA >gi|59858092|gb|BT020864.1| Bos taurus mitogen-activated protein kinase 13 (MAPK13); mRNA; complete cds	83.365571	0.000837587	1.33557	1.33557	NM_001014947	Homo sapiens clone FLH176308.01L; RZPDo839B11121D MAPK13 mRNA; partial sequence	DQ894551	61.5087
PREDICTED: Pan troglodytes similar to cytokeratin 18 (424 AA) (LOC451924); mRNA	87.234043	0.000834521	0.397539	-2.51548	XR_025386	Homo sapiens BAC clone RP11-357C22 from Y; complete sequence	AC012667	87.23404
PREDICTED: Canis familiaris similar to monoacylglycerol O-acyltransferase 1 (LOC488548); mRNA	54.766031	0.000815306	1.71051	1.71051	XM_545667	Homo sapiens monoacylglycerol O-acyltransferase 1 (MOGAT1); mRNA >gi|15099956|gb|AF384163.1|AF384163 Homo sapiens diacylglycerol acyltransferase 2-like protein mRNA; complete cds	NM_058165	48.87348
PREDICTED: Canis familiaris similar to Zinc finger protein 292 (LOC481908); mRNA	96.601942	0.000810683	0.602344	-1.66018	XM_539029	PREDICTED: Homo sapiens zinc finger protein 292; transcript variant 4 (ZNF292); mRNA	XM_938563	93.93204
PREDICTED: Canis familiaris similar to Galectin-3 binding protein precursor (Lectin galactoside-binding soluble 3	46.915888	0.000788814	1.83093	1.83093	XM_540464	Homo sapiens clone FLH184271.01L; RZPDo839E01143D LGALS3BP mRNA; partial sequence	DQ895424	43.17757

binding protein) (Mac-2 binding protein) (Mac-2 BP) (MAC2BP) (Tumor-associated antigen 90K) (LOC483345); mRNA								
PREDICTED: Canis familiaris similar to acetyl-CoA synthetase 2-like (LOC477002); mRNA	83.070866	0.000756832	1.31127	1.31127	XM_534200	Homo sapiens mRNA; cDNA DKFZp666G0810 (from clone DKFZp666G0810)	AL832939	36.81102
PREDICTED: Canis familiaris similar to Protein C22orf8 (LOC481208); mRNA	48.101265	0.000747509	0.57799	-1.73013	XM_538329	Homo sapiens family with sequence similarity 118; member A; mRNA (cDNA clone MGC:8848 IMAGE:3860694); complete cds	BC013696	44.48463
PREDICTED: Canis familiaris similar to RAB6 interacting protein 1 (LOC476844); mRNA	95.789474	0.0007268	1.5436	1.5436	XM_534048	Homo sapiens RAB6 interacting protein 1 (RAB6IP1); mRNA	NM_015213	95.78947
PREDICTED: Macaca mulatta similar to ring finger protein 167; transcript variant 10 (LOC710656); mRNA	90.235081	0.000712076	1.33483	1.33483	XM_001098694	NULL	NULL	NA
Bos taurus similar to hypothetical protein (FLJ20436); mRNA >gi|61554928|gb|BT021786.1| Bos taurus hypothetical protein FLJ20436 (FLJ20436); mRNA; complete cds	95.068027	0.000699858	0.762807	-1.31095	NM_001024571	Homo sapiens cDNA FLJ20436 fis; clone KAT03972	AK000443	79.42177
Homo sapiens mRNA; cDNA DKFZp686H1697 (from clone DKFZp686H1697)	27.293578	0.000661059	0.570125	-1.754	BX647547	Homo sapiens mRNA; cDNA DKFZp686H1697 (from clone DKFZp686H1697)	BX647547	27.29358
PREDICTED: Canis familiaris similar to Coronin-1C (Coronin-3) (hCRNN4) (LOC486318); mRNA	86.379928	0.000634606	1.53908	1.53908	XM_543444	Homo sapiens coronin; actin binding protein; 1C (CORO1C); mRNA	NM_014325	84.76703
PREDICTED: Canis familiaris similar to 40S ribosomal protein S28 (LOC485010); mRNA	94.488189	0.000610333	0.673916	-1.48387	XM_542128	PREDICTED: Homo sapiens similar to 40S ribosomal protein S28 (LOC645899); mRNA	XM_941610	79.52756
Homo sapiens ribosomal protein; large; P2; mRNA (cDNA clone MGC:71408 IMAGE:4685028); complete cds	66.259169	0.000600043	0.681361	-1.46765	BC062314	Homo sapiens ribosomal protein; large; P2; mRNA (cDNA clone MGC:12453 IMAGE:4052568); complete cds	BC005354	66.25917
PREDICTED: Canis familiaris similar to RAB GTPase activating protein 1-like; transcript variant 2 (LOC480064); mRNA	34.863946	0.000593008	0.655626	-1.52526	XM_856054	Human DNA sequence from clone RP1-102G20 on chromosome 1q24-25 Contains a novel pseudogene; two novel genes; a ribosomal protein S26 (RPS26) pseudogenem; the 3-prime end of the gene for expressed in hematopoietic cells (heart; liver) (HLL); the gene for Siah-interacting protein (SIP); the 3-prime end of the MRPS14 gene for mitochondrial ribosomal protein S14 and a CpG island; complete sequence	Z99127	33.84354
PREDICTED: Canis familiaris similar to	46.714032	0.000584197	0.754545	-1.3253	XM_854805	NULL	NULL	NA

eukaryotic translation elongation factor 1 beta 2; transcript variant 4 (LOC478881); mRNA								
Felis catus CD3 antigen epsilon (CD3E); mRNA >gi|56378114|dbj|AB195840.1| Felis catus cd3e mRNA for CD3 antigen epsilon subunit; complete cds; cell_type:thymocyte	83.159722	0.000581424	0.590272	-1.69413	NM_001009862	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Glutaminase; kidney isoform; mitochondrial precursor (GLS) (L-glutamine amidohydrolase) (K-glutaminase); transcript variant 1 (LOC488448); mRNA	98	0.000563063	0.759107	-1.31734	XM_545570	Homo sapiens glutaminase kidney isoform mRNA; complete cds	AF223943	95.42857
Homo sapiens SMT3 suppressor of mif two 3 homolog 2 (S. cerevisiae) (SUMO2); transcript variant 1; mRNA	100	0.000549172	0.712636	-1.40324	AK225090	Homo sapiens mRNA for SMT3 suppressor of mif two 3 homolog 2 variant; clone: CAS08355	AK225090	100
PREDICTED: Canis familiaris similar to malic enzyme 3; NADP(+)-dependent; mitochondrial; transcript variant 1 (LOC485151); mRNA	99.103943	0.000512734	0.737489	-1.35595	XM_542269	Homo sapiens malic enzyme 3; NADP(+)-dependent; mitochondrial (ME3); nuclear gene encoding mitochondrial protein; transcript variant 1; mRNA	NM_006680	94.98208
PREDICTED: Canis familiaris similar to Interferon-induced protein with tetratricopeptide repeats 5 (IFIT-5) (Retinoic acid- and interferon-inducible 58 kDa protein) (LOC486788); mRNA	95.559846	0.000495289	3.37984	3.37984	XM_543917	Homo sapiens interferon-induced protein with tetratricopeptide repeats 5 (IFIT5); mRNA >gi|1144510|gb|U34605.1|HSU34605 Human retinoic acid- and interferon-inducible 58K protein RI58 mRNA; complete cds	NM_012420	92.27799
Synthetic construct Homo sapiens clone FLH189257.01X; RZPDo839D0374D PKM2 mRNA; complete sequence	97.790055	0.000488898	1.62476	1.62476	DQ892739	Synthetic construct Homo sapiens clone FLH189257.01X; RZPDo839D0374D PKM2 mRNA; complete sequence	DQ892739	97.79006
PREDICTED: Pan troglodytes etoposide induced 2.4; transcript variant 1 (EI24); mRNA	46.525097	0.000488481	0.677595	-1.47581	XM_001147121	NULL	NULL	NA
PREDICTED: Canis familiaris similar to CD59 antigen p18-20 (LOC475945); mRNA	20.272904	0.000487127	0.690112	-1.44904	XM_533156	Human DNA sequence from clone RP11-136K14 on chromosome 6 Contains three novel genes; the 5-prime end of a novel gene (contains FLJ31738 and KIAA1209) and a CpG island; complete sequence	AL450344	3.89864
PREDICTED: Canis familiaris similar to reticulocalbin 2 (LOC487666); mRNA	94.800693	0.000486882	0.66019	-1.51472	XM_544790	full-length cDNA clone CS0DI049YK06 of Placenta Cot 25-normalized of Homo sapiens (human)	CR626289	90.81456
PREDICTED: Bos taurus similar to Interleukin 6 signal transducer (gp130; oncostatin M receptor) (LOC522155);	12.690355	0.000422493	0.579601	-1.72532	XM_001100601	Human Meis1-related protein 2 (MRG2); mRNA; partial cds	U68385	8.46024

mRNA								
PREDICTED: Canis familiaris similar to WW domain binding protein 2; transcript variant 2 (LOC608477); mRNA	95.777351	0.000421214	1.999	1.999	XM_844270	Synthetic construct Homo sapiens clone FLH168862.01X; RZPDo839D1294D WBP2 mRNA; complete sequence	DQ891052	92.89827
Felis catus CXCR-4 homolog mRNA; complete cds	100	0.000399332	0.730116	-1.36965	U63558	NULL	NULL	NA
Felis catus Toll-like receptor 2 mRNA; partial cds	100	0.000391666	1.79388	1.79388	AY700369	Homo sapiens clone FLH166452.01L; RZPDo839H0185D TLR2 mRNA; partial sequence	DQ894005	84.53782
Pongo pygmaeus mRNA; cDNA DKFZp469M0635 (from clone DKFZp469M0635)	58.053097	0.000388473	0.765168	-1.3069	CR857728	NULL	NULL	NA
Felis catus clone vb15 T-cell receptor beta chain mRNA; partial cds	100	0.000367395	0.730589	-1.36876	AY316125	Homo sapiens T cell receptor beta variable region; Vbeta 5S1AT-PGQGAYEQYF-2.7 mRNA; partial cds	AF430648	66.66667
PREDICTED: Canis familiaris similar to uridine phosphorylase 1 (LOC480772); mRNA	86.587771	0.000366772	1.7344	1.7344	XM_537889	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Hypothetical UPF0049 protein ZK1128.2 in chromosome III; transcript variant 2 (LOC480655); mRNA	90.569395	0.000365505	0.660748	-1.51344	XM_863412	Macaca fascicularis testis cDNA clone: QtsA-10049; similar to human hypothetical protein MGC3329 (MGC3329); mRNA; RefSeq: NM_024086.2	AB168137	86.6548
Felis catus BCL2B-cell CLL/lymphoma 2 (BCL2); mRNA >gi|25166610|dbj|AB096611.1| Felis catus mRNA for bcl-2 protein; complete cds	86.222222	0.000350779	0.625335	-1.59914	NM_001009340	Homo sapiens B-cell CLL/lymphoma 2 (BCL2); nuclear gene encoding mitochondrial protein; transcript variant alpha; mRNA	NM_000633	79.77778
Sus scrofa mRNA; clone:AMP010093C02; expressed in alveolar macrophage	87.539936	0.000342523	0.678989	-1.47278	AK231094	NULL	NULL	NA
Homo sapiens WD repeat and FYVE domain containing 3 (WDFY3); transcript variant 1; mRNA	43.818182	0.00031426	1.55407	1.55407	NM_014991	Homo sapiens mRNA for KIAA0993 protein; partial cds	AB023210	43.81818
PREDICTED: Canis familiaris similar to Nonhistone chromosomal protein HMG-14 (High-mobility group nucleosome binding domain 1); transcript variant 2 (LOC608119); mRNA	93.735499	0.000294192	0.577286	-1.73224	XM_844714	PREDICTED: Homo sapiens similar to Nonhistone chromosomal protein HMG-14 (High-mobility group nucleosome-binding domain-containing protein 1) (LOC728851); mRNA	XM_001132231	65.89327
Homo sapiens cDNA FLJ39905 fis; clone SPLEN2017351; moderately similar to Xenopus laevis N-terminal acetyltransferase mRNA	66.109785	0.000292762	0.681524	-1.4673	AK097224	Homo sapiens cDNA FLJ39905 fis; clone SPLEN2017351; moderately similar to Xenopus laevis N-terminal acetyltransferase mRNA	AK097224	66.10979
PREDICTED: Canis familiaris similar to basic leucine zipper and W2 domains 2; transcript variant 1 (LOC475250); mRNA	96.930946	0.00028323	0.628615	-1.5908	XM_532484	Homo sapiens clone FLH186853.01L; RZPDo839B0362D BZW2 mRNA; partial sequence	DQ895708	95.39642

