

Proteomics insights into UO_2^{2+} species interactions with foetal bovine serum proteins

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Electronic Supplementary Information

Contents:

Figures S1-3, Table S1

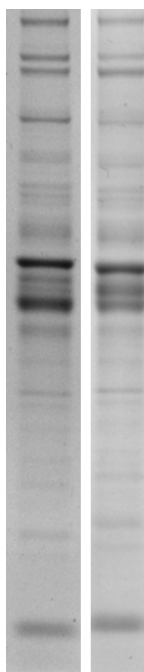


Figure S1. Gel electropherograms of UO_2^{2+} rich serum fraction form foetal bovine serum samples from different batches.

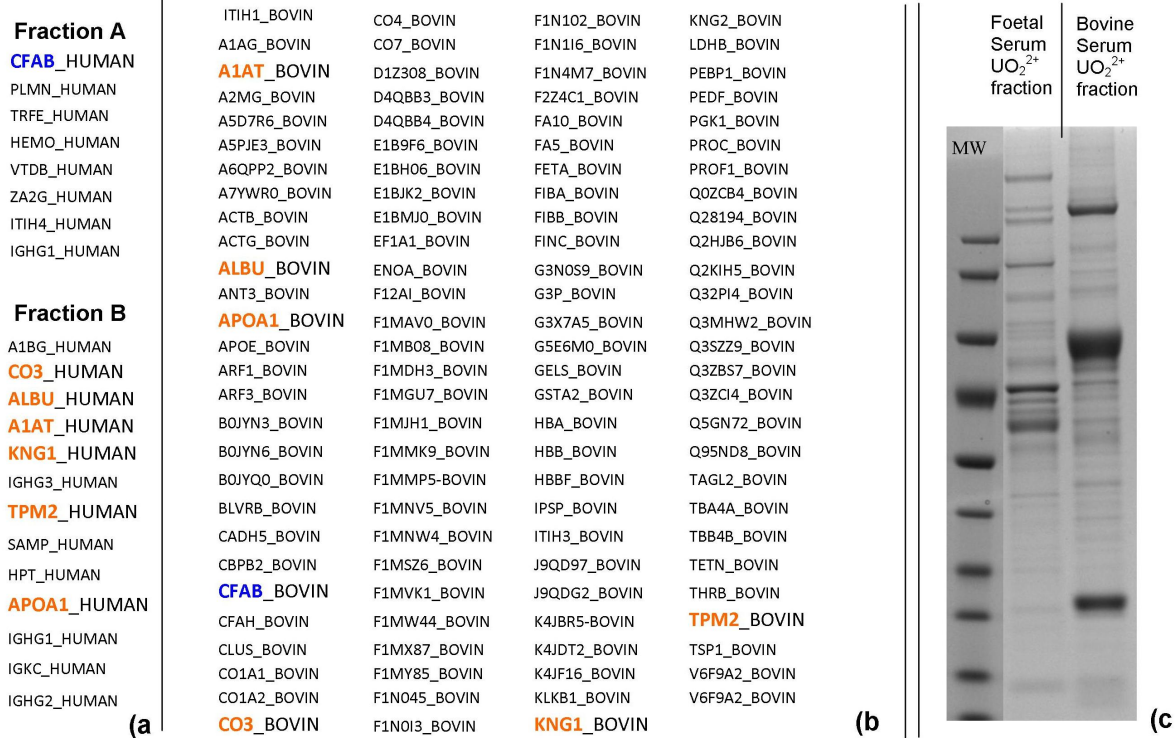
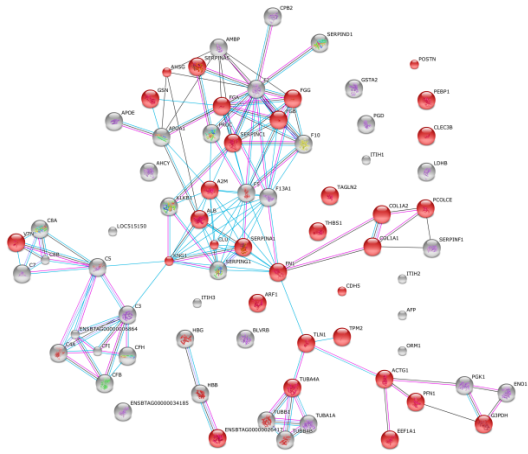
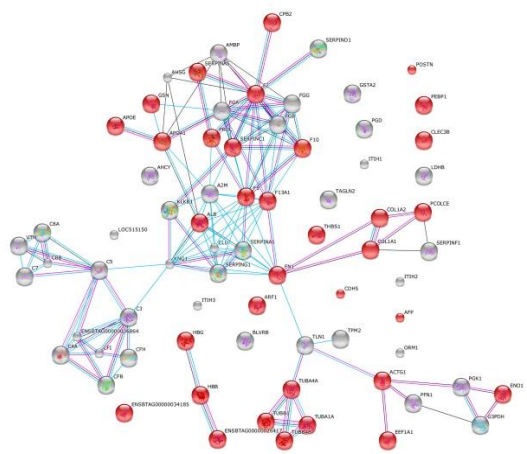


