

Supplementary Materials for

Role of PPAR Pathway in Atrial Fibrillation Associated with Heart Valvular Disease: Transcriptomics and Proteomics in the Human Atrial Tissue

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Materials and Methods

Transcriptomics analysis

The transcriptomics analysis was performed in the atrial tissue. Five tissue samples from 3 AF patients and 2 SR patients were divided into left atrial tissue group (LA, n=3) and right atrial tissue group (RA, n=3) in the AF patients and right atrial tissue in SR patients (n=2). Tissues from LA and RA in the AF group were obtained from the same patient. Total RNA was extracted from the tissue using TRIzol reagent (Invitrogen, Burlington, ON, Canada) and digested with DNase I (Takara, Dalian, China) according to the manufacturer's protocol. Next, Oligo (dT) magnetic beads were used to isolate mRNA from the total RNA. By mixing with fragmentation buffer, the mRNA was then broken into short fragments. The cDNA was synthesized using the mRNA fragments as templates. The short fragments were purified and resolved with EB buffer for end repair and single nucleotide A (adenine) addition, and then connected with adapters. Suitable fragments were selected for PCR amplification as templates. During the quality control steps, an Agilent 2100 Bioanalyzer (Agilent Technologies, Redwood City, CA, USA) and ABI StepOnePlus Real-Time PCR System (Life Technologies, Grand Island, NY, USA) were used for quantification and qualification of the sample library. Each cDNA library was sequenced in a single lane of the Illumina HiSeq™ 2000 system using paired end protocols according to the manufacturer's instructions at BGI.

Proteomics analysis

A discovery-validation workflow was used in the proteomics analysis. Isobaric tags for relative and absolute quantitation (iTRAQ) technology was used for the proteomics study. Because there are 8 Isobaric tags (m/z113,114,115,116,117,118, 119 and 121), the plasma samples from 24 patients were divided into 6 groups (3 AF group and 3 SR group), each of these groups contained the plasma from 4 patients. In addition, plasma samples from 12 AF or 12 SR patients were used

as control groups, respectively. Thus, the 8 Isobaric tags were concomitantly labeled in the plasma samples for the iTRAQ study.

In the iTRAQ study for atrial tissue, the samples were allocated into groups as described in the transcriptomics study.

In the validation phase, identified differential proteins were validated in a larger study population using enzyme-linked immunosorbent assays (ELISA) in plasma samples.

Protein digestion and iTRAQ labeling

Protein (100 ug) from each sample was precipitated by cold acetone at -20°C for 1 hour and then centrifuged at 12000rpm for 15 minutes, after which the deposit was collected and dissolved with 50 ul dissolution buffer. Proteins in the solution were reduced (4ul reducing reagent, 60°C for 1 hour), alkylated (2ul cysteine-blocking reagents, room temperature for 10 minutes), digested (50ul sequencing-grade trypsin ($50\text{ng}/\mu\text{L}$), 37°C for 12 hours) and centrifuged at 12000rpm for 20 minutes. Following digestion with trypsin, iTRAQ reagent (AB SCIEX, Framingham, MA, USA) was added and each sample was labeled with a unique iTRAQ tag (m/z113,114,115,116,117,118,119 and 121).

2D-LC-MS/MS analysis

The peptides were dried in a vacuum freeze dryer and re-suspended in 100ul of buffer A. Reversed-phase liquid chromatography (RPLC) was used to fractionate sample on the Agilent 1200 HPLC system (Agilent) equipped with HPLC column (Narrow-Bore $2.1*150\text{ mm } 5\mu\text{m}$, Agilent). A total of 10 segments were collected at a rate of $0.3\text{ml}/\text{min}$ using a nonlinear binary gradient starting with buffer A and transitioning to buffer B. The fractions were dried in a vacuum freeze dryer and re-dissolved in nano-RPLC buffer A. Each segment was loaded on a Eksigent nanoLC-Ultra™ 2D System (AB SCIEX) mounted with a C18 nanoLC trap column

(100 μm \times 3 cm, C18, 3 μm , 150 \AA) and separated over a 70 min acetonitrile gradient from 5 to 35% in 0.1% formic acid combined with a Triple TOF 5600 System (AB SCIEX, USA) fitted with a Nanospray III source (AB SCIEX, USA). Data were acquired using an ion spray voltage of 2.5 kV, curtain gas of 30 PSI, nebulizer gas of 5 PSI, and an interface heater temperature of 150 $^{\circ}\text{C}$.

iTRAQ data analysis and bioinformatics analysis

After data pre-processing, standardization, and quality control, the original data were screened for reliable peptides and proteins. Identification of peptides from tandem mass spectrometry (MS) was achieved using the Protein Pilot Software v.5.0 (AB SCIEX, USA) against Uniprot_Homo Sapiens Database to match the theory data in order to obtain result of protein identification. The criteria for differential proteins were established as: 1) Unique peptide ≥ 1 , apart from invalid values and anti-library data; 2) Fold change > 1.2 or < 0.83 ; and 3) P value < 0.05 (T-test for repeated data for over three times). Proteins fulfilling these criteria were considered to have significant difference in expression between the two groups.

A list of differential proteins identified was implemented on the on-line software DAVID Bioinformatics Resources 6.8 (NIH) for Gene Ontology (including biological process, molecular function and cellular component) function and enrichment analysis. Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway database and STRING database were used to perform pathway analysis and protein-protein interaction analysis.

Data processing and bioinformatics analysis

ChromaTOF software and Fiehn database were used to process the raw data and provide qualitative information about the metabolites. Data were normalized by total peak area of each sample using Excel 2007 and imported into SIMCA-P software (version 14.0, Umetrics, Umeå, Sweden) for multivariate statistical analysis. Principal component analysis (PCA) was used to visualize the general distribution of samples and the stability of the whole analysis process.

Partial least-squares discriminant analysis (PLS-DA) and orthogonal partial least-squares discriminant analysis (OPLS-DA) were used to distinguish the differences of general metabolic profiling between different patient groups. To avoid model overfitting, a default of seven rounds of cross-validation in SIMCA-P software was applied. Moreover, OPLS-DA models were validated by a permutation analysis with 200 times. Differential metabolites were selected according to variable importance in projection (VIP) values >1 in OPLS-DA model as well as P-values <0.05 in Student's test. KEGG pathway database was used to generate significant pathways in metabolomics dataset.

Creation of pathway maps

All the omics data including transcriptomics, proteomics, and metabolomics data were used to compare proteins/enzymes with metabolic pathways. Quantitative changes of individual metabolites and proteins as compared with control samples were calculated and graphed by using the KEGG mapping tools. In particular, by combining proteomics with metabolomics data, we were able to identify the common pathways involved in atrial fibrillation.

Figure. S1. The differential expression in PPAR pathway in atrial tissues: The overview of PPAR pathway