Homo sapiens zinc finger protein 642 (ZNF642); mRNA	54.51448	0.000270517	0.604648	-1.65385	XM_599813	Human DNA sequence from clone RP11-656D10 on chromosome 1 Contains the gene for a novel zinc finger protein; the gene for a novel protein and three novel genes; complete sequence	AL603839	54.51448
Homo sapiens ribosomal protein L36 (RPL36); transcript variant 1; mRNA	59.215017	0.000269341	0.704651	-1.41914	NM_033643	Homo sapiens ribosomal protein L36 (RPL36); transcript variant 1; mRNA	NM_033643	59.21502
Homo sapiens GPBP; DINB1 genes for Thr/Ser kinase; DINB1; partial cds	18.055556	0.000268377	0.385653	-2.593	AB036934	Homo sapiens chromosome 8; clone CTD-3107M8; complete sequence	AC109329	46.8254
PREDICTED: Canis familiaris similar to CG9882-PA (LOC475460); mRNA	92.943548	0.000251047	0.727037	-1.37545	XM_532684	Homo sapiens hypothetical protein BC004337 (LOC90826); mRNA >gi|39963106|gb|BC064403.1| Homo sapiens hypothetical protein BC004337; mRNA (cDNA clone MGC:75212 IMAGE:5547611); complete cds	NM_138364	87.70161
Mus musculus cDNA; RIKEN full-length enriched library; clone:M5C1025E14 product:SM-11044 binding protein; full insert sequence	41.078838	0.00024756	0.66585	-1.50184	NM_133352	NULL	NULL	NA
PREDICTED: Canis familiaris similar to Dickkopf related protein-3 precursor (Dkk-3) (Dickkopf-3) (hDkk-3) (LOC476857); mRNA	77.099237	0.000232116	0.474822	-2.10605	XM_534060	Homo sapiens dickkopf-3 (DKK-3) mRNA; complete cds	AF177396	31.48855
Homo sapiens PC4 and SFRS1 interacting protein 1 (PSIP1); transcript variant 2; mRNA >gi|3283351|gb|AF063020.1|AF063020 Homo sapiens lens epithelium-derived growth factor mRNA; complete cds	86.310905	0.00020451	0.604892	-1.65319	NM_033222	Homo sapiens lens epithelium-derived growth factor gene; alternatively spliced; complete cds	AF199339	86.31091
PREDICTED: Canis familiaris similar to ATP-binding cassette; sub-family A ; member 5; transcript variant 6 (LOC480455); mRNA	91.588785	0.000204232	0.65392	-1.52924	XM_857754	Homo sapiens mRNA for KIAA1888 protein; partial cds	AB067475	89.01869
PREDICTED: Canis familiaris similar to diacylglycerol kinase; alpha 80kDa; transcript variant 2 (LOC474393); mRNA	94.235033	0.00019439	0.671577	-1.48903	XM_531626	Homo sapiens clone 24 diacylglycerol kinase alpha (DAGK1) mRNA; complete cds	AF064771	86.91796
PREDICTED: Bos taurus similar to KIAA0863 protein (LOC504380); partial mRNA	87.265136	0.000186865	0.703183	-1.4221	XM_580489	Homo sapiens chromosome 18; clone; complete sequence	AC139100	86.8476
PREDICTED: Canis familiaris similar to ATP-binding cassette; sub-family A ; member 5; transcript variant 2 (LOC480455); mRNA	91.193738	0.000185605	0.693476	-1.44201	XM_857657	Homo sapiens ATP-binding cassette; sub-family A (ABC1); member 5 (ABCA5); transcript variant 2; mRNA	NM_172232	84.93151
PREDICTED: Canis familiaris similar to RAS guanyl releasing protein 1;	94.454383	0.000179175	0.686376	-1.45693	XM_535429	Homo sapiens calcium and DAG-regulated guanine nucleotide exchange factor II	AF081195	91.77102

transcript variant 2 (LOC478255); mRNA						mRNA; complete cds		
PREDICTED: Canis familiaris similar to SH3 domain-binding protein 5 (SH3 domain-binding protein that preferentially associates with BTK) (LOC485657); mRNA	93.691589	0.000143766	0.621661	-1.60859	XM_542777	Synthetic construct Homo sapiens clone FLH190536.01X; RZPDo839B0576D SH3BP5 mRNA; complete sequence	DQ892875	91.35514
Canis familiaris lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); mRNA >gi|46102472|gb|AY521549.1| Canis familiaris galectin 9 (UAT) mRNA; complete cds	85.17179	0.000114001	2.00711	2.00711	NM_001003345	Homo sapiens lectin; galactoside-binding; soluble; 9 (galectin 9) (LGALS9); transcript variant short; mRNA	NM_002308	76.1302
Bos taurus mRNA for similar to 40S ribosomal protein S18; partial cds; clone: ORCS10048	93.348624	0.000110672	0.730375	-1.36916	AB098889	Macaca fascicularis testis cDNA clone: QtsA-13881; similar to human ribosomal protein S18 (RPS18); mRNA; RefSeq: NM_022551.2	AB168656	92.43119
PREDICTED: Canis familiaris similar to DNA-binding protein SATB1 (Special AT-rich sequence binding protein 1) (LOC485650); mRNA	98.960499	0.000107709	0.542275	-1.84408	XM_542770	NULL	NULL	NA
Felis catus fms-related tyrosine kinase 3 ligand (FLT3LG); mRNA >gi|9367030|gb|AF155149.1|AF155149 Felis catus Flt3 ligand mRNA; complete cds	53.184165	0.000103573	0.766372	-1.30485	NM_001009842	Human FLT3/FLK2 ligand mRNA; complete cds	U04806	28.39931
Bos taurus mRNA for similar to 40S ribosomal protein S18; partial cds; clone: ORCS10048	93.348624	9.83E-05	0.733165	-1.36395	AB098889	Macaca fascicularis testis cDNA clone: QtsA-13881; similar to human ribosomal protein S18 (RPS18); mRNA; RefSeq: NM_022551.2	AB168656	92.43119
Felis catus mRNA for TCR alpha constant chain; partial cds	100	8.11E-05	0.57407	-1.74195	D69022	NULL	NULL	NA
PREDICTED: Canis familiaris similar to basic leucine zipper and W2 domains 2; transcript variant 1 (LOC475250); mRNA	62.146893	7.76E-05	0.603506	-1.65698	XM_857370	full-length cDNA clone CS0DI012YJ02 of Placenta Cot 25-normalized of Homo sapiens (human)	CR621525	61.01695
PREDICTED: Canis familiaris similar to Glucose-6-phosphate 1-dehydrogenase (G6PD) (LOC481088); mRNA	90.989399	5.51E-05	1.35837	1.35837	XM_538209	Homo sapiens clone FLH184178.01L; RZPDo839D01143D G6PD mRNA; partial sequence	DQ895415	89.39929
PREDICTED: Bos taurus similar to MMAC1 (LOC540786); mRNA	46.236559	4.84E-05	1.45046	1.45046	XM_613125	Macaca fascicularis testis cDNA; clone: QtsA-19057; similar to human phosphatase and tensin homolog (mutated in multipleadvanced cancers 1) (PTEN); mRNA; RefSeq: NM_000314.2	AB169328	45.3405
PREDICTED: Canis familiaris similar to Calcium/calmodulin-dependent protein	96.745562	2.50E-05	0.687345	-1.45487	XM_848313	Homo sapiens clone FLH182796.01L; RZPDo839C05139D CAMK2D mRNA;	DQ895255	95.56213

kinase type II delta chain (CaM-kinase II delta chain) (CaM kinase II delta subunit) (CaMK-II delta subunit) (LOC610764); mRNA						partial sequence		
Felis catus CD7 antigen (CD7); mRNA >gi|49022600|dbj|AB154850.1| Felis catus fCD7 mRNA for feline CD7; complete cds	100	2.48E-05	0.647573	1.54423	NM_001009296	Homo sapiens clone FLH187866.01L; RZPDo839D12149D CD7 mRNA; partial sequence	DQ895810	15.71125
PREDICTED: Canis familiaris similar to RAB6 interacting protein 1 (LOC476844); mRNA	93.846154	2.32E-05	1.3956	1.3956	XM_534048	Homo sapiens RAB6 interacting protein 1 (RAB6IP1); mRNA	NM_015213	45.98291
PREDICTED: Canis familiaris similar to SPARC precursor (Secreted protein acidic and rich in cysteine) (Osteonectin) (ON) (Basement-membrane protein 40) (BM-40) (LOC612159); mRNA	75.474957	6.00E-06	7.39773	7.39773	XM_849889	Macaca fascicularis brain cDNA; clone: QccE-10162; similar to human secreted protein; acidic; cysteine-rich (osteonectin)(SPARC); mRNA; RefSeq: NM_003118.1	AB169483	72.02073

FIGURE 6 p value < 0.01 FC >1.3

Figure 7
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Gene Name	Abbreviated Gene Name	Gene Accession numbers	Protein Accession numbers	Fold change in relative quantity at Day O of feeding study (NS= not significant).
Caspase 1	CASP1	AF135968	AAF64389.1	NS
Caspase 3	CASP3	AB090246	BAC10589.1	NS
Matrix metalloproteinase 2	MMP 2	AY250767	AAR03978.1	NS
Matrix metalloproteinase 16	MMP16	AY250763	AAR03975	NS
Inhibitor of Matrix Metalloproteinase 1	Inhibitor of MMP1	AY250764	AAR03976	NS
Inhibitor of Matrix Metalloproteinase 2	Inhibitor of MMP2	AY250765	Not Available	NS
Inhibitor of Matrix Metalloproteinase 3	Inhibitor of MMP3	AY250766	AAR03977	NS
Cysteine protease		AJ012326	CAB59816	NS
Punctuated (putative) metalloproteinase	PUMP-1	U04444	AAA18222.1	NS
Progesterone-dependent protein	PDP	M31652	AAA30816	NS

Figure 7
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Interferon-gamma	IFN-gamma	NM_001009873	NP_001009873	NS
Transforming Growth Factor-beta	TGF-beta	AY425617	AAQ99152	1.4
Interleukin-1 alpha	IL-1 alpha	NM_001009351	NP_001009351	2.2
Interleukin-1 beta	IL-1 beta	NM_001077414	NP_001070882	NS
Interleukin-2	IL-2	NM_001043337	NP_001036802	NS
Interleukin-6	IL-6	NM_001009211	NP_001009211	NS
Interleukin-10	IL-10	NM_001009209	NP_001009209	NS

FIGURE 7 Feline OA biomarkers qRT-PCR

Figure 8:

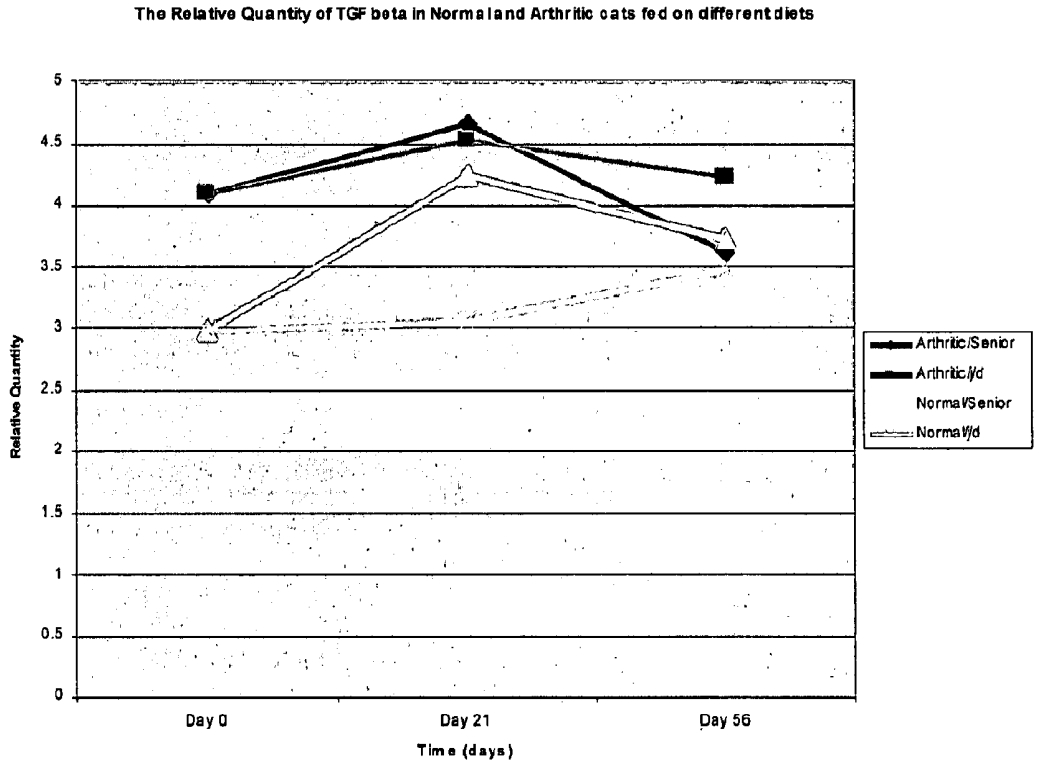

The Relative Quantity of TGF beta in Normal and Arthritic cats fed on different diets
Relative Quantity
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Day 0
Day 21
Day 56
Time (days)
Arthritic/Senior
Arthritic/j/d
Normal/Senior
Normal/j/d

Figure 9:

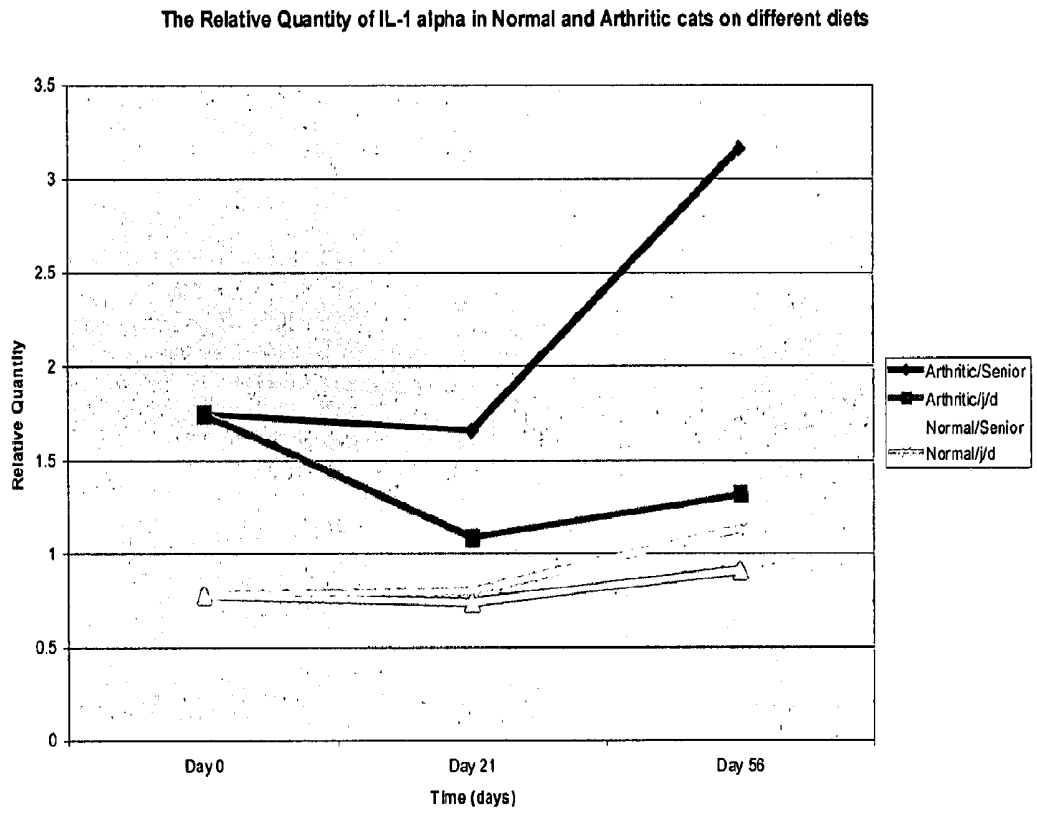

The Relative Quantity of IL-1 alpha in Normal and Arthritic cats on different diets
3.5
3
2.5
2
1.5
1
0.5
0
Relative Quantity
Day 0
Day 21
Day 56
Time (days)
Arthritic/Senior
Arthritic/j/d
Normal/Senior
Normal/j/d

Figure 10:

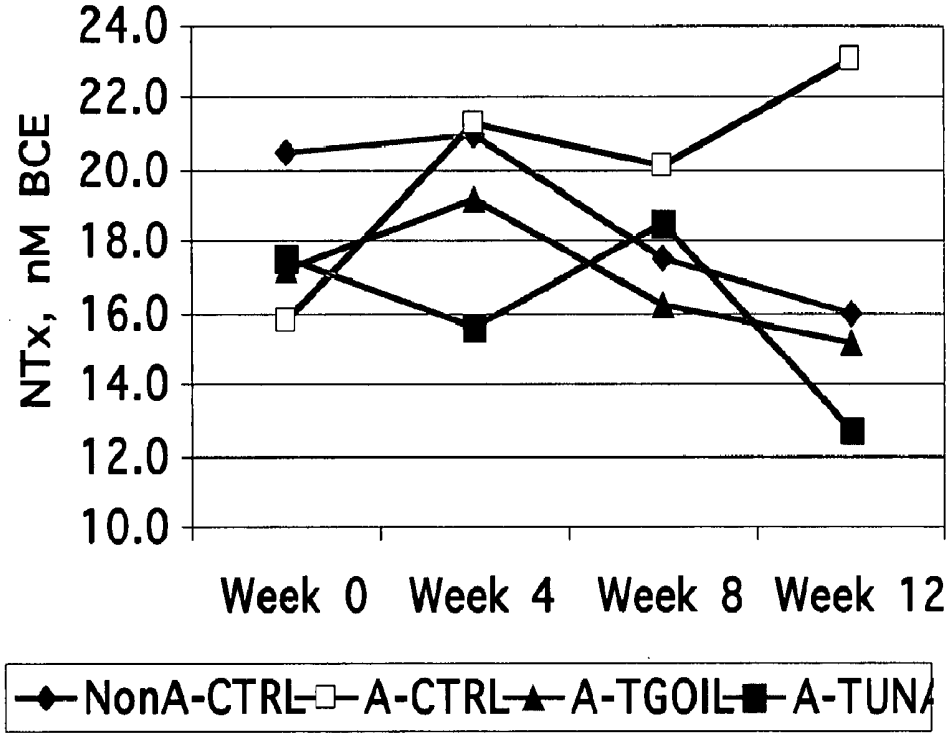
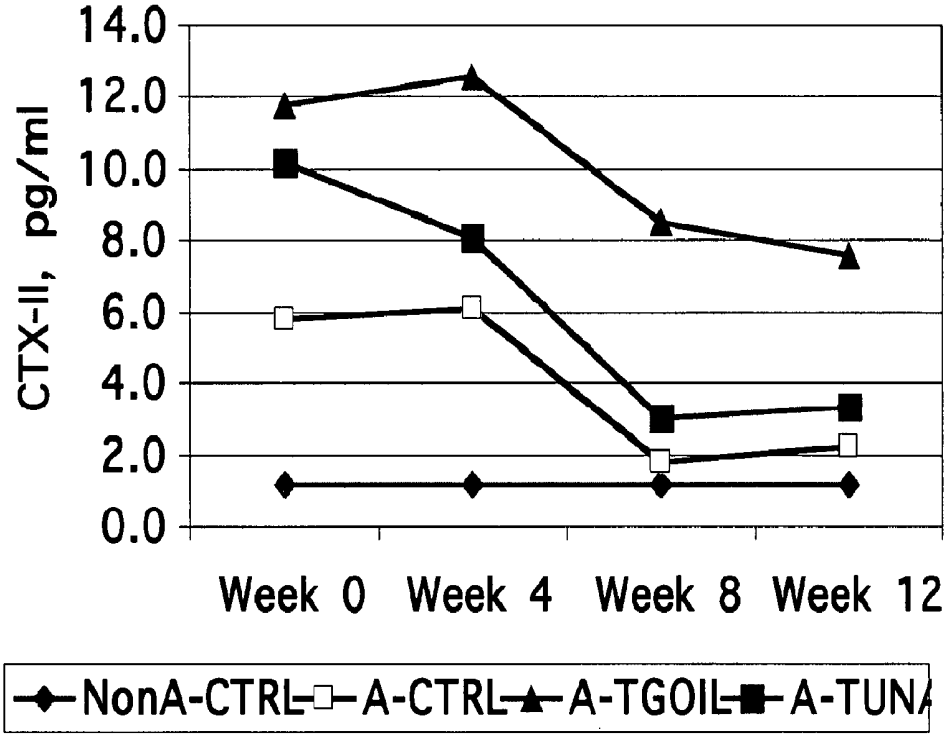

24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
NTx, nM BCE
Week 0
Week 4
Week 8
Week 12
NonA-CTRL
A-CTRL
A-TGOIL
A-TUN

Figure 11:


14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
CTX-II, pg/ml
Week 0
Week 4
Week 8
Week 12
NonA-CTRL
A-CTRL
A-TGOIL
A-TUNA

METHODS AND COMPOSITIONS FOR DIAGNOSING OSTEOARTHRITIS IN A FELINE

FIELD OF THE INVENTION

[0001] The present invention relates to the identification of novel osteoarthritic biomarkers in felines and diagnostic methods, compositions, and kits related thereto.

BACKGROUND OF THE INVENTION

[0002] Arthritis, more particularly osteoarthritis (OA), is a degenerative joint disease commonly occurring in humans and in companion animals. OA involves progressive deterioration of articular cartilage, with loss of proteoglycan and collagen and proliferation of new bone, accompanied by a variable inflammatory response within the synovial membrane. It is the most common form of joint and musculoskeletal disease affecting dogs, but cats may also suffer from this condition.

[0003] Feline OA is disease primarily affecting aged felines 10 years of age or older. Animals suffering from this disease characteristically jump less, reduce the height of their jumps or stop jumping entirely, avoid going up or down stairs, and tend to use their litter box less. Cats with OA also appear to be less friendly, exhibit changes in their sleep-wake patterns, and may have grooming problems. The management of OA in cats is similar to treatment regimens in other species which include environmental modification, treatment of obesity, controlled moderate exercise, pain control, and surgery.