Figure S2. A) list of proteins identified in adult human serum based on affinity to immobilized UO_2^{2+} with more than 100 mmol/L of beads¹⁶ (we present proteins in the same format as in the original article). B) list of proteins identified in foetal serum (this work). The matching proteins in both sera were marked in blue and red. C) comparison of gel electropherograms of isolated high molecular weight complex from foetal bovine serum and adult bovine serum.



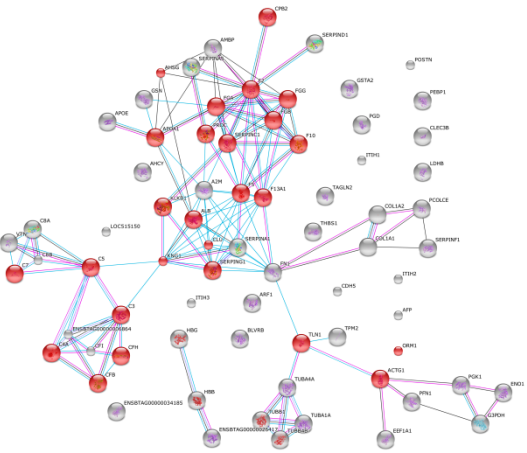
a) Protein binding



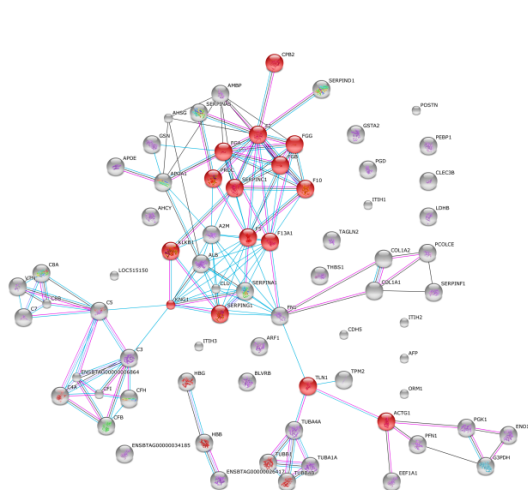
b) Ion binding



c) Heparin binding



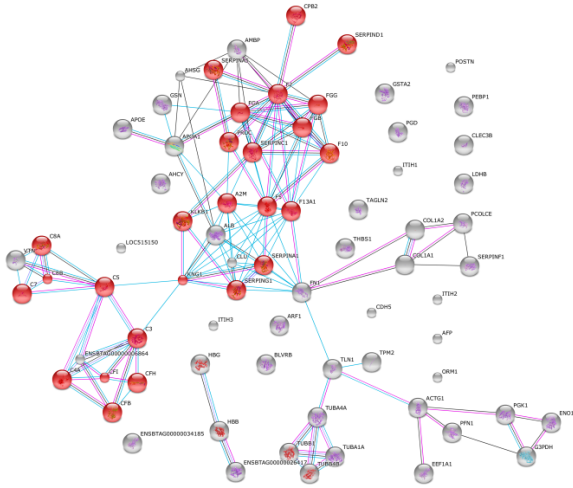
d) Response to stress



e) Blood coagulation



f) Regulation of protein metabolic process



g) Complement and coagulation cascades

Figure S3. The protein-protein interaction network of the proteins identified in complex with UO_2^{2+} species in foetal serum, red points correspond to the proteins with specific characteristics.

Table S1. The identified protein observed in the respective gel band after electrophoresis analysis of UO_2^{2+} enriched fraction.

Gel band	Full name	ACC number	Entry name	MS score	MS peptide	MW
1	Inter-alpha-trypsin inhibitor heavy chain H1	Q0VCM5	ITIH1_BOVIN	1915	17	101173
	Inter-alpha-trypsin inhibitor heavy chain H3	P56652	ITIH3_BOVIN	579	11	99489
	Alpha-2-macroglobulin	Q7SIH1	A2MG_BOVIN	367	9	167470