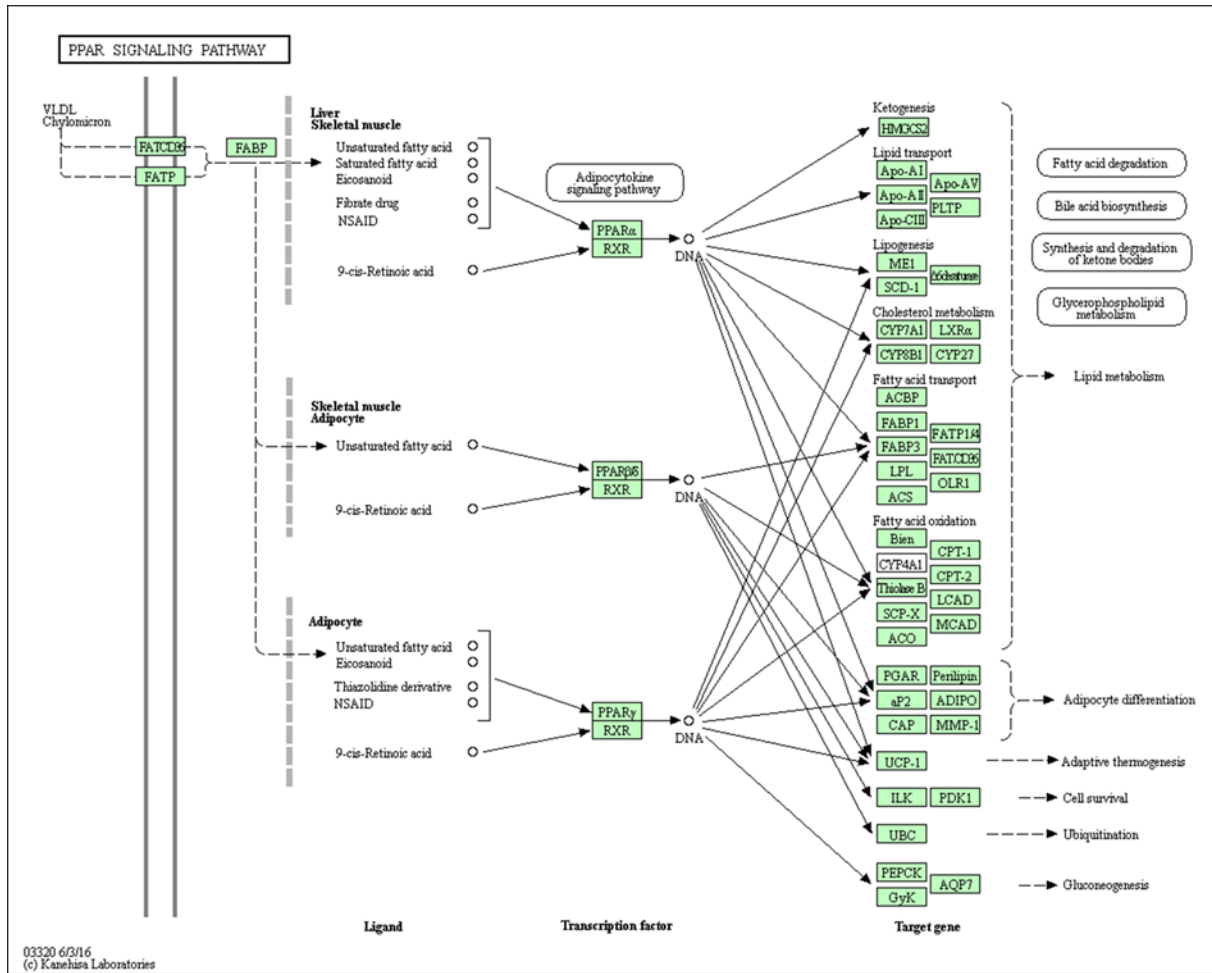


Table S1. Patients Characteristics

Characteristic	AF(n=36)	SR(n=26)
Gender (M:F)	20:16	15:11
Age (year)	59.5±8.2	51.4±13.3
BMI (kg/m ²)	24.0±4.2	23.5±2.6
Hypertension, n (%)	4(11.1)	2(7.7)
Hyperlipemia, n (%)	3(8.3)	1(3.8)
diabetes, n (%)	2(5.6)	1(3.8)
ACE inhibitors, n (%)	2(5.6)	1(3.8)
AT1-blockers, n (%)	0(0)	1(3.8)
Nitrates, n (%)	5(13.9)	2(7.7)
Lipid-lowering drugs, n (%)	3(8.3)	1(3.8)
Ca ²⁺ -antagonists, n (%)	2(5.6)	1(3.8)
LV-Dd, mm	55.5±7.2	54.3±8.5
LA-Ds _(A-P) , mm	53.9±8.0	49.6±6.9
RV-Dd _(L-R) , mm	36.4±3.2	33.25±3.5
RA-Ds _(L-R) , mm	40.4±4.3	36.6±3.1
LVEF	58.4±4.5	62.3±4.3

All variables displayed as mean±SEM;

AF=atrial fibrillation;

SR= sinus rhythm;

BMI= body mass index;

LV-Dd=left ventricular-diastolic diameter;

LA-Ds(A-P)=left atrium-systolic diameter (anterior-posterior);

RV-Dd(L-R)=right ventricular-diastolic diameter (left-right);

RA-Ds(L-R)=right atrium-systolic diameter (left-right);

LVEF= left ventricular ejection fraction;

Table S2. Differential genes and proteins identified in tissues.

A. Differential genes identified in tissues.

SRRA-VS-AFRA		SRRA-VS-AFLA		AFRA-VS-AFLA	
Symbol	log2Ratio	Symbol	log2Ratio	Symbol	log2Ratio
VGLL2	2.756	CFC1	-8.459	DGAT2	1.477
CFC1	-4.344	KRT19	-3.325	PITX2	5.946
KRT19	-3.036	CNTFR	-1.534	GPD1	1.778
CNTFR	-1.522	PLP1	-1.264	IGJ	1.265
CPA4	-2.268	CPA4	-3.013	FOSB	-2.185
PPP1R1A	-1.382	PITX2	5.394	CCL19	1.172
XIST	6.689	GNAO1	-1.253	BMP10	-9.310
LOC100216479	-1.932	XIST	6.455	TUSC5	2.044
ABAT	1.092	DMKN	-2.640	RGS1	-1.701
FNDC5	-1.025	TPSB2	1.539	CLDN5	1.473
PTGDS	-1.200	LOC100216479	-2.830	PRSS35	-2.217
EGR2	2.328	LFNG	1.355	FCGR3A	-1.066
CXCR4	1.167	NDUFA4L2	1.045	ACTG2	1.519
COMP	2.941	COMP	3.230	NPR3	-1.615
UPK1B	-2.086	CGNL1	-1.737	IGLL5	1.680
IGJ	1.444	ASPG	-1.275	NR4A2	-1.565
DNER	-2.951	CD36	1.147	SFRP1	1.335
UPK3B	-4.164	EFHD1	1.397	THBS4	1.822
CD37	1.401	GPD1	1.079	PPP1R14A	1.337
CCL2	1.259	TNFRSF12A	1.908	SMYD2	-1.574
FOSB	3.944	UPK1B	-2.168	CCL21	2.883
PLA2G2A	-1.475	IGJ	2.709	CIDEA	1.801
CCL19	1.763	DNER	-2.515	CIDEA	2.037
CFB	-1.457	GPR126	-1.791	APOD	1.457
CCL4L1	2.058	RGS6	-2.398	ADIPOQ-AS1	1.851
TSIX	4.082	DIRAS3	-1.821	MYOZ1	-2.366
RGS1	3.206	TGM2	-1.065	TAGLN	1.003
RARRES1	-1.372	UPK3B	-3.367	C2orf40	1.178
G0S2	-1.113	CD37	1.343	SLN	-1.897
SULF1	-1.129	CCL2	1.386	DARC	3.484
SMOC1	-1.726	SGK110	-1.349	ART3	-1.056
EFNB3	-2.922	PLA2G2A	-2.037	GPIHBP1	1.660
TNC	1.870	TMEM100	-1.542	SMAD7	-1.044
CD52	2.061	CPNE5	-1.033	TF	1.569
LCP1	1.189	INHA	-2.576	SPP1	-1.316
FHL2	1.479	CCL19	2.936	MYBPHL	1.243
LSP1	1.104	PTN	1.220	CXCL14	2.313
GADD45G	-1.235	CFB	-1.724	CSRP2	1.216
CD79A	3.185	BMP10	-8.817	ADAMTSL2	-1.176
HBG2	-3.787	HCN4	-3.295	ADM	-1.748
PKHD1L1	-1.420	EPHB6	-1.721	MAPK4	-1.092

SOCS3	2.153	TSIX	3.890	MT3	3.051
IGLL5	2.379	RARRES1	-2.099	COLEC11	-1.458
SELENBP1	-1.494	SMOC1	-2.486	PLIN1	1.791
MPZ	-1.540	EFNB3	-2.448	RBP4	1.512
TREM2	1.730	ACTG2	2.189	IGFBP3	-1.091
SPRR2F	-5.383	CD52	2.259	STEAP4	1.177
KLK11	-2.508	LCP1	1.191	ELK2AP	1.421
SOSTDC1	-3.126	CSRP3	1.246	APOA1	-1.518
C19orf33	-2.848	LSP1	1.440	AZGP1	2.027
STXBP6	-1.850	GNLY	2.676	SCD	1.796
RSP01	-2.961	TCEAL2	-1.607	TENM2	-1.277
ANXA8L2	-2.938	COL6A6	-1.804	TCF15	2.648
CCL3	2.098	A2M	1.112	MYOT	1.461
TGM1	-2.329	HBG2	-4.486	C1orf115	1.359
LMAN1L	-2.533	GSTM5	-1.705	MARCO	-2.572
CCDC163P	-2.547	PKHD1L1	-3.075	CXorf36	1.376
EGR1	1.618	NPR3	-2.027	SMAD6	-1.116
SBSPON	-2.134	IGLL5	4.059	ADIPOQ	1.877
NR4A2	3.541	CACNA2D2	-2.153	FABP4	2.127
ADAMTS1	1.227	SELENBP1	-1.063	MYL2	2.165
PHGDH	-1.774	IRX3	-2.094	LIPE	1.754
SLC6A6	1.288	SPRR2F	-5.447	NTM	-1.706
IGFBP2	2.024	KLK11	-3.511	DNASE1L3	-1.484
C1orf105	-3.340	LTB	1.878	DISC2	-3.050
CRLF1	1.967	SOSTDC1	-2.769	THRSP	1.829
SMYD2	1.097	PENK	3.509	HAMP	-7.334
TM4SF1	-1.179	LRRC49	-1.549	SERF1A	9.442
KRT7	-1.935	CXCL13	8.211	FABP5	1.037
MS4A1	3.678	CPA3	2.441	BTNL9	1.411
CALB2	-1.985	SULT1A3	8.182	CLDN18	4.909
SLC2A3	1.529	C19orf33	-3.284	CHGB	1.024
SUSD4	-1.455	STXBP6	-1.508	FOS	-1.013
PEBP4	-1.034	ANXA8L2	-3.404	ACTA2	1.085
SPOCK2	-1.311	TGM1	-2.444	C1QTNF9	2.610
GAS1	-1.169	LMAN1L	-1.311		
CCL18	1.889	CCDC163P	-2.464		
MYRF	-2.480	SBSPON	-2.516		
RPSAP58	4.477	SFRP1	1.369		
MXRA5	1.612	CD48	1.437		
GALNT16	-1.287	ADAMTS1	1.454		
PDZK1IP1	-3.160	PHGDH	-1.589		
UNC5B-AS1	1.303	HLA-DOA	1.568		
SYT13	-3.518	IGFBP2	2.392		
MSR1	1.436	RPL3L	1.455		
SEMA3B	-1.148	BMX	-1.733		
ATP1B4	3.023	CRLF1	2.216		
PHLDA1	1.531	THBS4	2.501		
MT1L	-1.199	PPP1R14A	1.323		