[0004] Environmental modification begins with the placement of food bowls and litter pans in locations that do not require leaping or stair climbing. Small ramps can be built to a feeding station or into the litter box. The attempt is made by the pet owner to reduce large leaps up or down, to encourage moderate exercise, and to create an environment where the cat is not faced with an obstacle course to maintain a daily routine. Environmental modification does not slow the progression of the disease.

[0005] Overweight cats with OA can benefit from weight control. A reduction in body weight will alleviate the pressure and pain on the affected joint(s). Though weight loss in overweight or obese cats can help alleviate the pain caused by OA, it does not stop the progression of the disease.

[0006] Pain control in cats is a problem because drug regimens that are safe in other species are not necessarily safe in cats. Though many pharmaceutical companies are evaluating non-steroidal anti-inflammatory drugs (NSAIDs) in cats for treatment of pain, aspirin is the only NSAID for which a safe, chronic dose has been established in the cat. Corticosteroids have been used to alleviate pain and inflammation, but their use may cause progression of OA. NSAIDs may help alleviate pain but will not alter the progression of OA.

[0007] Nutraceuticals have been used to alleviate pain associated with OA in cats. Chondroitin sulfate and glucosamine HCl used in combination or separately have been used as a treatment regimen in cats. There are no published clinical studies that indicate these nutraceuticals alter the progression of OA. Recent data in humans indicates that chondroitin and glucosamine may help alleviate pain in humans with severe OA.

[0008] Although helpful in some respect to provide symptomatic relief, the approaches described above are not entirely successful in disease management, as they clearly do not treat the underlying pathology. Indeed, not only are improved treatment methods needed, but also improved methods to monitor the clinical progress of an animal with OA and even to diagnose an animal that has OA, and those that may be genetically predisposed to developing OA but do not as yet display any clinical signs of the disease. Currently, extensive radiographic tests must be carried out to confirm a diagnosis of OA in an animal and these tests are useful only to identify animals that have manifest joint and tissue damage. Thus, there is a need for a simple diagnostic test for detecting OA in felines, as well as improved methods for monitoring the clinical progress of an animal with OA.

BRIEF SUMMARY OF THE INVENTION

[0009] The current invention relates to the identification of novel biomarkers for OA in felines and methods for the detection of arthritic animals based on a characteristic pattern of gene expression for these OA biomarkers in vivo. Specifically, the methods of the invention comprise detecting differential expression, compared to a control expression level, of at least one biomarker, in a body sample, preferably a blood sample, wherein the detection of differential expression of said biomarker specifically identifies animals that have OA. Thus, the method relies on the detection of at least one biomarker that is differentially expressed in OA in comparison to cells from normal, or control, animals.

[0010] The biomarkers of the invention are proteins and/or nucleic acids that are differentially expressed in OA in felines. In one aspect, the biomarkers of particular interest include the biomarkers listed herein on FIGS. **1-7**.

[0011] Biomarker expression can be assessed at the protein or nucleic acid level using various methods. Thus, in another aspect, the invention relates to methods that utilize antibodies to detect the expression of OA biomarker proteins in feline samples. In this aspect of the invention, at least one antibody directed to a specific OA biomarker of interest is used. In a further aspect, expression levels can also be detected by nucleic acid-based techniques, including, for example, hybridization, microarray technologies and RT-PCR, including quantitative RT-PCR. Mass spectrometry, fluorescence activated cell sorting (FACS) or Luminex Xmap® bead technology may also be used to detect expression levels at both the protein or nucleic acid level.

[0012] It is further contemplated herein that the methods of the present invention may be used in combination with traditional diagnostic techniques that are able to detect the physical and morphological characteristics of degenerative joint disease. Thus, for example, the characterization of differential expression in genes for OA biomarkers in cells obtained from a blood sample of an animal may be combined with conventional diagnostic (e.g., radiological) techniques in order to corroborate a diagnosis of OA.

[0013] In a further aspect, the invention relates to compositions comprising one or more nucleic acid probes that specifically hybridize to a nucleic acid, or fragment thereof, encoding an OA biomarker of the present invention.

[0014] In an additional aspect, the invention relates to compositions comprising antibodies that specifically bind to a polypeptide encoded by a gene of an OA biomarker of the present invention.

[0015] The invention also relates to kits to diagnose OA in a feline comprising components that can be used to detect

expression of the OA biomarkers of the present invention, including, but not limited to, the compositions and microarrays described herein.

[0016] It is also contemplated herein that the present invention relates to the use of the OA biomarkers and compositions disclosed herein in methods to diagnose OA in a feline.

[0017] In another aspect, it is also contemplated herein that the invention relates to methods for identifying bioactive dietary components or other natural compounds (referred to hereafter as "components") that may be tested for an ability to treat or ameliorate osteoarthritis in a feline comprising: (a) contacting a cell capable of expressing an RNA or protein product of one or more OA biomarkers disclosed in FIGS. **1-7** with a test component: (b) determining the amount of said RNA and/or product produced in the cells contacted with the test component; and (c) comparing the amount of said RNA and/or protein product in the cells contacted with the test component to the amount of the same said RNA or protein product present in a corresponding control cell that has not been contacted with the test component; wherein if amount of the RNA or protein product is altered relative to the amount in the control, the component is identified as one to be tested for an ability to treat or ameliorate osteoarthritis in a feline.

BRIEF DESCRIPTION OF THE FIGURES

[0018] FIG. **1** discloses feline OA biomarkers identified based on a selection criteria wherein the p value <0.001 and expression levels display a fold change of >2.0. With regard to FIGS. **1** and FIGS. **2-6** as well, where mean-ratio >1, the gene is up regulated in OA and equates to a positive fold change. In contrast, where mean-ratio <1, the gene is down regulated in OA animals and equates to a negative fold change.

[0019] FIG. **2** discloses feline OA biomarkers identified based on a selection criteria wherein the p value <0.001 and expression levels display a fold change of >1.5.

[0020] FIG. **3** discloses feline OA biomarkers identified based on a selection criteria wherein the p value <0.001 and expression levels display a fold change of >1.3.

[0021] FIG. **4** discloses feline OA biomarkers identified based on a selection criteria wherein the p value <0.01 and expression levels display a fold change of >2.0.

[0022] FIG. **5** discloses feline OA biomarkers identified based on a selection criteria wherein the p value <0.01 and expression levels display a fold change of >1.5.

[0023] FIG. **6** discloses feline OA biomarkers identified based on a selection criteria wherein the p value <0.01 and expression levels display a fold change of >1.3.

[0024] FIG. **7** discloses feline OA biomarkers identified based on an analysis of feline data using qRT-PCR.

[0025] FIG. **8** discloses relative quantity of TGF-beta in normal and arthritic cats fed different diets. With regard to FIG. **8** and FIGS. **9-11**, as indicated, "j/d" and "senior" refer to diets containing different amounts of omega-3 fatty acids as disclosed in WO 2007/002837 A2 and WO 2006/074089 A2, respectively.

[0026] FIG. 9 depicts the relative quantity of IL-1 alpha in normal and arthritic cats on j/d and senior diets.

[0027] FIG. **10** depicts levels of NTx in cats fed diets high in EPA and DHA. Levels are detected using conventional ELISA methods.

[0028] FIG. **11** depicts levels of CTX-II in cats fed diets high in EPA and DHA. Levels are detected using conventional ELISA methods.

DETAILED DESCRIPTION OF THE INVENTION

[0029] The present invention provides compositions and methods for identifying or diagnosing osteoarthritis in felines. The methods comprise the detection of the differential expression of specific biomarkers that are either selectively over expressed or under expressed in osteoarthritis. In this way, the biomarkers of the invention are capable of distinguishing between animals that have OA and those that do not. It is also contemplated herein that it may be possible to identify those animals that may be predisposed to developing OA or those that have OA but have not yet manifested morphological or physical changes. Said methods for diagnosing osteoarthritis involve detecting the differential expression of at least one biomarker that is indicative of osteoarthritis in a tissue or body fluid sample from a feline. In particular embodiments, antibodies and immunocytochemistry techniques or nucleic acid probes and hybridization techniques are used to detect expression of the biomarker of interest. Kits for practicing the methods of the invention are further provided.

[0030] "Diagnosing osteoarthritis" is intended to include, for example, diagnosing or detecting the presence of OA or a genetic predisposition thereto, monitoring the progression of the disease, and effectiveness of therapeutic intervention, as well as identifying or detecting cells or samples that are indicative of osteoarthritis. The terms diagnosing, detecting, and identifying osteoarthritis are used interchangeably herein. By "osteoarthritis" is intended those conditions characterized by degeneration of articular cartilage on the ends of bones that forms the surface of the joints and which may include, in later stages, accompanying changes in surrounding tissue in and around joints, e.g., bone, muscle, ligaments, menisci and synovium. Such physical changes are manifested by pain, swelling, weakness and loss of joint function.

[0031] OA has been classified into various grades or stages. Stage 1 is characterized by changes in chondrocyte metabolism such that there is an increase in cartilage matrix destroying enzymes such as metalloproteases. Protease inhibitors are synthesized in insufficient levels to combat the breakdown of the cartilage matrix. Stage 2 is characterized by erosion of the cartilage surface which causes a detectable increase in levels of proteoglycan and collagen fragments in the synovial fluid. During stage 3, the synovium is chronically inflamed, as a result of the breakdown products of cartilage. Macrophages in the synovium produce cytokines which can damage cartilage by directly destroying tissue or stimulating the chondrocytes to produce more metalloproteinases. Pro-inflammatory molecules may also cause damage at this stage. The resulting damage to the joint triggers an increase in bone growth as the body attempts to stabilize the joint, thus changing the normal mechanical and architectural features of the joint.

[0032] As discussed above, it is contemplated that the methods of the present invention may permit the identification of felines that may be predisposed to developing OA in future. In these animals it is contemplated that the methods of the present invention may be particularly useful, since conventional methods that rely on morphological changes to joint tissue would not typically identify these patients as being in need of therapeutic intervention. Use of haplotype markers and single nucleotide polymorphisms (SNPs) of the

OA biomarkers disclosed herein may be particularly useful in this regard. In these cases, prophylactic measures or other therapies may be started as a means to ward off the more debilitating symptoms or physical damage associated with the later stages of OA.

[0033] In addition, it is contemplated herein while the OA biomarkers disclosed herein may be useful to diagnose a feline with OA, the OA biomarkers may also be useful targets for therapeutic intervention. For example, it is contemplated herein that a therapeutic benefit may be achieved prior to the manifestation of pathological physical changes in a feline (or even after physical changes have occurred), by altering the expression of any one or more of the biomarkers described in FIGS. **1-7** provided herein, e.g., by decreasing expression levels of genes overexpressed in OA, and/or by increasing expression in genes that are underexpressed in OA. In the case of some biomarkers as described in detail in the Examples below, this may be achieved by administration of a formulation high in EPA and DHA to a feline in need thereof.

[0034] It is further contemplated herein that components that may be of use to treat or ameliorate OA in felines may be identified by exposing cells to test components in vitro and assaying for changes in gene expression of one or more of the OA biomarkers. Such in vitro assays are familiar to one of skill in the art and may be performed according to conventional methods. Primary cultures of feline cells may be used as well as cell lines isolated from different feline tissues such as, e.g., blood, kidney, brain, tongue or lung. Feline cells for in vitro analysis may be obtained commercially, e.g. from American Type Culture Collection (ATCC, Manassas, Va.). Candidate components which show potential to influence the expression of OA biomarkers can then be slated for further experimentation, including as components of pet food formulations such as described in the Examples below.