	Fibronectin	P07589	FINC_BOVIN	267	9	271983
2	Complement factor H	Q28085	CFAH_BOVIN	1489	35	140282
	Thrombospondin-1	Q28178	TSP1_BOVIN	455	13	129451
	Alpha-2-macroglobulin	Q7SIH1	A2MG_BOVIN	281	8	167470
3	Complement C3	Q2UVX4	CO3_BOVIN	2369	35	187135
	Alpha-2-macroglobulin	Q7SIH1	A2MG_BOVIN	152	5	167470
	Inter-alpha-trypsin inhibitor heavy chain H1	Q0VCM5	ITIH1_BOVIN	147	4	101173
4	Complement component C7	Q29RQ1	CO7_BOVIN	803	16	93029
	Complement factor B	P81187	CFAB_BOVIN	468	8	85312
	Alpha-2-macroglobulin	Q7SIH1	A2MG-BOVIN	284	7	167470
	Coagulation factor V	F1N0I3	F1N0I3_BOVIN	112	4	248828
5	Gelsolin	F1N1I6	F1N1I6_BOVIN	1202	19	85634
	Inter-alpha-trypsin inhibitor heavy chain H2	F1MNW4	F1MNW4_BOVIN	822	13	106090
	Inter-alpha-trypsin inhibitor heavy chain H2	A5D7R6	A5D7R6_BOVIN			106120
	Complement factor B	P81187	CFAB_BOVIN	779	15	85312
	Complement component C7	F1N045	F1N045_BOVIN	777	13	92929
	Complement component C7	Q29RQ1	CO7_BOVIN			92929
	Complement C3	Q2UVX4	CO3_BOVIN	675	13	187135
	Complement C3	G3X7A5	G3X7A5_BOVIN			187028
	Antithrombin-III	F1MSZ6	F1MSZ6_BOVIN	603	11	52407
	Antithrombin-III	P41361	ANT3_BOVIN			52314
	ALB protein	B0JYQ0	B0JYQ0_BOVIN	560	11	69248
	Serum albumin	P02769	ALBU_BOVIN			69248
	Periostin	D1Z308	D1Z308_BOVIN			93075
	Uncharacterized protein	G5E6M0	G5E6M0_BOVIN	450	10	93135
	Periostin variant 9	J9QD97	J9QD97_BOVIN			93101