FCGR2A	1.126	MZB1	6.231
ANXA8	-3.233	MEOX1	1.650
SLC27A6	-1.115	MS4A1	3.322
RARRES2	-1.372	CALB2	-1.503
KRT18	-1.741	CCL21	3.328
HBB	-1.596	THBS2	1.118
CCL4	1.698	CIDEA	1.279
SIK1	2.147	LPL	1.584
CCL3L1	8.458	SUSD4	-2.701
COLQ	2.023	APOD	1.220
CDKN1A	1.458	GAS1	-1.498
BNC1	-2.668	ADIPOQ-AS1	1.594
ITLN1	-3.026	MYOZ1	-2.566
PDGFRL	-1.760	PDPN	-1.651
TNNT1	1.673	MYRF	-2.712
SPP1	3.150	S100A8	1.250
MYBPHL	-1.935	RPSAP58	4.598
MUSTN1	-1.087	GEM	1.436
HBA2	-1.939	GPR22	-1.282
BCYRN1	1.206	PDZK1IP1	-3.313
SFRP5	-2.496	UNC5B-AS1	1.729
MEDAG	-1.437	MFAP5	1.176
JUNB	1.963	SEMA3B	-1.297
GSTM1	-2.721	SLN	-2.811
RBP4	-1.689	ATP1B4	2.640
MYH6	-1.091	PHLDA1	1.429
MAL2	-2.374	DARC	4.241
TNNT3	-1.115	ART3	-2.013
HP	-1.920	ANXA8	-2.901
AOX1	-1.527	TMEM132C	-1.842
PRG4	-2.524	RARRES2	-1.211
TPSAB1	1.939	KRT18	-1.296
SMTNL2	-2.224	HBB	-2.126
SLC7A11	-2.758	COLQ	2.028
CARNS1	-1.364	CDKN1A	1.127
RBP1	-1.254	SMAD7	-1.062
PTPRF	-1.404	BNC1	-3.009
ARL4D	-1.293	ITLN1	-3.667
LBH	1.020	GRIN2C	-1.696
C3	-1.087	TNNT1	1.741
CD83	1.719	SPP1	1.834
NR4A1	1.939	MUSTN1	-1.705
ELK2AP	2.574	HBA2	-2.382
RNA5-8S5	1.699	ADM	-2.064
MT1X	-2.049	BCYRN1	2.146
CPXM1	-1.639	SFRP5	-2.962
UBD	3.926	SLC5A12	-3.500
DHCR24	-1.469	MEDAG	-1.835

APOA1	1.670	PTGS1	-1.777
CLDN15	-2.178	JUNB	1.151
MSLN	-2.965	GSTM1	-2.273
MARCO	-1.514	COLEC11	-2.339
RHBDL3	-2.760	FAM216B	-1.222
SYT4	-2.315	LEPR	-1.174
HBA1	-1.564	MAL2	-2.017
SNORD3A	8.148	HP	-2.608
ANXA8L1	-2.533	AOX1	-1.693
BCHE	-2.013	PRG4	-2.949
GOLGA4	1.197	ITGBL1	1.412
LRRN4	-2.707	SOD3	1.075
ALOX15	-2.776	TPSAB1	2.729
ITLN2	-3.560	SMTNL2	-3.080
C4B_2	-1.424	SLC7A11	-2.542
RCAN1	1.240	DDR1	-1.203
CYP4F30P	-2.550	COL1A1	1.182
OTOGL	-1.666	CARNS1	-2.110
CXCL9	2.836	RBP1	-1.200
MT1G	3.694	ARL4D	-1.808
ASPEN	1.289	EMILIN3	-1.419
DHRS9	1.717	CGN	-2.883
DNLZ	1.161	STEAP4	1.268
LYVE1	-1.414	NR4A1	1.285
ZFP36	1.242	ELK2AP	3.996
CFI	-1.100	RNA5-8S5	1.309
HLA-DPA1	1.099	MT1X	-2.384
SHD	-1.965	GPC3	-1.169
CPLX3	-3.102	UBD	3.755
PLLP	-1.941	FAM84A	-4.177
CSRNP1	1.575	AZGP1	1.747
SLPI	-2.226	SCD	1.528
CHGB	2.830	TENM2	-1.286
FOS	1.474	CLDN15	-2.316
ANKRD23	-2.120	MSLN	-3.515
NPPB	4.479	ZDHHC11	-1.247
RPS26	-1.068	MYOT	2.128
		MARCO	-4.086
		CHODL	-3.399
		NOTCH3	1.349
		SYT4	-3.022
		CXorf36	1.448
		HBA1	-2.110
		ADIPOQ	1.686
		SNORD3A	8.486
		ANXA8L1	-3.281
		FABP4	1.694
		BCHE	-1.878

LRRN4	-3.368
MYL2	2.471
NTM	-2.336
SLC4A4	-1.581
ALOX15	-3.481
ITLN2	-3.643
DNASE1L3	-1.504
DISC2	-3.315
VCAN	1.250
RCAN1	1.256
CYP4F30P	-9.194
OTOGL	-1.925
CXCL9	2.357
ASPN	1.185
DHRS9	1.811
S100A9	1.122
SFRP4	1.167
HPR	-1.271
RGS5	1.046
LYVE1	-1.808
ALDH1A2	-1.474
THY1	1.697
HAMP	-7.473
CFI	-1.390
SERF1A	9.442
COL9A1	-2.684
SLC39A8	-1.070
SHD	-1.651
CPLX3	-1.461
PLLP	-2.378
SLPI	-3.065
PRR15	-2.596
CLDN18	4.194
CHGB	3.854
LTBP2	1.334
NPPB	4.553
CYR61	1.586
GPM6A	-2.597

B. Differential proteins identified in tissues.

SRRA-VS-AFRA		SRRA-VS-AFLA		AFRA-VS-AFLA	
Accession	Fold Change	Accession	Fold Change	Accession	Fold Change
tr I1VZV6 I1VZV6_HUMAN	0.195	sp O95393 BMP10_HUMAN	0.18	sp O95393 BMP10_HUMAN	0.116
tr D3GKD8 D3GKD8_HUMAN	0.243	tr D3GKD8 D3GKD8_HUMAN	0.205	sp Q9NP98 MYOZ1_HUMAN	0.294
sp P02042 HBD_HUMAN	0.245	sp P02042 HBD_HUMAN	0.316	tr A0A0A0MSG2 A0A0A0MSG2_HUMAN	0.465
sp P05787 K2C8_HUMAN	0.258	sp P08729 K2C7_HUMAN	0.336	tr B1ALD9 B1ALD9_HUMAN	0.535
sp P08729 K2C7_HUMAN	0.267	tr Q5IWS5 Q5IWS5_HUMAN	0.355	sp Q8TAE6 PP14C_HUMAN	0.555
tr Q5IWS5 Q5IWS5_HUMAN	0.274	sp Q9NP98 MYOZ1_HUMAN	0.37	sp A6NMZ7 CO6A6_HUMAN	0.566
tr E5RHP7 E5RHP7_HUMAN	0.306	sp P05787 K2C8_HUMAN	0.382	tr H3BRN4 H3BRN4_HUMAN	0.579
sp P00918 CAH2_HUMAN	0.313	tr A0A024R2V1 A0A024R2V1_HUMAN	0.402	tr A4UCS6 A4UCS6_HUMAN	0.609
tr B2RA03 B2RA03_HUMAN	0.33	tr B3VL28 B3VL28_HUMAN	0.403	tr Q5T9B9 Q5T9B9_HUMAN	0.677
sp P08727 K1C19_HUMAN	0.331	sp P08727 K1C19_HUMAN	0.411	sp P15848 ARSB_HUMAN	0.691
sp A2RUH7 MBPHL_HUMAN	0.338	sp P00918 CAH2_HUMAN	0.454	tr V9GYG9 V9GYG9_HUMAN	0.704
tr A0A024R2V1 A0A024R2V1_HUMAN	0.427	tr B4DMR6 B4DMR6_HUMAN	0.458	tr B4DX19 B4DX19_HUMAN	0.706
tr B4DMR6 B4DMR6_HUMAN	0.43	tr B2R6F7 B2R6F7_HUMAN	0.478	sp Q9BW30 TPPP3_HUMAN	0.706
tr B2R6F7 B2R6F7_HUMAN	0.444	sp Q9Y623 MYH4_HUMAN	0.492	tr A0A0A0MTR1 A0A0A0MTR1_HUMAN	0.708
tr B3KUR3 B3KUR3_HUMAN	0.469	tr B3KUR3 B3KUR3_HUMAN	0.545	tr B4DGU4 B4DGU4_HUMAN	0.709
sp P04040 CATA_HUMAN	0.538	sp A2RUH7 MBPHL_HUMAN	0.552	tr B4DL07 B4DL07_HUMAN	0.71
sp P16157 ANK1_HUMAN	0.572	tr A0A0A0MSG2 A0A0A0MSG2_HUMAN	0.581	sp P09936 UCHL1_HUMAN	0.733
tr B2R8P6 B2R8P6_HUMAN	0.576	sp Q9UK22 FBX2_HUMAN	0.591	tr C9JWC3 C9JWC3_HUMAN	0.736
tr H3BN14 H3BN14_HUMAN	0.592	tr B4DUL3 B4DUL3_HUMAN	0.608	tr A0A075B6R9 A0A075B6R9_HUMAN	0.738
tr A0A087WZE4 A0A087WZE4_HUMAN	0.615	tr B7Z4A1 B7Z4A1_HUMAN	0.612	tr A0A087X1J7 A0A087X1J7_HUMAN	0.738
tr Q8N7G1 Q8N7G1_HUMAN	0.618	tr K7ERI9 K7ERI9_HUMAN	0.626	sp P19022 CADH2_HUMAN	0.745
sp Q5T481 RBM20_HUMAN	0.622	sp P16157 ANK1_HUMAN	0.643	sp Q5BKX8 MURC_HUMAN	0.756