[0035] While not intending to be limited to a particular mechanism, it is contemplated herein that the genotypic fingerprint of osteoarthritis in felines may be characterized by the differential expression of discrete genes, or biomarkers. The use of these molecular biomarkers of OA in molecular diagnostic assay formats can improve the detection of OA compared to current methods. Thus, in particular embodiments, a method for diagnosing osteoarthritis comprises detecting differential expression of a biomarker, wherein differential expression of the biomarker may be indicative of a disruption in a biochemical pathway related to or associated with OA. e.g., either as cause or effect. In still other embodiments, the methods comprise detecting differential expression of one or more OA biomarkers, e.g., a subset of biomarkers provided herein on FIGS. **1-7**. In this way, the methods of the present invention may not only permit the identification of an animal with osteoarthritis, but may also allow identification of an animal who may be genetically predisposed to developing OA.

[0036] The methods disclosed herein provide superior detection of osteoarthritis in comparison to conventional diagnostic testing. "Conventional methods to diagnose OA" are familiar to one of skill in the art and include X-ray, magnetic resonance imaging or the use of ultrasound. In particular aspects of the invention, the accuracy of the present methods are equal to or greater than that of conventional radiological or magnetic resonance testing used to detect the presence of OA.

[0037] The biomarkers of the present invention include genes and proteins, and variants and fragments thereof. Such biomarkers include polynucleotides, e.g, DNA comprising the entire or partial sequence of the nucleic acid sequence encoding the biomarker, or the complement of such a sequence. Biomarker polynucleotides may also include RNA comprising the entire or partial sequence of any of the nucleic acid sequences of interest. A biomarker protein is a protein encoded by or corresponding to a DNA biomarker of the invention. A biomarker protein comprises the entire or partial amino acid sequence of any of the biomarker proteins or polypeptides disclosed herein.

[0038] A "biomarker" is any gene or protein whose level of expression in a tissue or cell is altered compared to that of a normal or healthy cell or tissue. Biomarkers of the present invention are differentially expressed in felines with osteoarthritis. By "differentially expressed in osteoarthritis" is intended that the gene expression levels of the biomarkers of interest are either up or down regulated in a subject having, or predisposed to having, osteoarthritis compared to levels in a control subject. i.e., a subject not having or predisposed to having the condition. It is contemplated herein that detection of the biomarkers of the invention not only permits the identification of a subject having OA, but may also provide a means to identify an animal predisposed to developing this condition, ideally before physical symptoms manifest. If possible, such early detection would allow for improved patient care and could possibly prevent disease associated irreversible joint damage.

[0039] In some embodiments, the methods for diagnosing osteoarthritis disclosed herein may be performed as a primary means to screen for osteoarthritis in a feline. Said feline may be screened as part of a routine physical evaluation. A feline may also be screened according to the methods of the present invention because information indicates that the feline may be genetically predisposed to OA based on the medical history of its dam and/or sire, or because the feline is suspected to have the condition based on observed changes in behavior patterns. The methods of the present invention may also be used as part of a clinical examination in conjunction with conventional methods for diagnosing OA in a feline, e.g. X-ray or MRI, when said conventional methods are inconclusive or when confirmation of a diagnosis based on conventional techniques is desired.

[0040] The biomarkers of the invention include any polynucleotide or protein that is selectively differentially expressed in osteoarthritis, as defined herein above. Although any biomarker indicative of osteoarthritis may be used in the present invention, in certain embodiments the biomarkers include any one or more, or subsets of biomarkers set forth herein on FIGS. **1-7**.

[0041] Although the methods of the invention require the detection of at least one biomarker in a patient sample for the detection of osteoarthritis, it is contemplated herein that several or more biomarkers may be used to practice the present invention. Therefore, in some embodiments, one or more biomarkers are used, more preferably, two or more complementary biomarkers. By "complementary" is intended that detection of the combination of biomarkers in a body sample results in the successful identification of osteoarthritis in a greater percentage of cases than would be identified if only one of the biomarkers was used. Thus, in some cases, a more accurate determination of osteoarthritis can be made by using at least two biomarkers. Accordingly, where at least two biomarkers are used, at least two antibodies directed to distinct biomarker proteins can be used to practice the diagnostic

methods disclosed herein. For example, antibodies or nucleic acid probes may be contacted with a body sample simultaneously or concurrently.

[0042] In particular embodiments, the diagnostic methods of the invention comprise collecting a blood sample from a feline patient, contacting the sample with at least one antibody specific for a biomarker of interest, and detecting antibody binding. Samples that exhibit differential expression of a biomarker of the invention, as determined by detection of antibody binding, are deemed positive for osteoarthritis. In particular embodiments, the body sample is a blood sample obtained from a feline by conventional methods such as density gradient separation methods, e.g., Ficoll-hypaque technique, or using cell preparation tubes (CPT™ tubes) from Becton Dickinson or other methods familiar to one of skill in the art.

[0043] By "body sample" is intended any sampling of cells, tissues, or bodily fluids in which expression of a biomarker can be detected. Examples of such body samples include, but are not limited to, blood, lymph, urine, biopsies, and smears. Body samples may be obtained from a feline by a variety of techniques including, for example, by scraping or swabbing an area or by using a needle to aspirate bodily fluids. Methods for collecting various body samples are well known in the art. In particular embodiments, the body sample comprises blood cells.

[0044] Any methods available in the art for identification or detection of the OA biomarkers of the present invention are encompassed herein. The differential expression of a biomarker of the invention can be detected on a nucleic acid level or a protein level. As described above, in order to determine differential expression, the body sample to be examined may be compared with a corresponding body sample that originates from a healthy subject. That is, the "normal" level of expression is the level of expression of the biomarker in the cells of a subject feline not afflicted with or predisposed to osteoarthritis. In some cases where the ratio of expression of a biomarker in an arthritic animal compared to a control is known, differential expression of said biomarker may be characterized in an animal without direct comparison to a normal.

[0045] Methods for detecting biomarkers of the invention comprise any methods that determine the quantity or the presence of the biomarkers either at the nucleic acid or protein level. Such methods are well known in the art and include but are not limited to Western blots, Northern blots, Southern blots, ELISA, immunoprecipitation, immunofluorescence, flow cytometry, immunocytochemistry, nucleic acid hybridization techniques, nucleic acid reverse transcription methods, and nucleic acid amplification methods. In particular embodiments, differential expression of a biomarker is detected on a protein level using, for example, antibodies that are directed against specific biomarker proteins. These antibodies can be used in various methods such as Western blot, ELISA, immunoprecipitation, or immunocytochemistry techniques. In addition, data from conventional diagnostic imaging using X-ray, or magnetic resonance may be obtained and compared to the immunocytochemical or nucleic acid probe hybridization information. In this manner, the detection of the biomarkers can confirm results from conventional diagnostic methods or provide clarity when data from conventional methods are inconclusive.

[0046] In one embodiment, antibodies specific for biomarker proteins are utilized to detect the differential expression of a biomarker protein in a body sample. The method comprises obtaining a body sample from a subject, contacting the body sample with at least one antibody directed to a biomarker that is selectively differentially expressed in osteoarthritis, and detecting antibody binding to determine if the biomarker is similarly differentially expressed in the sample. A preferred aspect of the present invention provides an immunocytochemistry technique for diagnosing osteoarthritis using a blood sample from a subject.

[0047] In a preferred immunocytochemical method, a blood sample is collected from a subject using methods familiar to one of skill in the art. For example, as described in the examples provided herein. PAXgene blood RNA tubes (for use in PAX gene blood RNA isolation) may also he employed where isolation of nucleic acid is desired. The blood sample may be assayed immediately or stored under appropriate conditions familiar to one of skill in the art for later analysis.

[0048] Alternatively, an antibody, particularly a monoclonal antibody, directed to a biomarker of interest may be incubated with a blood sample from a subject. As noted above, one of skill in the art will appreciate that a more accurate diagnosis of osteoarthritis may be obtained in some cases by detecting more than one biomarker in a patient sample. Therefore, in particular embodiments, at least two antibodies directed to two distinct biomarkers are used to detect osteoarthritis. Where more than one antibody is used, these antibodies may be added to a single sample sequentially as individual antibody reagents or simultaneously as an antibody cocktail. Alternatively, each individual antibody may be added to a separate sample from the same patient, and the resulting data pooled. In particular embodiments, an antibody cocktail may comprises several antibodies, wherein said antibodies bind to, e.g., a subset of the OA biomarkers disclosed in FIGS. **1-7**.

[0049] The terms "antibody" and "antibodies" broadly encompass naturally occurring forms of antibodies and recombinant antibodies such as single-chain antibodies, chimeric and humanized antibodies and multi-specific antibodies as well as fragments and derivatives of all of the foregoing, which fragments and derivatives have at least an antigenic binding site. Fully assembled antibodies and antibody fragments that can bind antigen are included in this definition. Antibody derivatives may comprise a protein or chemical moiety conjugated to the antibody.

[0050] "Antibody fragments" comprise a portion of an intact antibody, preferably the antigen-binding or variable region of the intact antibody. Examples of antibody fragments include Fab, Fab', $F(ab')_2$, and Fv fragments: diabodies; linear antibodies (Zapata et al. (1995) Protein Eng. 8(10):1057 1062); single-chain antibody molecules; and multispecific antibodies formed from antibody fragments. Papain digestion of antibodies produces two identical antigen-binding fragments, called "Fab" fragments, each with a single antigen-binding site, and a residual "Fc" fragment. Pepsin treatment yields an $F(ab')_2$ fragment that has two antigen-combining sites and is still capable of cross-linking antigen. Described herein are methods for the production of antibodies capable of specifically recognizing one or more differentially expressed gene epitopes. Such antibodies may include, but are not limited to, polyclonal antibodies, monoclonal antibodies (mAbs), humanized or chimeric antibodies, single chain antibodies. Fab fragments, $F(ab')_2$ fragments. frag-

ments produced by a Fab expression library, anti-idiotypic (anti-Id) antibodies, and epitope-binding fragments of any of the above.

[0051] For the production of antibodies to a differentially expressed gene, various host animals may be immunized by injection with a differentially expressed gene protein, or a portion thereof. Such host animals may include but are not limited to rabbits, mice, rats, and chickens to name but a few. Various adjuvants may be used to increase the immunological response, depending on the host species, including but not limited to Freund's (complete and incomplete), mineral gels such as aluminum hydroxide, surface active substances such as lysolecithin, pluronic polyols, polyanions, peptides, oil emulsions, keyhole limpet hemocyanin, dinitrophenol, and potentially useful human adjuvants such as BCG (bacille Calmette-Guerin) and *Corynebacterium parvum.*

[0052] Polyclonal antibodies are heterogeneous populations of antibody molecules derived from the sera of animals immunized with an antigen, such as target gene product, or an antigenic functional derivative thereof. For the production of polyclonal antibodies, host animals such as those described above may be immunized by injection with differentially expressed gene product, supplemented with adjuvants as also described above.

[0053] Monoclonal antibodies, which are homogeneous populations of antibodies to a particular antigen, may be obtained by any technique that provides for the production of antibody molecules by continuous cell lines in culture. These include, but are not limited to the hybridoma technique of Kohler and Milstein, (1975, Nature 256:495-497: and U.S. Pat. No. 4,376,110), the human B-cell hybridoma technique (Kosbor et al., 1983, Immunology Today 4:72: Cole et al., 1983, Proc. Natl. Acad. Sci. USA 80:2026-2030), and the EBV-hybridoma technique (Cole et al., 1985, Monoclonal Antibodies And Cancer Therapy, Alan R. Liss, Inc., pp. 77-96). Such antibodies may be of any immunoglobulin class including IgG, IgM, IgE, IgA, IgD and any subclass thereof. The hybridoma producing the mAb of this invention may be cultivated in vitro or in vivo.