Plasma serine protease inhibitor	Q9N2I2	IPSP_BOVIN	390	7	45268
Alpha-1-antiproteinase	P34955	A1AT_BOVIN	325	6	46075
Apolipoprotein A-I preproprotein	V6F9A2	V6F9A2_BOVIN	287	5	30258
SERPIND1 protein	A6QPP2	A6QPP2_BOVIN	266	6	55172
Alpha-2-macroglobulin variant 1	K4JBR5	K4JBR5_BOVIN			115118
Alpha-2-macroglobulin variant 20	K4JDT2	K4JDT2_BOVIN	226	6	98281
Alpha-2-macroglobulin variant 23	K4JF16	K4JF16_BOVIN			101296
Alpha-2-macroglobulin	Q7SIH1	A2MG_BOVIN			167470
Uncharacterized protein	Q3ZBS7	Q3ZBS7_BOVIN	254	4	53541
Plasma kallikrein	Q2KJ63	KLKB1_BOVIN	245	4	70948
Coagulation factor V	F1N0I3	F1N0I3_BOVIN	235	4	222078
Prothrombin	P00735	THRB_BOVIN	146	3	70461

6	Complement C3	Q2UVX4	CO3_BOVIN	1100	17	187135
	Complement C3	G3X7A5	G3X7A5_BOVIN			187028
	Gelsolin	F1MJH1	F1MJH1_BOVIN			80653
	Gelsolin	F1N1I6	F1N1I6_BOVIN	794	13	85634
	Gelsolin	Q3SX14	GELS_BOVIN			80681
	Inter-alpha-trypsin inhibitor heavy chain H1	Q0VCM5	ITIH1_BOVIN	724	13	101173
	Inter-alpha-trypsin inhibitor heavy chain H1	F1MMP5	F1MMP5_BOVIN			101174
	Alpha-fetoprotein	Q3SZ57	FETA_BOVIN	646	13	68543
	ALB protein	B0JYQ0	B0JYQ0_BOVIN	638	12	69248
	Serum albumin	P02769	ALBU_BOVIN			69248
	Uncharacterized protein	E1BMJ0	E1BMJ0_BOVIN	570	10	51679
	Coagulation factor XIII A chain	F1MW44	F1MW44_BOVIN	565	10	82623
	Uncharacterized protein	F1MVK1	F1MVK1_BOVIN	564	12	173864
	Inter-alpha-trypsin inhibitor heavy chain H2	F1MNV4	F1MNV4_BOVIN	547	10	106090
	Inter-alpha-trypsin inhibitor heavy chain H2	A5D7R6	A5D7R6_BOVIN			106120
	Hemoglobin fetal subunit beta	P02081	HBBF_BOVIN	521	8	15849
	Uncharacterized protein	E1BH06	E1BH06_BOVIN	513	11	192644
	Uncharacterized protein	Q3ZBS7	Q3ZBS7_BOVIN	504	8	53541
	Alpha-1-antiproteinase	P34955	A1AT_BOVIN	396	6	46075
	Complement C5a anaphylatoxin	F1MY85	F1MY85_BOVIN	327	6	188927
	Periostin	D1Z308	D1Z308_BOVIN			93075
	Periostin	G5E6M0	G5E6M0_BOVIN	269	5	93135
	Periostin variant 9	J9QD97	J9QD97_BOVIN			93101
	Periostin variant 8	J9QDG2	J9QDG2_BOVIN			89676

	Cadherin-5	Q6URK6	CADH5_BOVIN	266	6	87413
	Fibrinogen gamma-B	F1MGU7	F1MGU7_BOVIN	160	3	50200
	FGG protein	Q3SZZ9	Q3SZZ9_BOVIN			49136