tr A0A0A0MRE3 A0A0A0MRE3_HUMAN	0.622	tr B4E1B2 B4E1B2_HUMAN	0.651	tr K7ER74 K7ER74_HUMAN	0.757
tr B7Z4V9 B7Z4V9_HUMAN	0.623	sp Q9Y584 TIM22_HUMAN	0.66	sp O75147 OBSL1_HUMAN	0.759
tr Q0EFC6 Q0EFC6_HUMAN	0.629	sp P09471 GNAO_HUMAN	0.661	sp P01023 A2MG_HUMAN	0.761
sp Q4G0N4 NAKD2_HUMAN	0.634	tr B4DX19 B4DX19_HUMAN	0.662	tr G3V1Y8 G3V1Y8_HUMAN	0.762
tr A0A087WT59 A0A087WT59_HUMAN	0.636	tr A0A024R2V4 A0A024R2V4_HUMAN	0.663	tr S6AWE6 S6AWE6_HUMAN	0.768
sp Q2TAY7 SMU1_HUMAN	0.638	tr H6VRF8 H6VRF8_HUMAN	0.664	sp P02792 FRIL_HUMAN	0.772
sp P30043 BLVRB_HUMAN	0.649	sp P04040 CATA_HUMAN	0.668	sp P54652 HSP72_HUMAN	0.774
tr A0A087WUF6 A0A087WUF6_HUMAN	0.65	sp Q86TP1 PRUNE_HUMAN	0.669	tr H0UI60 H0UI60_HUMAN	0.781
tr I3L2B0 I3L2B0_HUMAN	0.663	tr G3V1Y8 G3V1Y8_HUMAN	0.678	sp A4UGR9 XIRP2_HUMAN	0.783
tr A0A024R825 A0A024R825_HUMAN	0.664	tr A0A024R4D5 A0A024R4D5_HUMAN	0.683	sp Q9UJS0 CMC2_HUMAN	0.783
tr B2RB32 B2RB32_HUMAN	0.664	tr B2R8P6 B2R8P6_HUMAN	0.684	sp P02144 MYG_HUMAN	0.784
sp O00483 NDUA4_HUMAN	0.665	sp P68133 ACTS_HUMAN	0.687	sp Q9UJY1 HSPB8_HUMAN	0.787
sp P12429 ANXA3_HUMAN	0.679	tr A0A087WTK8 A0A087WTK8_HUMAN	0.689	tr A8K141 A8K141_HUMAN	0.791
tr H0YAC1 H0YAC1_HUMAN	0.681	tr B4DL07 B4DL07_HUMAN	0.696	tr A0A024RC87 A0A024RC87_HUMAN	0.791
sp Q13228 SBP1_HUMAN	0.683	tr A0A087X1J7 A0A087X1J7_HUMAN	0.696	tr Q53FN1 Q53FN1_HUMAN	0.791
sp Q5VTU8 AT5EL_HUMAN	0.685	tr Q8N7G1 Q8N7G1_HUMAN	0.697	sp Q99959 PKP2_HUMAN	0.793
sp P62760 VISL1_HUMAN	0.686	sp P30043 BLVRB_HUMAN	0.697	tr A0A087WTE4 A0A087WTE4_HUMAN	0.796
sp P26678 PPLA_HUMAN	0.696	tr B4DDB3 B4DDB3_HUMAN	0.697	tr A0A0A0MS87 A0A0A0MS87_HUMAN	0.798
tr K7ERI9 K7ERI9_HUMAN	0.704	tr A0A024R9B9 A0A024R9B9_HUMAN	0.699	tr Q5UGI6 Q5UGI6_HUMAN	0.801
tr H0YL90 H0YL90_HUMAN	0.708	sp Q07507 DERM_HUMAN	0.701	tr Q53GU8 Q53GU8_HUMAN	0.803
sp P15090 FABP4_HUMAN	0.709	tr B2RB32 B2RB32_HUMAN	0.704	tr Q9HCC1 Q9HCC1_HUMAN	0.805
sp P09455 RET1_HUMAN	0.71	sp Q6UWY5 OLFL1_HUMAN	0.709	tr A0A024R884 A0A024R884_HUMAN	0.805
sp Q9NY47 CA2D2_HUMAN	0.714	sp Q9NVI7 ATD3A_HUMAN	0.711	sp P01619 KV301_HUMAN	0.807
tr B4DVE1 B4DVE1_HUMAN	0.714	sp Q9UBG0 MRC2_HUMAN	0.712	tr E9PGC8 E9PGC8_HUMAN	0.809
tr G3V325 G3V325_HUMAN	0.715	sp Q5BKX8 MURC_HUMAN	0.712	sp Q9Y676 RT18B_HUMAN	0.809

tr B3KSZ1 B3KSZ1_HUMAN	0.716	tr H3BM67 H3BM67_HUMAN	0.714	tr H0Y8G4 H0Y8G4_HUMAN	0.811
sp P09669 COX6C_HUMAN	0.717	tr A0A087WZE4 A0A087WZE4_HUMAN	0.72	sp Q6ZP80 TM182_HUMAN	0.812
tr E7EQV9 E7EQV9_HUMAN	0.718	tr A2RRE0 A2RRE0_HUMAN	0.722	tr A0N5G5 A0N5G5_HUMAN	0.813
tr H0YBX2 H0YBX2_HUMAN	0.718	tr B3KM97 B3KM97_HUMAN	0.723	sp P35221 CTNA1_HUMAN	0.817
tr B2R6C0 B2R6C0_HUMAN	0.719	sp O95210 STBD1_HUMAN	0.728	tr Q6P528 Q6P528_HUMAN	0.818
tr A0A0A0MR33 A0A0A0MR33_HUMAN	0.719	sp Q2TAY7 SMU1_HUMAN	0.729	sp Q06828 FMOD_HUMAN	0.821
tr H7BXZ6 H7BXZ6_HUMAN	0.719	sp Q05707 COEA1_HUMAN	0.733	tr A5YM48 A5YM48_HUMAN	0.822
sp P23141 EST1_HUMAN	0.72	sp P23141 EST1_HUMAN	0.733	sp Q86TP1 PRUNE_HUMAN	0.822
tr H0YI09 H0YI09_HUMAN	0.721	sp Q9H7C9 AAMDC_HUMAN	0.733	tr K7EMC7 K7EMC7_HUMAN	0.822
tr B4DMD3 B4DMD3_HUMAN	0.722	sp P05154 IPSP_HUMAN	0.737	sp Q8NDY3 ARHL1_HUMAN	0.823
tr B7Z601 B7Z601_HUMAN	0.722	tr B4DI75 B4DI75_HUMAN	0.738	tr A0A0A0MQY0 A0A0A0MQY0_HUMAN	0.824
tr D3DVH1 D3DVH1_HUMAN	0.726	tr H0YL90 H0YL90_HUMAN	0.74	tr A5PLL0 A5PLL0_HUMAN	0.824
sp P61626 LYSC_HUMAN	0.728	tr K7ER74 K7ER74_HUMAN	0.74	sp Q07507 DERM_HUMAN	0.825
sp Q14008 CKAP5_HUMAN	0.731	tr B3KSZ1 B3KSZ1_HUMAN	0.741	sp O60237 MYPT2_HUMAN	0.826
sp P55001 MFAP2_HUMAN	0.731	tr V9GYG9 V9GYG9_HUMAN	0.741	tr H0YIV4 H0YIV4_HUMAN	0.826
tr H3BUX2 H3BUX2_HUMAN	0.734	sp Q9Y676 RT18B_HUMAN	0.741	sp P02768 ALBU_HUMAN	0.827
sp P05154 IPSP_HUMAN	0.737	tr A0A024R172 A0A024R172_HUMAN	0.743	sp Q9UBY9 HSPB7_HUMAN	0.828
tr Q7Z3Z1 Q7Z3Z1_HUMAN	0.737	tr B2R773 B2R773_HUMAN	0.743	sp Q9NQC3 RTN4_HUMAN	0.83
tr A0A024R248 A0A024R248_HUMAN	0.737	tr U3KPS2 U3KPS2_HUMAN	0.745	sp Q96DG6 CMBL_HUMAN	0.83
tr Q6ZN40 Q6ZN40_HUMAN	0.738	tr Q5VY30 Q5VY30_HUMAN	0.747	sp O94811 TPPP_HUMAN	0.831
sp P23142 FBLN1_HUMAN	0.739	tr V9HW62 V9HW62_HUMAN	0.753	sp Q9Y6I3 EPN1_HUMAN	0.831
tr B1AP13 B1AP13_HUMAN	0.74	tr J3KQY1 J3KQY1_HUMAN	0.755	tr B4DFP1 B4DFP1_HUMAN	0.832
sp Q9H7C9 AAMDC_HUMAN	0.74	sp Q9UJS0 CMC2_HUMAN	0.755	tr H0Y9H2 H0Y9H2_HUMAN	0.833
sp P68133 ACTS_HUMAN	0.74	sp P23142 FBLN1_HUMAN	0.756	tr Q53GL5 Q53GL5_HUMAN	1.202
sp Q9UBG0 MRC2_HUMAN	0.742	tr A0A087X0E2 A0A087X0E2_HUMAN	0.756	tr B4DWA5 B4DWA5_HUMAN	1.204
tr H3BNX8 H3BNX8_HUMAN	0.746	tr H3BN14 H3BN14_HUMAN	0.757	sp Q96CN7 ISOC1_HUMAN	1.204
tr E9PN17 E9PN17_HUMAN	0.747	tr A0A087WXX9 A0A087WXX9_HUMAN	0.758	tr B4DZG7 B4DZG7_HUMAN	1.204
tr I3L0E3 I3L0E3_HUMAN	0.751	sp P21397 AOFA_HUMAN	0.759	sp Q9GZM7 TINAL_HUMAN	1.204