[0054] In addition, techniques developed for the production of "chimeric antibodies" (Morrison et al., 1984, Proc. Natl. Acad. Sci., 81:6851-6855: Neuberger et al., 1984. Nature, 312:604-608; Takeda et al., 1985, Nature. 314:452-454) by splicing the genes from a mouse antibody molecule of appropriate antigen specificity together with genes from a human antibody molecule of appropriate biological activity, can be used. A chimeric antibody is a molecule in which different portions are derived from different animal species, such as those having a variable or hypervariable region derived from a murine mAb and a human immunoglobulin constant region.

[0055] Alternatively, techniques described for the production of single chain antibodies (U.S. Pat. No. 4,946,778: Bird, 1988, Science 242:423-426: Huston et al., 1988, Proc. Natl. Acad. Sci. USA 85:5879-5883; and Ward et al., 1989, Nature 334:544-546) can be adapted to produce differentially expressed gene-single chain antibodies. Single chain antibodies are formed by linking the heavy and light chain fragments of the Fv region via an amino acid bridge, resulting in a single chain polypeptide.

[0056] Most preferably, techniques useful for the production of "humanized antibodies" can be adapted to produce antibodies to the polypeptides, fragments, derivatives, and functional equivalents disclosed herein. Such techniques are well known to those of skill in the art and are disclosed in. e.g., U.S. Pat. Nos. 5,932,448: 5.693,762: 5,693,761; 5,585,089; 5,530,101; 5,910,771: 5,569,825; 5.625.126: 5,633,425; 5.789,650; 5,545,580: 5,661.016; and 5,770,429, the disclosures of all of which are incorporated by reference herein in their entirety.

[0057] Antibody fragments which recognize specific epitopes may be generated by known techniques. For example, such fragments include but are not limited to: the $F(ab')_2$ fragments which can be produced by pepsin digestion of the antibody molecule and the Fab fragments which can be generated by reducing the disulfide bridges of the $F(ab')_2$ fragments. Alternatively, Fab expression libraries may be constructed (Huse et al., 1989, Science, 246:1275-1281) to allow rapid and easy identification of monoclonal Fab fragments with the desired specificity. Particularly preferred, for ease of detection, is the sandwich assay, of which a number of variations exist, all of which may be employed in the methods of the present invention. Specifically, Elisa methods, including standard, sandwich and microformat Elisa methodologies familiar to one of skill in the art, may be used.

[0058] In some cases, an unlabeled antibody is immobilized on a solid substrate and the sample to be tested brought into contact with the bound molecule. After a suitable period of incubation, for a period of time sufficient to allow formation of an antibody-antigen binary complex, a second antibody, labeled with a reporter molecule capable of inducing a detectable signal, is then added and incubated, allowing time sufficient for the formation of a ternary complex of antibody-antigen-labeled antibody. Any unreacted material is washed away, and the presence of the antigen is determined by observation of a signal, or may be quantitated by comparing with a control sample containing known amounts of antigen. Variations include a simultaneous assay, in which both sample and antibody are added simultaneously to the bound antibody, or an assay in which the labeled antibody and sample to be tested are first combined, incubated and added to the unlabeled surface bound antibody. These techniques are well known to those skilled in the art, and the possibility of minor variations will be readily apparent.

[0059] The most commonly used reporter molecules in this type of assay are either enzymes, fluorophore- or radionuclide-containing molecules. In the case of an enzyme immunoassay, an enzyme is conjugated to the second antibody, usually by means of glutaraldehyde or periodate. As will be readily recognized, however, a wide variety of different ligation techniques exist, which ae well-known to the skilled artisan. Commonly used enzymes include horseradish peroxidase, glucose oxidase, beta-galactosidase and alkaline phosphatase, among others. The substrates to be used with the specific enzymes are generally chosen for the production, upon hydrolysis by the corresponding enzyme, of a detectable color change. For example, p-nitrophenyl phosphate is suitable for use with alkaline phosphatase conjugates; for peroxidase conjugates, 1,2-phenylenediamine or toluidine are commonly used. It is also possible to employ fluorogenic substrates, which yield a fluorescent product rather than the chromogenic substrates noted above. Spectophotometric methods may also be used to evaluate the presence of antigen in the serum sample.

[0060] Alternately, fluorescent compounds, such as fluorescein and rhodamine, may be chemically coupled to antibodies without altering their binding capacity. When activated by illumination with light of a particular wavelength, the fluorochrome-labeled antibody absorbs the light energy,

inducing a state of excitability in the molecule, followed by emission of the light at a characteristic longer wavelength. The emission appears as a characteristic color visually detectable with a light microscope. Immunofluorescence and EIA techniques are both very well established in the art and are particularly preferred for the present method. However, other reporter molecules, such as radioisotopes, chemiluminescent or bioluminescent molecules may also be employed. It will be readily apparent to the skilled artisan how to vary the procedure to suit the required use.

[0061] With regard to detection of antibody staining in the immunocytochemistry methods of the invention, there also exist in the art video-microscopy and software methods for the quantitative determination of an amount of multiple molecular species (e.g., biomarker proteins) in a biological sample wherein each molecular species present is indicated by a representative dye marker having a specific color. Such methods are also known in the art as calorimetric analysis methods. In these methods, video-microscopy is used to provide an image of the biological sample after it has been stained to visually indicate the presence of a particular biomarker of interest. Some of these methods, such as those disclosed in U.S. Pat. No. 7,065,236, incorporated herein by reference, disclose the use of an imaging system and associated software to determine the relative amounts of each molecular species present based on the presence of representative color dye markers as indicated by those color dye markers' optical density or transmittance value, respectively, as determined by an imaging system and associated software. These techniques provide quantitative determinations of the relative amounts of each molecular species in a stained biological sample using a single video image that is "deconstructed" into its component color parts.

[0062] The antibodies used to practice the invention are selected to have high specificity for the biomarker proteins of interest. While methods for making antibodies and for selecting appropriate antibodies are known in the art and described above, it is also contemplated herein that in some embodiments, commercial antibodies directed to specific biomarker proteins may be used to practice the invention.

[0063] One of skill in the art will recognize that the concentration of a particular antibody used to practice the methods of the invention may vary depending on such factors as time for binding, level of specificity of the antibody for the biomarker protein, and method of body sample preparation. Moreover, when multiple antibodies are used, the required concentration may be affected by the order in which the antibodies are applied to the sample, i.e., simultaneously as a cocktail, or sequentially as individual antibody reagents. Furthermore, the detection chemistry used to visualize antibody binding to a biomarker of interest must also be optimized to produce the desired signal to noise ratio.

[0064] In other embodiments, the expression of a biomarker of interest is detected at the nucleic acid level. Nucleic acid-based techniques for assessing expression are well known in the art and include, for example, determining the level of biomarker mRNA in a body sample. Many expression detection methods use isolated RNA. As used herein, "RNA" includes total RNA as well as mRNA. Any RNA isolation technique that does not select against the isolation of mRNA can be utilized for the purification of RNA from blood cells (see, e.g., Ausubel et al., ed., (1987 1999) Current Protocols in Molecular Biology (John Wiley & Sons. New York). Additionally, large numbers of tissue samples can readily be processed using techniques well known to those of skill in the art. such as, described in U.S. Pat. No. 4,843.155.

[0065] The term "probe" refers to any molecule that is capable of selectively binding to a specifically intended target biomolecule, for example, a nucleotide transcript or a protein encoded by or corresponding to an OA biomarker. Probes can be synthesized by one of skill in the art, or derived from appropriate biological preparations. Probes may be specifically designed to be labeled. Examples of molecules that can be utilized as probes include, but are not limited to, RNA, DNA, proteins, antibodies, and organic molecules.

[0066] Isolated mRNA can be used in hybridization or amplification assays that include, but are not limited to, Southern or Northern analyses, polymerase chain reaction analyses and probe arrays. One method for the detection of mRNA levels involves contacting the isolated mRNA with a nucleic acid molecule (probe) that can hybridize to the mRNA encoded by the gene being detected. The nucleic acid probe can be, for example, a full-length cDNA, or a portion thereof such as an oligonucleotide of at least 7, 15, 30, 50, 100, 250 or 500 nucleotides in length and sufficient to specifically hybridize under stringent conditions to an mRNA or genomic DNA encoding a biomarker of the present invention. Hybridization of an mRNA with the probe indicates that the biomarker in question is being expressed.

[0067] In one embodiment, the mRNA is immobilized on a solid surface and contacted with a probe, for example by running the isolated mRNA on an agarose gel and transferring the mRNA from the gel to a membrane, such as nitrocellulose. A skilled artisan can readily adapt known mRNA detection methods for use in detecting the level of mRNA encoded by the biomarkers of the present invention.

[0068] In an alternative embodiment, the probe(s) for an OA biomarker are immobilized on a solid surface and the mRNA is contacted with the probe(s). As contemplated herein, gene chips, (e.g., high density oligonucleotide arrays), microarrays (e.g., cDNA arrays or oligonucleotide arrays printed on glass slides), macroarrays, (e.g., PVDF membranes on which genes are printed) and bead-based arrays (e.g. Illumina bead based microarrays) are among the possible assay platforms that may be used in the methods of the present invention. Thus, in one embodiment of the invention, microarrays are used to detect biomarker expression, and such methods are useful to detect expression levels of a number of different genes. Microarray technologies, e.g., such as commercially available from Affymetrix, are familiar to one of skill in the art. It is contemplated herein that microarrays or "chips" designed for the detection of expression of the OA biomarkers disclosed herein may be created for use in the methods of the present invention. As used herein, "microarray" is meant to include all array platform technologies, which may include, e.g., gene chips, or bead arrays, and may include peptides or nucleic acids, e.g., RNA, DNA, cDNA, PCR products or ESTs, on beads, gels, polymeric surfaces, fibers such as fiber optics, glass or any other appropriate substrate.

[0069] An alternative method for determining the level of biomarker mRNA in a sample involves the process of nucleic acid or oligonucleotide amplification, e.g., by RT-PCR, including quantitative or qRT-PCR, ligase chain reaction (Barany (1991) Proc. Natl. Acad. Sci. USA 88:189 193), self sustained sequence replication (Guatelli et al. (**1990**) Proc. Natl. Acad. Sci. USA 87:1874 1878). transcriptional amplification system (Kwoh et al. (1989) Proc. Natl. Acad. Sci.

USA 86:1173 1177). Q-Beta Replicase (Lizardi et al. (1988) Bio/Technology 6:1197), rolling circle replication or any other nucleic acid amplification method, followed by the detection of the amplified molecules using techniques well known to those of skill in the art. These detection schemes are especially useful for the detection of nucleic acid molecules if such molecules are present in very low numbers. In particular aspects of the invention. biomarker expression is assessed by quantitative RT-PCR.

[0070] Biomarker expression levels of RNA may be monitored using conventional methods, e.g. a membrane blot (such as used in hybridization analysis such as Northern, Southern. dot, and the like), or microwells, sample tubes, gels, beads or fibers (or any solid support comprising bound nucleic acids). The detection of biomarker expression may also comprise using nucleic acid probes in solution.

[0071] Kits for practicing the methods of the invention are also contemplated herein. By "kit" is intended any manufacture (e.g., a package or a container) comprising the components necessary to detect differential expression of an OA biomarker in a feline. Said kits may comprise, for example, at least one reagent. e.g., an antibody, a nucleic acid probe, etc. for specifically detecting the expression of a biomarker of the present invention. As contemplated herein, the kits of the present invention may focus on the diagnostic use of a single type of component (for example, reagents such as antibodies or nucleic acid probes) or may comprise different types of components and the relative amounts of each may vary, such that the majority of the components may be of one type or another, or the reagents may be of equal amounts. A kit of the present invention may also comprise a microarray comprising one or more nucleic acids specific for the OA biomarkers of the present invention or subsets of said biomarkers. The kit may be promoted, distributed, or sold as a unit for performing the methods of the present invention. Additionally, the kits may contain a package insert describing the kit and methods for its use.