7	Coagulation factor V	Q28107	FA5_BOVIN	884	15	248828
	Serum albumin	P02769	ALBU_BOVIN	741	13	69248
	Plasma serine protease inhibitor	Q9N2I2	IPSP_BOVIN	686	13	45268
	Antithrombin-III	F1MSZ6	F1MSZ6_BOVIN	556	11	52407
	Complement C3	Q2UVX4	CO3_BOVIN	542	10	187135
	Uncharacterized protein	E1BJK2	E1BJK2_BOVIN	481	10	49955
	Alpha-1-antiproteinase	P34955	A1AT_BOVIN	544	9	46075
	Uncharacterized protein	F2Z4C1	F2Z4C1_BOVIN	510	7	50104
	Tubulin beta-4B chain	Q3MHM5	TBB4B_BOVIN	427	7	49799
	Procollagen C-endopeptidase enhancer	Q2HJB6	Q2HJB6_BOVIN	384	7	48180
	Tubulin alpha-4A chain	P81948	TBA4A_BOVIN	382	6	49892
	Apolipoprotein A-I preproprotein	V6F9A2	V6F9A2_BOVIN	325	5	30258
	Alpha-2-HS-glycoprotein	B0JYN6	B0JYN6_BOVIN	274	5	38394
	Fibrinogen beta chain	F1MAV0	F1MAV0_BOVIN	193	4	56405
	Complement factor B	P81187	CFAB_BOVIN	189	4	85312
	Kininogen-1	F1MNV5	F1MNV5_BOVIN			48391
Kininogen-1	P01044	KNG1_BOVIN	160	3	68847	
Kininogen-2	P01045	KNG2_BOVIN			68666	

8	Component C3	Q2UVX4	CO3_BOVIN	2544	46	187135
	Alpha-1-antiproteinase	P34955	A1AT_BOVIN	886	14	46075
	Complement factor B	P81187	CFAB_BOVIN	707	13	85312
	ALB Protein	B0JYQ0	B0JYQ0_BOVIN	647	12	69248
	Uncharacterized protein	F1MX87	F1MX87_BOVIN			66234
	Complement component 8,	Q2KIH5	Q2KIH5_BOVIN	368	6	66292
	Carboxypeptidase B2	Q2KIG3	CBPB2_BOVIN	335	6	48790
	Inter-alpha-trypsin inhibitor heavy chain H2	F1MNV4	F1MNV4_BOVIN	289	5	106090
	ITIH2 protein	A5D7R6	A5D7R6_BOVIN			
	Alpha-2-HS-glycoprotein	B0JYN6	B0JYN6_BOVIN	265	5	38394
	Alpha-2-HS-glycoprotein	P12763	FETUA_BOVIN			38394
	Uncharacterized protein	F1N102	F1N102_BOVIN	208	4	66614

	Pigment epithelium-derived factor	Q95121	PEDF_BOVIN	936	13	46200
	Serum albumin	P02769	ALBU_BOVIN	770	13	69248
	ALB protein	B0JYQ0	B0JYQ0_BOVIN	745	12	69248

Alpha-enolase	F1MB08	F1MB08_BOVIN			47254
Alpha-enolase	Q9XSJ4	ENOA_BOVIN	726	10	47296
Complement C3	Q2UVX4	CO3_BOVIN			187135
Complement C3	G3X7A5	G3X7A5_BOVIN	525	9	187028
Adenosylhomocysteinase	AHCY		520	11	47607
6-phosphogluconate dehydrogenase, decarboxylating	Q3ZCI4	Q3ZCI4_BOVIN	388	6	53043
Alpha-1-antiproteinase	P34955	A1AT_BOVIN	376	6	46075
Plasma serine protease inhibitor	Q9N2I2	IPSP_BOVIN	353	6	45268
Elongation factor 1-alpha	E1B9F6	E1B9F6_BOVIN			50138
Elongation factor 1-alpha 1	P68103	EF1A1_BOVIN	333	7	50109
Phosphoglycerate kinase 1	Q3T0P6	PGK1_BOVIN	246	5	44509
F10 protein	Q3MHW2	Q3MHW2_BOVIN			53528
Coagulation factor X	P00743	FA10_BOVIN	245	4	54475
Complement factor B	P81187	CFAB_BOVIN	245	7	85312
Uncharacterized protein	F1MDH3	F1MDH3_BOVIN	217	4	270647
Fibrinogen beta chain	F1MAV0	F1MAV0_BOVIN			56405
Fibrinogen beta chain	P02676	FIBB_BOVIN	187	4	53306
Alpha-1-acid glycoprotein	Q3SZR3	A1AG_BOVIN			23168
Alpha-1-acid glycoprotein	Q5GN72	Q5GN72_BOVIN	180	4	23168