sp O60240 PLIN1_HUMAN	0.753	tr B4DNG0 B4DNG0_HUMAN	0.761	tr J3KS22 J3KS22_HUMAN	1.205
tr Q5VY30 Q5VY30_HUMAN	0.756	sp Q7L311 ARMX2_HUMAN	0.761	sp P23396 RS3_HUMAN	1.207
tr A0A059U7G5 A0A059U7G5_HUMAN	0.757	sp Q9HCB6 SPON1_HUMAN	0.763	tr B0QYK0 B0QYK0_HUMAN	1.207
sp Q4G176 ACSF3_HUMAN	0.758	tr A0A024R825 A0A024R825_HUMAN	0.767	sp P09669 COX6C_HUMAN	1.209
sp P48047 ATPO_HUMAN	0.759	tr B4DMD3 B4DMD3_HUMAN	0.772	tr E7EQV9 E7EQV9_HUMAN	1.211
sp P21397 AOFA_HUMAN	0.759	tr A5PLL0 A5PLL0_HUMAN	0.773	sp Q9NZM1 MYOF_HUMAN	1.212
tr B4DX19 B4DX19_HUMAN	0.763	sp P54652 HSP72_HUMAN	0.773	tr B2R5W3 B2R5W3_HUMAN	1.212
tr Q2TB59 Q2TB59_HUMAN	0.763	tr B4DXZ6 B4DXZ6_HUMAN	0.774	tr B0QYN7 B0QYN7_HUMAN	1.214
tr A0A0A0MTQ5 A0A0A0MTQ5_HUMAN	0.764	sp O00264 PGRC1_HUMAN	0.777	sp P13010 XRCC5_HUMAN	1.215
tr D3DWJ7 D3DWJ7_HUMAN	0.764	tr A2RTY6 A2RTY6_HUMAN	0.777	sp Q96IX5 USMG5_HUMAN	1.217
sp P41222 PTGDS_HUMAN	0.766	tr L8E853 L8E853_HUMAN	0.785	sp Q92506 DHB8_HUMAN	1.218
sp Q96IX5 USMG5_HUMAN	0.766	tr H3BUX2 H3BUX2_HUMAN	0.788	tr B7Z9B8 B7Z9B8_HUMAN	1.219
tr A0A087X130 A0A087X130_HUMAN	0.768	tr D3DXF2 D3DXF2_HUMAN	0.791	sp Q8NBX0 SCPDL_HUMAN	1.22
sp P21912 SDHB_HUMAN	0.772	sp P43652 AFAM_HUMAN	0.795	tr D3DVH1 D3DVH1_HUMAN	1.22
tr A0A024R4D5 A0A024R4D5_HUMAN	0.772	sp Q6ZP80 TM182_HUMAN	0.795	tr A0A087WU72 A0A087WU72_HUMAN	1.221
sp Q6UWY5 OLFL1_HUMAN	0.772	tr A0A087X130 A0A087X130_HUMAN	0.796	tr E2RVJ0 E2RVJ0_HUMAN	1.224
tr Q9NSD0 Q9NSD0_HUMAN	0.775	tr A0A024R2W4 A0A024R2W4_HUMAN	0.797	tr H3BN14 H3BN14_HUMAN	1.227
sp Q9NZ08 ERAP1_HUMAN	0.776	tr B4DVE1 B4DVE1_HUMAN	0.8	tr H0YMF4 H0YMF4_HUMAN	1.228
sp P23368 MAOM_HUMAN	0.776	tr A0A024R1X8 A0A024R1X8_HUMAN	0.801	tr A6XNE2 A6XNE2_HUMAN	1.228
sp Q13057 COASY_HUMAN	0.776	sp Q9BX97 PLVAP_HUMAN	0.801	tr A9LSU1 A9LSU1_HUMAN	1.23
sp O00264 PGRC1_HUMAN	0.776	sp P02768 ALBU_HUMAN	0.802	tr A0A0A0MSZ4 A0A0A0MSZ4_HUMAN	1.234
tr A8JZZ8 A8JZZ8_HUMAN	0.777	tr B7Z5J1 B7Z5J1_HUMAN	0.803	sp O76076 WISP2_HUMAN	1.238
sp Q9BS92 NPS3B_HUMAN	0.777	tr A5YM48 A5YM48_HUMAN	0.805	tr A0A024R825 A0A024R825_HUMAN	1.238
tr A0A024R9B9 A0A024R9B9_HUMAN	0.779	sp P26678 PPLA_HUMAN	0.806	tr E5RHP7 E5RHP7_HUMAN	1.242
tr A0A087WT47 A0A087WT47_HUMAN	0.781	tr B4DGU4 B4DGU4_HUMAN	0.806	sp Q03135 CAV1_HUMAN	1.249

HUMAN

tr A0A024R172 A0A024R172_HUMAN	0.786	tr Q5T190 Q5T190_HUMAN	0.811	tr A0A0A0MSQ0 A0A0A0MSQ0_HUMAN	1.251
tr B4DZL5 B4DZL5_HUMAN	0.786	tr S6BAR0 S6BAR0_HUMAN	0.812	tr Q6IB58 Q6IB58_HUMAN	1.251
tr B2RDE0 B2RDE0_HUMAN	0.788	sp Q9BU61 NDUF3_HUMAN	0.82	sp P12429 ANXA3_HUMAN	1.253
tr B4E2J1 B4E2J1_HUMAN	0.789	sp P05546 HEP2_HUMAN	0.821	sp Q16853 AOC3_HUMAN	1.255
tr Q53FC3 Q53FC3_HUMAN	0.792	sp P52179 MYOM1_HUMAN	0.821	tr A8K1D2 A8K1D2_HUMAN	1.256
sp P82673 RT35_HUMAN	0.795	tr A0A087WUF6 A0A087WUF6_HUMAN	0.821	tr H0YG03 H0YG03_HUMAN	1.256
tr B4DVV3 B4DVV3_HUMAN	0.796	tr C9J712 C9J712_HUMAN	0.822	tr E9PLM6 E9PLM6_HUMAN	1.258
sp P14555 PA2GA_HUMAN	0.796	tr B4DFP1 B4DFP1_HUMAN	0.824	sp P10915 HPLN1_HUMAN	1.261
sp O95210 STBD1_HUMAN	0.797	tr B0AZQ4 B0AZQ4_HUMAN	0.825	tr H9E7F4 H9E7F4_HUMAN	1.263
tr A0A0A0MTR1 A0A0A0MTR1_HUMAN	0.797	sp Q9H2M9 RBGPR_HUMAN	0.825	sp Q8WWP7 GIMA1_HUMAN	1.263
tr M0R0P7 M0R0P7_HUMAN	0.798	tr B7Z8A2 B7Z8A2_HUMAN	0.829	tr A0A024QZE7 A0A024QZE7_HUMAN	1.264
tr A0A024R4Y7 A0A024R4Y7_HUMAN	0.798	sp Q9HBL7 PLRKT_HUMAN	0.829	sp Q9NZN4 EHD2_HUMAN	1.265
sp Q8N5K1 CISD2_HUMAN	0.8	sp Q6UXB8 PI16_HUMAN	0.83	sp Q969Z3 MARC2_HUMAN	1.267
tr B4DVZ0 B4DVZ0_HUMAN	0.801	tr B4E2J1 B4E2J1_HUMAN	0.831	sp P06899 H2B1J_HUMAN	1.268
tr H0YHA7 H0YHA7_HUMAN	0.807	tr A0A024R1E2 A0A024R1E2_HUMAN	0.831	sp O95631 NET1_HUMAN	1.268
sp Q07507 DERM_HUMAN	0.811	tr A0A024R9U8 A0A024R9U8_HUMAN	0.832	tr B2RA03 B2RA03_HUMAN	1.27
sp P14854 CX6B1_HUMAN	0.813	sp Q99959 PKP2_HUMAN	0.832	tr Q6LAP8 Q6LAP8_HUMAN	1.273
tr B3KUE5 B3KUE5_HUMAN	0.814	sp O00483 NDUA4_HUMAN	0.832	tr B4DTY8 B4DTY8_HUMAN	1.276
sp A2RTX5 SYTC2_HUMAN	0.816	tr B4DZL5 B4DZL5_HUMAN	0.832	tr J3QRS3 J3QRS3_HUMAN	1.276
tr A8K9B2 A8K9B2_HUMAN	0.816	tr Q59HA3 Q59HA3_HUMAN	1.202	sp P20700 LMNB1_HUMAN	1.279
sp O75947 ATP5H_HUMAN	0.817	sp Q06323 PSME1_HUMAN	1.203	tr F2Z3A7 F2Z3A7_HUMAN	1.282
sp Q9Y230 RUVB2_HUMAN	0.818	tr M0QXK2 M0QXK2_HUMAN	1.203	tr Q0D2M2 Q0D2M2_HUMAN	1.286
sp P27338 AOFB_HUMAN	0.82	sp P23381 SYWC_HUMAN	1.204	tr B2RA94 B2RA94_HUMAN	1.292
sp Q8WVV4 POF1B_HUMAN	0.82	tr E7EVA0 E7EVA0_HUMAN	1.204	sp Q8N5M1 ATPF2_HUMAN	1.293
tr F8W1A4 F8W1A4_HUMAN	0.82	sp P29218 IMPA1_HUMAN	1.206	tr G3V1V0 G3V1V0_HUMAN	1.294
sp Q9NPJ3 ACO13_HUMAN	0.821	sp Q9NWV4 CA123_HUMAN	1.207	sp O60240 PLIN1_HUMAN	1.296
tr A0A024RBE8 A0A024RBE8_HUMAN	0.821	tr D6RGG3 D6RGG3_HUMAN	1.207	tr B4E380 B4E380_HUMAN	1.296