[0072] In a particular embodiment, kits for practicing the immunocytochemistry methods of the invention are provided. Such kits are compatible with both manual and automated immunocytochemistry techniques (e.g., cell staining). These kits comprise at least one antibody directed to a biomarker of interest, chemicals for the detection of antibody binding to the biomarker, and a counterstain. Any chemicals that detect antigen-antibody binding may be used in the practice of the invention. In some embodiments, the detection chemicals comprise a labeled polymer conjugated to a secondary antibody. For example, a secondary antibody that is conjugated to an enzyme that catalyzes the deposition of a chromogen at the antigen-antibody binding site may be provided. Such enzymes and techniques for using them in the detection of antibody binding are well known in the art.

[0073] In another embodiment, the kits of the invention additionally comprise at least two or more reagents, e.g., antibodies, for specifically detecting the expression of at least two or more distinct biomarkers. Each antibody may be provided in the kit as an individual reagent or, alternatively, as an antibody cocktail comprising all of the antibodies directed to the different biomarkers of interest. Furthermore, any or all of the kit reagents may be provided within containers that protect them from the external environment, such as in sealed containers.

[0074] Positive and/or negative controls may be included in the kits to validate the activity and correct usage of reagents employed in accordance with the invention. Controls may include samples, such as tissue sections, cells fixed on glass slides, etc., known to be either positive or negative for the presence of the biomarker of interest. The design and use of controls is standard and well within the routine capabilities of those of ordinary skill in the art.

[0075] In other embodiments, kits for identifying OA in a feline comprising detecting differential expression of a biomarker at the nucleic acid level are provided. Such kits comprise, for example, at least one nucleic acid probe that specifically binds to a biomarker nucleic acid or fragment thereof. In particular embodiments, the kits comprise at least two or more nucleic acid probes that hybridize with distinct biomarker nucleic acids and may additionally comprise a microarray comprising nucleic acid encoding the OA biomarkers.

[0076] It is contemplated that the invention described herein is not limited to the particular methodology, protocols, and reagents described as these may vary. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only, and is not intended to limit the scope of the present invention in any way.

[0077] Unless defined otherwise, all technical and scientific terms used herein have the same meanings as commonly understood by one of ordinary skill in the art to which this invention belongs. Although any methods and materials similar or equivalent to those described herein can be used in the practice or testing of the present invention, the preferred methods, devices and materials are now described. All publications mentioned herein are incorporated by reference for the purpose of describing and disclosing the materials and methodologies that are reported in the publication which might be used in connection with the invention.

[0078] In practicing the present invention, many conventional techniques in molecular biology may be used. These techniques are well known and are explained in, for example, Current Protocols in Molecular Biology, Volumes I. II, and III. **1997** (F. M. Ausubel ed.); Sambrook et al., 1989, Molecular Cloning: A Laboratory Manual, Second Edition, Cold Spring Harbor Laboratory Press. Cold Spring Harbor, N.Y.

[0079] As used herein and in the appended claims, the singular forms "a", "an" and "the" include plural reference unless the context clearly dictates otherwise. Thus, for example, reference to the "antibody" is a reference to one or more antibodies and equivalents thereof known to those skilled in the art, and so forth.

[0080] The following examples are offered by way of illustration and not by way of limitation.

EXAMPLES

Example 1

Gene Expression in Cats with Osteoarthritis Compared to Control Cats

[0081] Studies are conducted using non-arthritic cats and cats with osteoarthritis (OA) to determine the underlying gene expression differences between non-arthritic cats and cats with OA. In one study, a baseline comparison is performed between the two groups to determine the underlying gene expression differences between non-arthritic cats and cats with OA. In a second study, another group of non-arthritic cats and cats with OA are used, however, in addition to the baseline comparison between all normal animals and all OA animals, a diet is tested over time for the ability to dampen

the progression of the disease. Quantitative real-time PCR studies are also performed using the samples obtained from the second study.

[0082] With regard to the studies provided herein, cats with OA are graded according to a previously published method, i.e., all non-arthritic cats are "grade **0**" indicating that the joint appears to be normal, cats with OA have grades that are either 1 (small enthesophytes or small osteophytes present) or 2 (more prominent enthesophytes and osteophytes). Cats with severe OA (grade 3) are not included in this study.

[0083] Whole blood is obtained from the cats in the studies provided herein using PAXgene™ RNA tubes and total RNA is isolated from whole blood samples using PAXgene™ RNA isolation kit according to the methods detailed below.

[0084] PAXgene™ Blood RNA Isolation: PAXgene™ Blood RNA tubes and the PAXgene™ Blood RNA Kit (Qiagen) are used together to isolate and purify intracellular RNA from whole blood obtained from felines as provided below (see also PAXgene™ Blood RNA Kit Handbook, PreAnalytix, June 2005). Briefly, blood is collected using a Vacutainer® needle, directly into the PAXgene™ Blood RNA tube and then subjected to several rounds of centrifugation, wash and purification steps which ultimately result in high-quality RNA. The RNA then undergoes a quality control step and is then used in future quantitative real-time PCR and/or microarray analyses using a custom manufactured proprietary feline gene chip produced on the Affymetrix platform.

[0085] Assay Preparations: Incubate PAXgene™ tubes (containing blood) for at minimum of 2 hours at room temperature before beginning the assay. If the tubes are frozen, and are not allowed to incubate for 2 hours prior to freezing, they will need to sit at room temperature to thaw an additional 2 hours. Invert each PAXgene™ tube 8-10 times before the first centrifugation. If using Buffer BR4 (buffers are included with the PAXgene™ Blood RNA Kit) for the first time, add 4 volumes of 96-100% ethanol to the concentrated buffer to obtain a working solution. Preheat two heating blocks prior to beginning the assay—65° C. and 55° C. Prepare the DNase I stock solution (the RNase-Free DNase Set is included with the PAXgene™ Blood RNA Kit). Dissolve the solid DNase I enzyme in 550 μL of RNase-free water provided with the kit. Be sure not to lose any DNase I when removing the lid. Mix gently by inverting the tube. Do not vortex or centrifuge. Make a mixture of DNase I enzyme and Buffer RDD (kit component) (enough volume for the number of samples being processed per hatch). Each sample needs 704, of Buffer RDD and 104 of DNase I (i.e. 20 samples would require a cocktail of 1.4 mL Buffer RDD and 200 μl, DNase I). The cocktail should he stored at 2-8° C. until needed. The reconstituted enzyme is good for up to 6 weeks at 2-8° C.

[0086] Sample storage: PAXgene™ tubes (which contain blood) can be stored at room temperature for up to 3 days before processing. According to the product insert provided with the PAXgene™ Blood RNA tubes, the cellular RNA profile is stable under these conditions for up to 3 days. This, however, may vary between species. PAXgene™ tubes can also be stored at 4° C. for up to 5 days. If long term storage is required, PAXgene™ tubes can be stored at −20° C. or −70° C. for up to 6 months. Tubes should be frozen in a loose wire rack in an upright position. It is recommended to freeze first at −20° C. and then transfer to −70° C. if tubes will be stored at −70° C. Upon removing the tubes from the freezer they should be thawed at room temperature (temperature not to exceed 22° C.). Each tube is to be inverted 10 times before proceeding with the assay.

[0087] RNA Isolation from Whole Blood: Centrifuge the PAXgene™ Blood RNA tubes at 4000×g for 10 minutes. Remove the supernatant by decanting and discard. Blot excess supernatant remaining on rim of PAXgene™ tube. Add 4 mL of RNase-free water to the pellet and cap with a new Hemogard closure. Resuspend the pellet by vortexing and then centrifuge at 4000×g for 10 minutes. Remove the supernatant by decanting and discard. Blot excess supernatant remaining on rim of PAXgene™. Add 360 μL of Buffer BR1 (kit component) to the pellet and gently pipette until pellet is completely resuspended. Transfer the sample to a sterile 1.5 mL microcentifuge tube and add 300 μL Buffer BR2 (kit component) and 40 μL Proteinase K (do not mix Buffer BR2 and Proteinase K prior to adding to the sample). Mix each tube thoroughly by vortexing and place into a thermomixer preheated to 55° C. Incubate/shake the tubes for 10 minutes at 1400 rpm. Pipet the lysate into a Q1A shredder spin column placed into a 2 mL collection tube. Centrifuge at 14,000 rpm for 3 minutes. Transfer the supernatant of the flow-through fraction to a sterile 1.5 mL microcentrifuge tube. Add 350 μL of 96-100% ethanol and gently mix by pipetting. Add 700 μL of the sample to the PAXgene™ spin column placed in a 2 mL collection tube and centrifuge at 14,000 rpm for 1 minute. Transfer the PAXgene™ spin column into a new 2 mL collection tube and discard the flow-through and old collection tube. Add the remaining volume of the sample to the PAXgene™ spin column. Centrifuge at 14,000 rpm for 1 minute.

[0088] Discard the old collection tube and the flow-through from the centrifugation of the spin column described immediately above. Place the PAXgene™ spin column into a new 2 mL collection tube. Add 350 μL of Buffer BR3 (kit component) to the PAXgene™ spin column and centrifuge at 14,000 rpm for 1 minute. Discard the flow-through and collection tube. Place the column into a new 2 mL collection tube and add 80 μL of the DNase I/Buffer RDD cocktail (see "Assay Preparations") directly to the column membrane and incubate for 15 minutes at room temperature. Add another 350 μL Buffer BR3 to the PAXgene™ spin column. Centrifuge at 14,000 rpm for 1 minute. Transfer the PAXgene™ spin column to a new 2 mL collection tube and discard the old collection tube and flow-through.

[0089] Add 500 μL of Buffer BR4 (kit component) to the PAXgene™ spin column. Centrifuge at 14,000 rpm for 1 minute. Place the PAXgene™ spin column into a new 2 mL collection tube and discard the old collection tube and flow-through. Add another 500 μL Buffer BR4 to the PAXgene™ spin column. Centrifuge at 14,000 rpm for 3 minutes to dry the spin column membrane. Discard the collection tube and flow-through and place the columns in another 2 mL collection tube. Spin the samples again at 14,000 rpm for an additional minute to further dry the column membrane. Discard the flow-through and the collection tube. Transfer the PAXgene™ spin column to a 1.5 mL elution tube. Add 404 Buffer BR5 (kit component) directly to the PAXgene™ spin column membrane. Centrifuge at 14,000 rpm for 1 minute. Remove the PAXgene™ spin column and pipette the eluate in the 1.5 mL tube onto the same PAXgene™ spin column. Return the PAXgene™ spin column to the same 1.5 mL elution tube and centrifuge at 14,000 rpm for 1 minute. Incubate the final

eluate at 65° C. for 5 minutes and immediately chill on ice. Store final RNA sample at −80° C. for future use.

Example 2

Gene Chip Analyses

[0090] A proprietary, custom made feline gene chip (Affymetrix) is used to evaluate base line gene expression in cats with and without OA (10 normals, 10 arthritic animals). As provided above, gene chip analyses are performed using conventional methods and according to the manufacturer's instructions in order to obtain a baseline comparison between the two groups to determine the underlying gene expression differences between non-arthritic cats and cats with OA.