10

Complement C3	Q2UVX4	CO3_BOVIN	1420	26	187135
Complement C3	G3X7A5	G3X7A5_BOVIN			187028
Serum albumin	P02769	ALBU_BOVIN	696	13	69248
ALB protein	B0JYQ0	B0JYQ0_BOVIN			69248
Apolipoprotein E	A7YWR0	A7YWR0_BOVIN	634	10	36051
Apolipoprotein E	Q03247	APOE_BOVIN			35958
Fibrinogen beta chain	F1MAV0	F1MAV0_BOVIN	622	10	56405
Apolipoprotein A-I preproprotein	V6F9A2	V6F9A2_BOVIN	611	9	30258
Apolipoprotein A-I	V6F9A2	V6F9A2_BOVIN			30258
Actin, cytoplasmic 1	P60712	ACTB_BOVIN	494	8	41710
Actin, cytoplasmic 2	P63258	ACTG_BOVIN			41766
Clusterin	P17697	CLUS_BOVIN	476	8	51081
Alpha-1-antiproteinase	P34955	A1AT_BOVIN	425	7	46075
Uncharacterized protein	F1N4M7	F1N4M7_BOVIN	335	6	68859
Complement factor I	Q32PI4	Q32PI4_BOVIN			68859
Gelsolin	F1N1I6	F1N1I6_BOVIN	331	7	85634
Pigment epithelium-derived factor	Q95121	PEDF_BOVIN	323	6	46200
Glyceraldehyde-3-phosphate dehydrogenase	P10096	G3P_BOVIN	319	5	35845

	Complement factor B	P81187	CFAB_BOVIN	293	6	85312
	Vitamin K-dependent protein C	P00745	PROC_BOVIN	261	4	51375
	Complement component C7	F1N045	F1N045_BOVIN	201	4	92929
	Complement component C7	Q29RQ1	CO7_BOVIN			92929
	Alpha-fetoprotein	Q3SZ57	FETA_BOVIN	190	4	68543
	Hemoglobin subunit alpha	P01966	HBA_BOVIN	171	4	15175

11	ALB protein	B0JYQ0	B0JYQ0_BOVIN	636	12	69248
	Thrombospondin-1 (Fragment)	Q28194	Q28194_BOVIN	579	11	25000
	Hemoglobin fetal subunit beta	P02081	HBBF_BOVIN	527	7	15849
	Complement C3	Q2UVX4	CO3_BOVIN	454	9	187135
	Alpha-1-antiproteinase	P34955	A1AT_BOVIN	401	6	46075
	Uncharacterized protein	E1BH06	E1BH06_BOVIN	394	6	192644
	Complement C4	P01030	CO4_BOVIN			101820
	L-lactate dehydrogenase	B0JYN3	B0JYN3_BOVIN	352	7	36701
	L-lactate dehydrogenase B	Q5E9B1	LDHB_BOVIN			36700
	Collagen alpha-2(I) chain	P02465	CO1A2_BOVIN	339	5	128985
	Apolipoprotein E (Fragment)	Q0ZCB4	Q0ZCB4_BOVIN	326	5	27057
	Apolipoprotein E	Q03247	APOE_BOVIN			35958
	Coagulation factor V	F1N0I3	F1N0I3_BOVIN	285	6	222078
	Coagulation factor V	Q28107	FA5_BOVIN			248828
	Inter-alpha-trypsin inhibitor heavy chain H3	P56652	ITIH3_BOVIN	250	4	99489
	Protein AMBP	F1MMK9	F1MMK9_BOVIN	244	5	39268
	Uncharacterized protein	E1BMJ0	E1BMJ0_BOVIN	244	5	51679
	Factor XIIa inhibitor	P50448	F12AI_BOVIN			51691
	Hemoglobin subunit alpha	P01966	HBA_BOVIN	235	4	15175
	Pro alpha 1(I) collagen (Fragment)	Q95ND8	Q95ND8_BOVIN	222	4	31678
	Collagen alpha-1(I) chain	P02453	CO1A1_BOVIN			138854
	Tropomyosin beta chain	Q5KR48	TPM2_BOVIN	220	4	32817
	Elongation factor 1-alpha	E1B9F6	E1B9F6_BOVIN			50138
	Elongation factor 1-alpha 1	P68103	EF1A1_BOVIN	196	4	50109
	Alpha-fetoprotein	Q3SZ57	FETA_BOVIN	163	4	68543