HUMAN

tr B4DNG0 B4DNG0_HUMAN	0.824	tr A0A087WSV8 A0A087WSV8_HUMAN	1.207	sp P02649 APOE_HUMAN	1.299
tr B7Z5J1 B7Z5J1_HUMAN	0.824	sp Q9UII2 ATIF1_HUMAN	1.207	sp P08572 CO4A2_HUMAN	1.301
tr Q5T8U5 Q5T8U5_HUMAN	0.824	tr Q5CZH6 Q5CZH6_HUMAN	1.208	sp P08729 K2C7_HUMAN	1.306
sp Q8WW59 SPRY4_HUMAN	0.826	sp P61604 CH10_HUMAN	1.209	sp P00918 CAH2_HUMAN	1.308
sp Q96FQ6 S10AG_HUMAN	0.827	sp P61970 NTF2_HUMAN	1.209	sp Q15417 CNN3_HUMAN	1.312
sp P25325 THTM_HUMAN	0.828	sp P07360 CO8G_HUMAN	1.212	sp Q969G5 PRDBP_HUMAN	1.318
tr A0A024RDX4 A0A024RDX4_HUMAN	0.829	tr B3KSI7 B3KSI7_HUMAN	1.213	tr Q6ZN40 Q6ZN40_HUMAN	1.322
sp Q13425 SNTB2_HUMAN	0.829	tr A0A024R258 A0A024R258_HUMAN	1.214	tr Q5IWS5 Q5IWS5_HUMAN	1.322
sp Q9BX97 PLVAP_HUMAN	0.83	sp P05387 RLA2_HUMAN	1.214	tr H0YGX7 H0YGX7_HUMAN	1.323
sp P14927 QCR7_HUMAN	0.831	sp A2RTX5 SYTC2_HUMAN	1.216	tr B4E200 B4E200_HUMAN	1.337
sp P43652 AFAM_HUMAN	0.832	tr B2RDQ3 B2RDQ3_HUMAN	1.217	sp Q15746 MYLK_HUMAN	1.346
tr M0QYS1 M0QYS1_HUMAN	0.833	sp Q5R372 RBG1L_HUMAN	1.217	tr Q59FG9 Q59FG9_HUMAN	1.362
tr K7ESP4 K7ESP4_HUMAN	0.833	tr B3KM80 B3KM80_HUMAN	1.219	sp P05109 S10A8_HUMAN	1.38
sp P19652 A1AG2_HUMAN	1.201	sp P62857 RS28_HUMAN	1.219	tr B2ZGL7 B2ZGL7_HUMAN	1.381
tr Q15374 Q15374_HUMAN	1.202	sp P32418 NAC1_HUMAN	1.22	sp P02042 HBD_HUMAN	1.385
tr K7EKW4 K7EKW4_HUMAN	1.203	tr B2RB23 B2RB23_HUMAN	1.22	tr B7Z832 B7Z832_HUMAN	1.389
tr Q5RKT7 Q5RKT7_HUMAN	1.203	tr A0A090N8G0 A0A090N8G0_HUMAN	1.223	tr A0A024QZJ6 A0A024QZJ6_HUMAN	1.393
tr B4DS05 B4DS05_HUMAN	1.203	tr B4E200 B4E200_HUMAN	1.224	tr A0A024R035 A0A024R035_HUMAN	1.398
sp P31946 1433B_HUMAN	1.203	sp Q96QR8 PURB_HUMAN	1.224	sp Q02338 BDH_HUMAN	1.417
sp P01616 KV203_HUMAN	1.205	tr H0YCP8 H0YCP8_HUMAN	1.225	sp A2RTX5 SYTC2_HUMAN	1.425
tr Q5U043 Q5U043_HUMAN	1.208	tr J3KQ99 J3KQ99_HUMAN	1.225	sp P49327 FAS_HUMAN	1.43
tr B3KSI7 B3KSI7_HUMAN	1.208	tr Q32Q10 Q32Q10_HUMAN	1.225	sp Q01469 FABP5_HUMAN	1.436
tr H0Y7A7 H0Y7A7_HUMAN	1.208	tr B3KRM8 B3KRM8_HUMAN	1.226	tr B4DEA7 B4DEA7_HUMAN	1.454
tr Q53Y47 Q53Y47_HUMAN	1.211	sp Q09028 RBBP4_HUMAN	1.227	tr B2R941 B2R941_HUMAN	1.458
tr G3V4P8 G3V4P8_HUMAN	1.211	tr B4E0U6 B4E0U6_HUMAN	1.227	sp O43707 ACTN4_HUMAN	1.473
sp Q92890 UFD1_HUMAN	1.211	tr H3BRU6 H3BRU6_HUMAN	1.23	tr B3KUB8 B3KUB8_HUMAN	1.481
sp P06727 APOA4_HUMAN	1.212	sp Q8WUW1 BRK1_HUMAN	1.23	tr B2R4M6 B2R4M6_HUMAN	1.487
tr Q4G1C4 Q4G1C4_HUMAN	1.212	tr Q3LIE9 Q3LIE9_HUMAN	1.231	tr A0A024QZ34 A0A024QZ34_HUMAN	1.499

tr A0A087WUQ6 A0A087WUQ6_HUMAN	1.213	sp P26885 FKBP2_HUMAN	1.232	sp P15121 ALDR_HUMAN	1.511
sp Q15746 MYLK_HUMAN	1.213	sp P26447 S10A4_HUMAN	1.232	tr B4DVZ0 B4DVZ0_HUMAN	1.524
tr E7EMG9 E7EMG9_HUMAN	1.214	sp P0C0S5 H2AZ_HUMAN	1.232	sp P05787 K2C8_HUMAN	1.531
tr H3BPK3 H3BPK3_HUMAN	1.215	sp O75368 SH3L1_HUMAN	1.233	tr J3QRN6 J3QRN6_HUMAN	1.538
tr V9HW38 V9HW38_HUMAN	1.215	sp O00151 PDLI1_HUMAN	1.235	sp P51911 CNN1_HUMAN	1.54
sp Q9BX66 SRBS1_HUMAN	1.216	sp Q15435 PP1R7_HUMAN	1.235	tr E9PIM6 E9PIM6_HUMAN	1.545
sp P37837 TALDO_HUMAN	1.216	tr Q53Y47 Q53Y47_HUMAN	1.236	tr G3XAP6 G3XAP6_HUMAN	1.549
sp Q9H479 FN3K_HUMAN	1.218	tr Q15374 Q15374_HUMAN	1.236	sp P59665 DEF1_HUMAN	1.551
sp Q04917 1433F_HUMAN	1.22	tr A9LSU1 A9LSU1_HUMAN	1.237	sp A2RUH7 MBPHL_HUMAN	1.574
sp Q15843 NEDD8_HUMAN	1.22	tr B2R6C0 B2R6C0_HUMAN	1.239	sp P31146 COR1A_HUMAN	1.61
tr A0A0A0MSG2 A0A0A0MSG2_HUMAN	1.221	sp Q9Y5S9 RBM8A_HUMAN	1.241	sp P08493 MGP_HUMAN	1.676
tr Q59EG0 Q59EG0_HUMAN	1.223	sp O95433 AHSA1_HUMAN	1.243	tr B3KVC9 B3KVC9_HUMAN	1.68
sp Q96JB5 CK5P3_HUMAN	1.225	sp P13929 ENOB_HUMAN	1.244	tr B3KTQ2 B3KTQ2_HUMAN	1.685
tr B2R4M6 B2R4M6_HUMAN	1.226	tr B3KX72 B3KX72_HUMAN	1.244	sp Q9NR12 PDLI7_HUMAN	1.695
sp P13929 ENOB_HUMAN	1.231	sp P43490 NAMPT_HUMAN	1.245	tr I1VZV6 I1VZV6_HUMAN	1.76
sp P61158 ARP3_HUMAN	1.232	sp P68036 UB2L3_HUMAN	1.245	tr B2R6C0 B2R6C0_HUMAN	1.768
sp O15144 ARPC2_HUMAN	1.233	tr A0A087WXM6 A0A087WXM6_HUMAN	1.247	sp P02747 C1QC_HUMAN	1.782
sp P35579 MYH9_HUMAN	1.234	tr B3KM95 B3KM95_HUMAN	1.247	sp O75339 CILP1_HUMAN	1.816
sp Q9UJY1 HSPB8_HUMAN	1.234	sp O75369 FLNB_HUMAN	1.247	tr B3KRN4 B3KRN4_HUMAN	1.931
tr A0A090N8G0 A0A090N8G0_HUMAN	1.236	tr Q6FIE5 Q6FIE5_HUMAN	1.248	sp P61626 LYSC_HUMAN	1.949
tr B5BTY4 B5BTY4_HUMAN	1.239	tr A8K4G7 A8K4G7_HUMAN	1.249	sp P02743 SAMP_HUMAN	2.128
sp Q16082 HSPB2_HUMAN	1.239	sp Q13103 SPP24_HUMAN	1.249	tr X6RLJ0 X6RLJ0_HUMAN	2.168
sp Q13442 HAP28_HUMAN	1.239	tr B3KTA3 B3KTA3_HUMAN	1.251	sp Q8N474 SFRP1_HUMAN	2.428
sp P19623 SPEE_HUMAN	1.24	sp Q9NR28 DBLOH_HUMAN	1.251	sp P48061 SDF1_HUMAN	2.448
sp Q9UMX5 NENF_HUMAN	1.241	sp Q15293 RCN1_HUMAN	1.251	tr A1KY36 A1KY36_HUMAN	2.539
sp P63104 1433Z_HUMAN	1.243	sp Q96AG4 LRC59_HUMAN	1.255	sp P15090 FABP4_HUMAN	2.616
sp Q4KWH8 PLCH1_HUMAN	1.246	tr A0A024R5M3 A0A024R5M3_HUMAN	1.256		
sp P62820 RAB1A_HUMAN	1.249	tr M0QYT0 M0QYT0_HUMAN	1.257		
sp Q9BW30 TPPP3_HUMAN	1.249	tr B3KN06 B3KN06_HUMAN	1.257		
sp Q13103 SPP24_HUMAN	1.25	sp Q9NZA1 CLIC5_HUMAN	1.258		