[0091] The raw gene chip data is normalized using the Robust Multiarray Average (RMA) normalization algorithm (Irizarry. et al., Biostatistics 2003 Vol 4, Page 249-264) and is then subjected to statistical analysis using Support Vector Machine (SVM) algorithm (Partek Genomic Suite, Version 6) to determine the gene expression differences that can differentiate between arthritic and non-arthritic animals. Genes identifying OA biomarkers are selected based on p value cut off and fold change (FC) according to the following: genes with p value <0.001 and displaying a fold change of either >2.0, >1.5 or >1.3; and genes with a p value <0.01 and displaying a fold change of either >2, >1.5 or >1.3. The lists of feline OA biomarkers thus identified are provided herein in FIGS. **1-6**.

[0092] The results from these studies indicate that gene expression can be used to differentiate between normal cats and cats with OA. The lists of differentially expressed genes include sequences that act as cell surface markers, receptors and other signaling molecules.

Example 3

Effect of Diet on Gene Expression in Feline Arthritis

[0093] In this study, quantitative real-time PCR assays are performed using RNA isolated from normal and arthritic cats. In addition to a baseline comparison between arthritic and normal animals, the effect of diet is also measured. Specifically, following standard animal nutrition testing procedures familiar to one of skill in the art, arthritic and normal cats are fed test diets comprising components reported to be of use to combat inflammatory disease, including polyunsaturated fatty acids such as omega-3 fatty acids, such as provided in WO 2007/002837 A2 ("j/d") and WO 2006/074089 A2 ("senior") and then changes in gene expression in the animals is analyzed using qRT-PCR. OA serum markers are also assayed using conventional methods (ELISA).

[0094] With regard to q RT-PCR, Taqman probe technology is used and all analyses are carried out using an Applied Biosystems 7500 real-time PCR machine. The data is analyzed using the sequence detection software package version 1.2.2. provided by the manufacturer.

[0095] A baseline comparison of normal and arthritic animals using qRT-PCR detect OA biomarker genes associated with proteases and cartilage degradation: Caspase 1, Caspase 3, MMP 2, MMP16. Inhibitor of MMP1. Inhibitor of MMP2, Inhibitor of MMP3, Cysteine protease. PUMP-1 and Progesterone-dependent protein and genes associated with inflammation: IFN-gamma; TGF-beta; MIP-1 alpha; IL-1 alpha; IL-1 beta; IL-2; IL-6 and IL-10. Data also indicate that IL-1 and TGF-beta are significantly different between the arthritic and nonarthritic animals (see FIGS. **8** and **9**). IL-1 is known to induce arthritic lesions in experimental animals. This result is corroborated by the gene chip analysis (data not shown).

[0096] Also, using conventional ELISA methods. blood levels of a peptide of type I collagen (NTx, see FIG. **10**) and Collagen II (CTX-II, see FIG. **11**) are measured in the animals and data indicate that cats fed a diet containing high levels of EPA and DHA show a marked reduction in circulating levels of these OA markers.

[0097] Clinical data obtained from nutritional studies involving the arthritic and non-arthritic animals described above indicate that dietary intervention can affect the expression of some OA biomarkers. Specifically, diets containing high levels of n-3 fatty acids DHA (0.3%) or DHA and EPA (0.3% and 0.46% respectively), can cause a decrease in the OA serum markers, collagen I (NTx) and a fragment of collagen II (CTX-II) but do not have an effect on levels of TGF-beta. With regard to TGF-beta, a lack of change which would be desired as this protein may play a protective role in arthritis. Furthermore, quantitative real-time PCR analysis reveals that the expression of IL-1 is also dramatically decreased in animals administered a diet containing DHA and EPA and this is desired as this protein is a known arthrogenic molecule. Thus, it is shown that feeding a diet rich in n-3 fatty acids EPA and DHA (based on TG oil) can cause a reduction in expression of IL-1. Nix and CTX-II.

1. A method for diagnosing OA in a feline comprising:
(a) determining the level of protein product of one or more biomarkers set out in FIGS. **1-7** in a body sample from said feline; and
(b) comparing the level of protein products in the body sample from said feline with levels in a control feline without OA, wherein differential expression of the protein products between the individual and the control is indicative of OA in the feline.

2. The method according to claim **1** wherein the level of protein product is determined using antibodies or fragments thereof.

3. The method according to claim **2**, wherein the antibodies are monoclonal antibodies.

4. The method of claim **1** wherein said body sample is a blood sample.

5. A method of diagnosing OA in a feline comprising:
(a) isolating nucleic acid from a body sample of a feline;
(b) determining the level of a nucleic acid encoding one or more biomarkers set out in FIGS. **1-7** in a body sample from said feline; and
(c) comparing the level of nucleic acid in the body sample from said feline with levels in a control feline without OA, wherein differential expression of the nucleic acid between the individual and the control is indicative of OA in the feline.

6. The method of claim **5**, wherein the level of nucleic acid is determined using methods comprising the use of quantitative RT-PCR.

7. The method according to claim **5**, wherein the level of nucleic acid is determined using methods comprising the use of microarrays.

8. The method according to claim **7**, wherein said microarray comprises a plurality of isolated polynucleotides selected from the group consisting of RNA, DNA, cDNA, PCR products, or ESTs corresponding to one or more of the biomarkers of FIGS. **1-7**.

9. The method according to claim **5**, wherein the body sample is a blood sample.

10. The method according to claim **5**, wherein the nucleic acid is RNA.

11. A composition comprising at least one or more isolated polynucleotides, wherein each isolated polynucleotide selectively hybridizes to a nucleic acid encoding a biomarker set out in FIGS. **1-7** and wherein the composition permits measurement of the level of expression of at least one or more biomarkers in a body sample from a feline.

12. The composition of claim **11** wherein the isolated polynucleotide is RNA.

13. A composition comprising at least one or more antibodies, wherein each antibody binds selectively to a protein product of a biomarker selected from the biomarkers set out in FIGS. **1-7** and wherein the composition permits the measurement of the level of expression of at least one or more biomarkers in a body sample from a feline.

14. The composition according to claim **13**, wherein the antibodies are monoclonal antibodies.

15. The method of claim **1** wherein the method is performed in an automated manner.

16. The method of claim **1** wherein the method is performed in conjunction with the use of conventional methods to diagnose osteoarthritis in a feline.

17. The method of claim **1** wherein the method is performed as a primary means to diagnose osteoarthritis in a feline.

18. A kit for diagnosing OA in a feline, said kit comprising:

(a) a microarray comprising a plurality of isolated polynucleotides selected from the group consisting of RNA, DNA, cDNA, PCR products, or ESTs corresponding to one or more of the biomarkers of FIGS. **1-7**; and/or

(b) a composition comprising at least one or more antibodies, wherein each antibody binds selectively to a protein product of a biomarker set out in FIGS. **1-7**

wherein components (a) or (b) may comprise a majority of the components of said kit.

19. A method for identifying a component to be tested for an ability to treat or ameliorate osteoarthritis in a feline comprising:

(a) contacting a cell capable of expressing an RNA or protein product of one or more OA biomarkers disclosed in FIGS. **1-7** with a test component;

(b) determining the amount of said RNA and/or product produced in the cells contacted with the test component; and

(c) comparing the amount of said RNA and/or protein product in the cells contacted with the test component to the amount of the same said RNA or protein product present in a corresponding control cell that has not been contacted with the test component; wherein if amount of the RNA or protein product is altered relative to the amount in the control, the component is identified as one to be tested for an ability to treat or ameliorate osteoarthritis in a feline.

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专利名称(译)	用于诊断猫科动物骨关节炎的方法和组合物		
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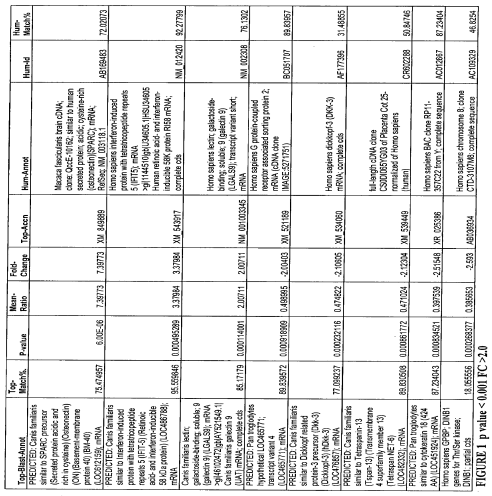
摘要(译)

公开了用于诊断猫科动物骨关节炎的方法，组合物和试剂盒。本发明的方法包括检测体样品中至少一种生物标志物的差异表达。优选血液样品，其中生物标志物在骨关节炎中差异表达。



Top-Blast-Annot	Top-Match%	P-value	Mean-Ratio	Fold-Change	Top-Accn	Hum-Annot	Hum-Id	Hum-Match%
PREDICTED: Canis familiaris similar to SPARC precursor (Secreted protein acidic and rich in cysteine)(Osteonectin) (mRNA-binding protein) (Basement membrane protein 40) (Basigin), mRNA (LOC621219), mRNA	75.47487	6.00E-06	7.39773	7.39773	XM_849889	Macaca fascicularis brain cDNA, clone: QccE-19192, similar to human secreted protein, acidic, cysteine-rich (osteonectin)(SPARC), mRNA. [Source:RefSeq mRNA;Acc:NM_003118]	AB164483	72.00373
PREDICTED: Canis familiaris similar to interferon-induced protein with tetratricopeptide repeats 5 (IFIT5) (Retinoic acid and interferon-inducible 58 kDa protein) (LOC486788), mRNA	85.556846	0.000495299	3.37984	3.37984	XM_545917	Homo sapiens interferon-induced protein with tetratricopeptide repeats 5 (IFIT5), mRNA (gene alias: CIG49, DKFZp564B1164, fetal-liver/adrenal-gland interferon-inducible 58 kDa protein, IFI58, protein RIG8) mRNA, complete cds.	NM_012420	92.27709
Canis familiaris lectin, galactoside-binding, soluble, 9 (galectin 9) (LGALS9), mRNA, gi|49157247|ggb|YS2154.1| Canis familiaris galectin-9 (LGALS9) mRNA, complete cds.	85.17179	0.000114001	2.00711	2.00711	NM_001003245	Homo sapiens lectin, galactoside-binding, soluble, 9 (galectin 9) (LGALS9), transcript variant short, mRNA.	NM_002308	79.1302
PREDICTED: Pan troglodytes hypothetical LOC409377, transcript variant 1, mRNA (LOC409377), mRNA	89.835872	0.000516899	0.468965	-2.01453	XM_521189	Homo sapiens G protein-coupled receptor associated sorting protein 2, mRNA (cDNA clone IMAGE:4277751)	BC051707	89.83957
PREDICTED: Canis familiaris similar to Dickkopf related protein-3 precursor (DKK-3) (Dickkopf-3 (Wnt-3)), mRNA (LOC518807), mRNA	77.092037	0.000223116	0.474822	-2.10605	XM_534050	Homo sapiens dickkopf-3 (DKK-3), mRNA, complete cds.	AF177398	31.48955
PREDICTED: Canis familiaris similar to Transgerin-13 precursor (Transgerin-like protein 4 superfamily member 13) (Tetraspan NET-6) (LOC423233), mRNA	89.850569	0.000861772	0.471024	-2.12304	XM_538449	full-length cDNA clone CS0DB002YG03 (Placenta Cot 25-normalized of Homo sapiens (human)	CR932238	59.84746
PREDICTED: Pan troglodytes similar to Transgerin-13 precursor (Tetraspan NET-6 AA) (LOC415924), mRNA	87.234043	0.000854511	0.397539	-2.51548	XR_025398	Homo sapiens BAC clone RP11-557O22 from 1, complete sequence	AC012867	87.23404
Homo sapiens GPSP_DNB1 gene for TheGer kinase, DNB1 gene exon 2a	18.965556	0.000268377	0.389953	-2.5193	AB092854	Homo sapiens chromosome 8, clone CTD-3107N6, complete sequence	AC105329	46.6254

FIGURE 1 p value < 0.001 FC >2.0