	Apolipoprotein A-I preproprotein	V6F9A2	V6F9A2_BOVIN	1400	22	30258
	Apolipoprotein A-I	P15497	APOA1_BOVIN			30258
	ALB protein	B0JYQ0	B0JYQ0_BOVIN	573	9	69248
	Thrombospondin-1 (Fragment)	Q28194	Q28194_BOVIN	465	8	25000

	Alpha-1-antitrypsin	P34955	A1AT_BOVIN	419	6	46075
	Tetranectin	Q2KIS7	TETN_BOVIN	324	4	22130
	Flavin reductase (NADPH)	P52556	BLVRB_BOVIN	278	4	22118
	Hemoglobin fetal subunit beta	P02081	HBBF_BOVIN	244	5	15849
	Gelsolin	F1N1I6	F1N1I6_BOVIN	181	4	85634
	Glutathione S-transferase A2	O18879	GSTA2_BOVIN	179	4	25700

13	ALB protein	B0JYQ0	B0JYQ0_BOVIN	650	10	69248
	Serum albumin	P02769	ALBU_BOVIN	636	22	69248
	Apolipoprotein A-I preproprotein	V6F9A2	V6F9A2_BOVIN	504	7	30258
	Apolipoprotein A-I	P15497	APOA1_BOVIN			30258
	Transgelin-2	Q5E9F5	TAGL2_BOVIN	457	7	22412
	Tetranectin	Q2KIS7	TETN_BOVIN	451	8	22130
	ADP-ribosylation factor 3	Q5E9I6	ARF3_BOVIN	412	8	20588
	ADP-ribosylation factor 1	P84080	ARF1_BOVIN			20684
	Apolipoprotein E	A7YWR0	A7YWR0_BOVIN	394	6	36051
	Apolipoprotein E	Q03247	APOE_BOVIN			35958
	Uncharacterized protein	G3N0S9	G3N0S9_BOVIN	336	5	22321
	Phosphatidylethanolamine-binding protein 1	P13696	PEBP1_BOVIN	310	4	20973
	Hemoglobin fetal subunit beta	P02081	HBBF_BOVIN	292	5	15849
	Fibrinogen alpha chain	A5PJE3	A5PJE3_BOVIN	289	4	66957
	Fibrinogen alpha chain	P02672	FIBA_BOVIN			66971
Alpha-fetoprotein	Q3SZ57	FETA_BOVIN	186	5	68543	

14	Hemoglobin fetal subunit beta	P02081	HBBF_BOVIN	880	12	15849
	Hemoglobin beta	D4QBB4	D4QBB4_BOVIN	670	12	15944
	Hemoglobin subunit beta	P02070	HBB_BOVIN			15944
	Hemoglobin beta	D4QBB3	D4QBB3_BOVIN	646	8	15969
	Hemoglobin subunit alpha	P01966	HBA_BOVIN	398	6	15175
	Profilin-1	P02584	PROF1_BOVIN	368	5	15048
	Apolipoprotein E (Fragment)	Q0ZCB4	Q0ZCB4_BOVIN	268	5	27057
	Apolipoprotein E	Q03247	APOE_BOVIN			35958