sp O15061 SYNEM_HUMAN	1.25	tr H0Y614 H0Y614_HUMAN	1.258
tr A0A024QZT9 A0A024QZT9_HUMAN	1.251	tr A0A087WYR3 A0A087WYR3_HUMAN	1.26
sp Q9NP98 MYOZ1_HUMAN	1.254	tr J3KR44 J3KR44_HUMAN	1.26
sp Q02252 MMSA_HUMAN	1.255	tr X6RFL8 X6RFL8_HUMAN	1.26
sp O95393 BMP10_HUMAN	1.255	sp Q9UMX5 NENF_HUMAN	1.261
sp Q15435 PP1R7_HUMAN	1.255	tr B2RAY1 B2RAY1_HUMAN	1.261
sp P31146 COR1A_HUMAN	1.257	sp O43776 SYNC_HUMAN	1.261
tr A0A087WTH0 A0A087WTH0_HUMAN	1.257	sp Q96JB5 CK5P3_HUMAN	1.262
tr M0QXF9 M0QXF9_HUMAN	1.258	sp P31946 1433B_HUMAN	1.263
sp Q9GZM7 TINAL_HUMAN	1.258	sp Q03135 CAV1_HUMAN	1.264
sp P09211 GSTP1_HUMAN	1.259	tr B4DQ92 B4DQ92_HUMAN	1.265
tr B4DH02 B4DH02_HUMAN	1.26	tr B3KXD1 B3KXD1_HUMAN	1.268
tr E9PB61 E9PB61_HUMAN	1.261	tr Q9UL89 Q9UL89_HUMAN	1.269
sp P07737 PROF1_HUMAN	1.261	tr Q53FI7 Q53FI7_HUMAN	1.269
tr Q6FIE5 Q6FIE5_HUMAN	1.262	sp Q4KWH8 PLCH1_HUMAN	1.271
tr D6RAW2 D6RAW2_HUMAN	1.262	tr B4DVZ0 B4DVZ0_HUMAN	1.273
sp P19022 CADH2_HUMAN	1.266	sp P61586 RHOA_HUMAN	1.273
tr A0A0A0MQY0 A0A0A0MQY0_HUMAN	1.271	tr A0A0A0MTH3 A0A0A0MTH3_HUMAN	1.278
tr A0A0A0MSQ0 A0A0A0MSQ0_HUMAN	1.271	tr Q5U071 Q5U071_HUMAN	1.279
sp Q14315 FLNC_HUMAN	1.271	tr Q5U043 Q5U043_HUMAN	1.28
tr A0A087WYR3 A0A087WYR3_HUMAN	1.273	tr A0A087X1K9 A0A087X1K9_HUMAN	1.28
sp P26038 MOES_HUMAN	1.275	sp Q96D15 RCN3_HUMAN	1.28
tr J3KQ99 J3KQ99_HUMAN	1.278	tr B4E2A3 B4E2A3_HUMAN	1.284
tr A1L172 A1L172_HUMAN	1.279	sp Q02252 MMSA_HUMAN	1.284
sp Q9UBY9 HSPB7_HUMAN	1.28	tr A0A087WTH0 A0A087WTH0_HUMAN	1.284
sp P35754 GLRX1_HUMAN	1.282	tr B2R5W3 B2R5W3_HUMAN	1.286
tr Q8TCF0 Q8TCF0_HUMAN	1.283	tr B4DWC4 B4DWC4_HUMAN	1.286
sp Q9H987 SYP2L_HUMAN	1.284	tr Q5JNW7 Q5JNW7_HUMAN	1.287
sp P07305 H10_HUMAN	1.284	tr Q5RKT7 Q5RKT7_HUMAN	1.291

tr A0A024R895 A0A024R895_HUMAN	1.286	sp Q0ZGT2 NEXN_HUMAN	1.291
sp Q8WW22 DNJA4_HUMAN	1.288	tr Q6P528 Q6P528_HUMAN	1.291
sp Q01995 TAGL_HUMAN	1.288	tr A0A024R9E2 A0A024R9E2_HUMAN	1.292
tr G3V1V0 G3V1V0_HUMAN	1.292	sp P19021 AMD_HUMAN	1.296
sp Q13885 TBB2A_HUMAN	1.292	tr B4DWA5 B4DWA5_HUMAN	1.296
tr B3KXC3 B3KXC3_HUMAN	1.293	sp Q04917 1433F_HUMAN	1.299
sp Q01469 FABP5_HUMAN	1.293	sp Q8WW22 DNJA4_HUMAN	1.3
sp Q9HCH3 CPNE5_HUMAN	1.293	tr H0Y9H2 H0Y9H2_HUMAN	1.301
tr B3KXD1 B3KXD1_HUMAN	1.294	tr H0YL18 H0YL18_HUMAN	1.301
tr C9JC84 C9JC84_HUMAN	1.299	sp P52907 CAZA1_HUMAN	1.301
tr B5BUI8 B5BUI8_HUMAN	1.3	sp P62820 RAB1A_HUMAN	1.303
tr A0A024R091 A0A024R091_HUMAN	1.303	sp Q02338 BDH_HUMAN	1.305
tr B2R6M6 B2R6M6_HUMAN	1.303	tr B2R6S5 B2R6S5_HUMAN	1.305
sp O60237 MYPT2_HUMAN	1.305	tr A0A024R091 A0A024R091_HUMAN	1.306
tr F8WAR2 F8WAR2_HUMAN	1.305	tr A8K4V6 A8K4V6_HUMAN	1.306
tr H7BZJ3 H7BZJ3_HUMAN	1.308	sp Q9BX66 SRBS1_HUMAN	1.308
sp P78539 SRPX_HUMAN	1.309	tr B3KR50 B3KR50_HUMAN	1.308
tr Q59GM9 Q59GM9_HUMAN	1.31	sp P31949 S10AB_HUMAN	1.309
tr H0Y614 H0Y614_HUMAN	1.311	tr H0YIV4 H0YIV4_HUMAN	1.31
tr B2RAY1 B2RAY1_HUMAN	1.312	sp Q9BRA2 TXD17_HUMAN	1.31
tr B4DV28 B4DV28_HUMAN	1.316	tr B5BU25 B5BU25_HUMAN	1.313
sp P02671 FIBA_HUMAN	1.322	sp P07237 PDIA1_HUMAN	1.313
tr B4DWC4 B4DWC4_HUMAN	1.327	tr H3BPE7 H3BPE7_HUMAN	1.318
tr A0A087WZF1 A0A087WZF1_HUMAN	1.327	tr A0A087WXL8 A0A087WXL8_HUMAN	1.32
sp P07437 TBB5_HUMAN	1.336	tr B4DNP0 B4DNP0_HUMAN	1.321
sp Q07960 RHG01_HUMAN	1.337	tr C9J8S2 C9J8S2_HUMAN	1.323
tr A0A068LKR7 A0A068LKR7_HUMAN	1.34	sp P07305 H10_HUMAN	1.326
tr B2R6D7 B2R6D7_HUMAN	1.347	sp O15144 ARPC2_HUMAN	1.327
tr Q5U000 Q5U000_HUMAN	1.348	tr E7EQ72 E7EQ72_HUMAN	1.327

sp P35221 CTNA1_HUMAN	1.348	sp Q16543 CDC37_HUMAN	1.328
tr B2RDY9 B2RDY9_HUMAN	1.349	sp Q702N8 XIRP1_HUMAN	1.33
tr E7EVA0 E7EVA0_HUMAN	1.349	tr J3KS22 J3KS22_HUMAN	1.334
sp P09936 UCHL1_HUMAN	1.356	sp P31150 GDIA_HUMAN	1.338
tr A0A024RDA6 A0A024RDA6_HUMAN	1.357	tr B4DV28 B4DV28_HUMAN	1.339
sp Q15847 ADIRF_HUMAN	1.361	sp P20962 PTMS_HUMAN	1.339
tr B3KQK4 B3KQK4_HUMAN	1.363	sp Q9Y266 NUDC_HUMAN	1.34
sp Q702N8 XIRP1_HUMAN	1.364	tr Q7KZA3 Q7KZA3_HUMAN	1.343
sp O94811 TPPP_HUMAN	1.366	sp P26038 MOES_HUMAN	1.343
tr B4DEA6 B4DEA6_HUMAN	1.369	sp P61158 ARP3_HUMAN	1.344
sp P02763 A1AG1_HUMAN	1.369	tr Q6DEN2 Q6DEN2_HUMAN	1.345
sp Q9BUF5 TBB6_HUMAN	1.373	sp P23396 RS3_HUMAN	1.345
tr A4UCS6 A4UCS6_HUMAN	1.374	tr A0A024RDB4 A0A024RDB4_HUMAN	1.345
tr E9PGC8 E9PGC8_HUMAN	1.374	sp Q15181 IPYR_HUMAN	1.347
sp Q9UDY4 DNJB4_HUMAN	1.376	sp P01034 CYTC_HUMAN	1.35
sp P37802 TAGL2_HUMAN	1.381	sp P50897 PPT1_HUMAN	1.352
sp Q9BXX0 EMIL2_HUMAN	1.383	sp O15511 ARPC5_HUMAN	1.359
tr E5KN59 E5KN59_HUMAN	1.384	sp Q9NZU5 LMCD1_HUMAN	1.364
tr A8K3B0 A8K3B0_HUMAN	1.386	tr A0A024R895 A0A024R895_HUMAN	1.366
sp P04080 CYTB_HUMAN	1.388	tr F8WCF6 F8WCF6_HUMAN	1.368
sp Q9UHL4 DPP2_HUMAN	1.39	sp P02763 A1AG1_HUMAN	1.37
tr A0A024R6X1 A0A024R6X1_HUMAN	1.392	sp P07437 TBB5_HUMAN	1.373
sp Q9NR12 PDLI7_HUMAN	1.393	tr B4DKJ4 B4DKJ4_HUMAN	1.384
sp P15848 ARSB_HUMAN	1.393	tr J3KRG9 J3KRG9_HUMAN	1.386
tr Q9UL89 Q9UL89_HUMAN	1.4	tr B2R6M6 B2R6M6_HUMAN	1.387
sp Q0ZGT2 NEXN_HUMAN	1.409	tr A1L172 A1L172_HUMAN	1.396
sp P01619 KV301_HUMAN	1.415	tr B2RDY9 B2RDY9_HUMAN	1.397
tr B2R548 B2R548_HUMAN	1.416	tr B4DND4 B4DND4_HUMAN	1.4
sp Q9NZA1 CLIC5_HUMAN	1.423	tr A0A024RAM4 A0A024RAM4_HUMAN	1.402
sp O95817 BAG3_HUMAN	1.426	tr A0A024RDA6 A0A024RDA6	1.403

		_HUMAN	
tr J3KTF8 J3KTF8_HUMAN	1.431	sp P08294 SODE_HUMAN	1.406
sp P20962 PTMS_HUMAN	1.433	tr A0A087X1Z3 A0A087X1Z3_HUMAN	1.409
sp P00488 F13A_HUMAN	1.437	sp P62306 RUXF_HUMAN	1.412
tr A0A024RAF2 A0A024RAF2_HUMAN	1.437	tr M0QXF9 M0QXF9_HUMAN	1.417
sp Q14894 CRYM_HUMAN	1.441	sp P06727 APOA4_HUMAN	1.417
sp Q9NZN3 EHD3_HUMAN	1.444	tr A6XNE2 A6XNE2_HUMAN	1.427
tr B4DKJ4 B4DKJ4_HUMAN	1.447	tr J3KPM9 J3KPM9_HUMAN	1.429
tr A0A024R493 A0A024R493_HUMAN	1.45	tr K7EMY7 K7EMY7_HUMAN	1.434
sp P27348 I433T_HUMAN	1.451	tr V9HW38 V9HW38_HUMAN	1.435
sp P01903 DRA_HUMAN	1.461	sp P14550 AK1A1_HUMAN	1.438
sp P31150 GDIA_HUMAN	1.464	tr A8K3B0 A8K3B0_HUMAN	1.439
sp Q15417 CNN3_HUMAN	1.473	tr B5BUI8 B5BUI8_HUMAN	1.44
tr G3V3X5 G3V3X5_HUMAN	1.478	tr Q8TCF0 Q8TCF0_HUMAN	1.442
sp Q15942 ZYX_HUMAN	1.484	tr B0QYK0 B0QYK0_HUMAN	1.444
tr B4DUJ6 B4DUJ6_HUMAN	1.484	tr Q6N093 Q6N093_HUMAN	1.445
sp P12109 CO6A1_HUMAN	1.486	sp O95631 NET1_HUMAN	1.445
tr A0A087WUI4 A0A087WUI4_HUMAN	1.494	sp P00338 LDHA_HUMAN	1.447
sp P12110 CO6A2_HUMAN	1.498	sp P78539 SRPX_HUMAN	1.448
tr H0YIV4 H0YIV4_HUMAN	1.508	tr B4E3A8 B4E3A8_HUMAN	1.451
tr B4E3A8 B4E3A8_HUMAN	1.51	tr A0A024R493 A0A024R493_HUMAN	1.465
tr B2R6S5 B2R6S5_HUMAN	1.51	sp P37802 TAGL2_HUMAN	1.467
tr B3KXB8 B3KXB8_HUMAN	1.516	sp P61626 LYSC_HUMAN	1.471
tr Q6P528 Q6P528_HUMAN	1.517	tr E7EMG9 E7EMG9_HUMAN	1.472
tr A2A2D0 A2A2D0_HUMAN	1.523	sp Q9NZN3 EHD3_HUMAN	1.478
tr B4DI69 B4DI69_HUMAN	1.527	tr A0A024R0K2 A0A024R0K2_HUMAN	1.485
tr J3KRG9 J3KRG9_HUMAN	1.536	tr J3QRS3 J3QRS3_HUMAN	1.491
tr Q5STX8 Q5STX8_HUMAN	1.55	tr B3KM68 B3KM68_HUMAN	1.496
sp Q6EEV6 SUMO4_HUMAN	1.553	tr W6A4U0 W6A4U0_HUMAN	1.498

sp P0C0L5 CO4B_HUMAN	1.566	tr B4DI69 B4DI69_HUMAN	1.498
sp P08311 CATG_HUMAN	1.59	tr B5BUB5 B5BUB5_HUMAN	1.499
tr Q53FB0 Q53FB0_HUMAN	1.601	sp P27348 1433T_HUMAN	1.505
tr Q53FB6 Q53FB6_HUMAN	1.609	sp Q07960 RHG01_HUMAN	1.508
sp P67936 TPM4_HUMAN	1.62	sp P04080 CYTB_HUMAN	1.51
tr B4DEX8 B4DEX8_HUMAN	1.622	tr B4DEA6 B4DEA6_HUMAN	1.511
sp P50461 CSRP3_HUMAN	1.622	tr A8K1D2 A8K1D2_HUMAN	1.512
tr Q3B874 Q3B874_HUMAN	1.65	sp P07737 PROF1_HUMAN	1.514
sp P51911 CNN1_HUMAN	1.651	sp P08493 MGP_HUMAN	1.518
tr W6A4U0 W6A4U0_HUMAN	1.661	sp P0C0L5 CO4B_HUMAN	1.522
tr Q6N093 Q6N093_HUMAN	1.664	tr A0A087WZF1 A0A087WZF1_HUMAN	1.523
tr B4DL49 B4DL49_HUMAN	1.708	tr B2R941 B2R941_HUMAN	1.535
sp P18065 IBP2_HUMAN	1.765	tr E5KN59 E5KN59_HUMAN	1.537
tr H0YGX7 H0YGX7_HUMAN	1.793	sp Q6EEV6 SUMO4_HUMAN	1.543
tr A0A024QZX5 A0A024QZX5_HUMAN	1.804	tr A0A087WUS0 A0A087WUS0_HUMAN	1.558
sp Q8TAE6 PP14C_HUMAN	1.808	sp P15121 ALDR_HUMAN	1.56
tr H0Y5J4 H0Y5J4_HUMAN	1.857	tr B4DVR4 B4DVR4_HUMAN	1.56
tr A0A075B6R9 A0A075B6R9_HUMAN	2.071	tr A0A024RAF2 A0A024RAF2_HUMAN	1.563
tr H3BRN4 H3BRN4_HUMAN	2.089	tr A2A2D0 A2A2D0_HUMAN	1.568
tr C9JWC3 C9JWC3_HUMAN	2.149	sp O75339 CILP1_HUMAN	1.568
tr B7Z6G4 B7Z6G4_HUMAN	2.151	tr Q53FB0 Q53FB0_HUMAN	1.572
tr A0A5E4 A0A5E4_HUMAN	2.432	tr B3KXB8 B3KXB8_HUMAN	1.579
tr A0A024R884 A0A024R884_HUMAN	2.603	tr B4DUJ6 B4DUJ6_HUMAN	1.581
		tr A0A0A0MSQ0 A0A0A0MSQ0_HUMAN	1.588
		tr A0A024QZJ6 A0A024QZJ6_HUMAN	1.593
		sp P12111 CO6A3_HUMAN	1.594
		tr A0A075B6R9 A0A075B6R9_HUMAN	1.609
		tr C9JWC3 C9JWC3_HUMAN	1.61

sp P01903 DRA_HUMAN	1.614
tr J3KTF8 J3KTF8_HUMAN	1.618
tr Q7Z5G3 Q7Z5G3_HUMAN	1.638
sp P02747 C1QC_HUMAN	1.643
tr Q53FB6 Q53FB6_HUMAN	1.662
sp Q15942 ZYG_HUMAN	1.669
tr B3KUB8 B3KUB8_HUMAN	1.713
tr B4DL49 B4DL49_HUMAN	1.728
sp P05109 S10A8_HUMAN	1.739
sp P00488 F13A_HUMAN	1.751
sp P67936 TPM4_HUMAN	1.755
sp O43707 ACTN4_HUMAN	1.772
sp P35579 MYH9_HUMAN	1.784
sp Q969G5 PRDBP_HUMAN	1.79
tr B7Z832 B7Z832_HUMAN	1.799
sp Q15746 MYLK_HUMAN	1.803
tr B2R4M6 B2R4M6_HUMAN	1.817
sp P12110 CO6A2_HUMAN	1.828
tr A0A024QZX5 A0A024QZX5_HUMAN	1.853
sp Q01469 FABP5_HUMAN	1.854
sp P04004 VTNC_HUMAN	1.864
tr E9PIM6 E9PIM6_HUMAN	1.877
sp P50461 CSRP3_HUMAN	1.883
tr G3V1V0 G3V1V0_HUMAN	1.959
tr A0A0A0MSV6 A0A0A0MSV6_HUMAN	1.97
tr G3V3X5 G3V3X5_HUMAN	1.996
sp Q15417 CNN3_HUMAN	2.025
tr A0A087X094 A0A087X094_HUMAN	2.051
sp P48061 SDF1_HUMAN	2.057
tr B3KVC9 B3KVC9_HUMAN	2.071
tr Q6IBG1 Q6IBG1_HUMAN	2.119
tr A0A024R884 A0A024R884_H	2.16

UMAN	
sp P31146 COR1A_HUMAN	2.232
tr A0A5E4 A0A5E4_HUMAN	2.315
tr B3KRN4 B3KRN4_HUMAN	2.343
tr A0A087WUI4 A0A087WUI4_HUMAN	2.402
sp P18065 IBP2_HUMAN	2.402
tr H0YGX7 H0YGX7_HUMAN	2.451
tr X6RLJ0 X6RLJ0_HUMAN	2.638
sp Q8N474 SFRP1_HUMAN	2.758
tr B7Z6G4 B7Z6G4_HUMAN	2.772
sp P51911 CNN1_HUMAN	2.881
