



Figure S1 Schematic representation of a procedure for organs and serum collection and protein separation by a magnetic reactor.

For more information about the magnetic reactor:

B. Steitz, J. Salaklang, A. Finka, C. O'Neil, H. Hofmann and A. Petri-Fink, *Bioconjugate Chem.*, 2007, 18(5), 1684.

J. Salaklang, Thèse Ecole polytechnique fédérale de Lausanne EPFL, no 4539 (2009), Programme doctoral Sciences et Génie des matériaux, Faculté des sciences et techniques de l'ingénieur STI, Institut des matériaux IMX (Laboratoire de technologie des poudres LTP) Dir Heinrich Hofmann, Alke Susanne Fink, EPFL, 2009

Table S1 List of all prominent proteins identified in the hard corona associated with positively charged SPIONs *in vivo*.

Accession	Mass (Da)	Description	-10lgP		# Spectra		NpSpC		Average NpSpC	SD (±)
			Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2		
P04937 FINC_RAT	272509	Fibronectin	141.63	148.47	7	6	0.77	0.65	0.71	0.09
P01026 CO3_RAT	186459	Complement C3	323.59	374.3	34	34	5.47	5.38	5.43	0.06
Q63041 A1M_RAT	167124	Alpha-1-macroglobulin	77.99	87.56	2	2	0.36	0.35	0.36	0.00
Q03626 MUG1_RAT	165325	Murinoglobulin-1	56.53	62.56	1	1	0.18	0.18	0.18	0.00
P14046 A1I3_RAT	163772	Alpha-1-inhibitor 3	56.53	62.56	1	1	0.18	0.18	0.18	0.00
Q6IE52 MUG2_RAT	161588	Murinoglobulin-2	56.53	62.56	1	1	0.19	0.18	0.18	0.00
P23562 B3AT_RAT	103173	Band 3 anion transport protein	51.21	48.25	2	2	0.58	0.57	0.58	0.01
P06399 FIBA_RAT	86686	Fibrinogen alpha chain	247.12	275.51	23	23	7.96	7.83	7.90	0.09

P84903 STIM1_RAT	77449	Stromal interaction molecule 1	ND	26.56	0	1	0.00	0.38	0.19	0.27
P02770 ALBU_RAT	68731	Serum albumin	132.21	139.59	6	5	2.62	2.15	2.38	0.33
Q62894 ECM1_RAT	63249	Extracellular matrix protein 1	51.59	59.36	1	1	0.47	0.47	0.47	0.01
Q62930 CO9_RAT	62281	Complement component C9	69.78	74.88	1	1	0.48	0.47	0.48	0.01
P82450 SIAE_RAT	60466	Sialate O-acetyltransferase	33.11	34.09	1	1	0.50	0.49	0.49	0.01
Q9EPH1 A1BG_RAT	56479	Alpha-1B-glycoprotein	34.87	40.27	1	1	0.53	0.52	0.53	0.01
Q63207 FA10_RAT	54265	Coagulation factor X	107.53	125.53	4	4	2.21	2.18	2.19	0.03
P14480 FIBB_RAT	54235	Fibrinogen beta chain	163.66	186.87	5	5	2.77	2.72	2.74	0.03
P02680 FIBG_RAT	50633	Fibrinogen gamma chain	102.39	99.37	3	3	1.78	1.75	1.76	0.02

Q8K3U6 FA7_RAT	50399	Coagulation factor VII	49.75	64.63	1	1	0.60	0.59	0.59	0.01
Q66H16 FSIP1_RAT	49568	Fibrous sheath-interacting protein 1	ND	22.71	0	1	0.00	0.60	0.30	0.42
Q64536 PDK2_RAT	46106	[Pyruvate dehydrogenase [lipoamide]] kinase isozyme 2_mitochondrial	ND	23.2	0	1	0.00	0.64	0.32	0.45
Q4FZT0 STML2_RAT	38414	Stomatin-like protein 2	ND	24.79	0	1	0.00	0.77	0.38	0.54
P24090 FETUA_RAT	37982	Alpha-2-HS-glycoprotein	105.49	119.12	2	2	1.58	1.55	1.57	0.02
P04797 G3P_RAT	35828	Glyceraldehyde-3-phosphate dehydrogenase	33.45	ND	1	0	0.84	0.00	0.42	0.59
P02650 APOE_RAT	35753	Apolipoprotein E	216.06	239.61	12	12	10.07	9.91	9.99	0.12
P08721 OSTP_RAT	34963	Osteopontin	83.88	85.73	2	2	1.72	1.69	1.70	0.02
P04639 APOA1_RAT	30062	Apolipoprotein A-I	60.41	76.14	1	1	1.00	0.98	0.99	0.01

P00762 TRY1_RAT	25959	Anionic trypsin-1	47.18	56.69	1	1	1.16	1.14	1.15	0.01
Q62740 SPP24_RAT	23170	Secreted phosphoprotein 24	116.62	129.96	6	5	7.77	6.37	7.07	0.99
P11517 HBB2_RAT	15982	Hemoglobin subunit beta-2	204.32	237.69	9	9	16.90	16.62	16.76	0.20
P02091 HBB1_RAT	15979	Hemoglobin subunit beta-1	171.83	192.93	7	7	13.15	12.93	13.04	0.16
P01946 HBA_RAT	15329	Hemoglobin subunit alpha-1/2	156.64	176.93	8	9	15.66	17.33	16.50	1.18
P08494 MGP_RAT	12037	Matrix Gla protein	70.71	78.45	1	1	2.49	2.45	2.47	0.03

Table S2 List of all prominent proteins identified in the hard corona associated with neutral SPIONs *in vivo*.

Accession	Mass (Da)	Protein	-10lgP		# Spectra		NpSpC		Average NpSpC	SD (±)
			Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2		
P04937 FINC_RAT	272509	Fibronectin	307.38	252.2	24	24	1.50	1.75	1.63	0.18
Q9R095 SPEF2_RAT	208157	Sperm flagellar protein 2	30.25	#N/A	1	0	0.08	0.00	0.04	0.06
P08649 CO4_RAT	192162	Complement C4	38.59	#N/A	1	0	0.09	0.00	0.04	0.06
Q00918 LTBP1_RAT	186598	Latent-transforming growth factor beta-binding protein 1	69.95	#N/A	1	0	0.09	0.00	0.05	0.06
P01026 CO3_RAT	186459	Complement C3	265.45	221.71	26	27	2.37	2.88	2.63	0.36
Q63041 A1M_RAT	167124	Alpha-1-macroglobulin	185.78	151.2	8	7	0.82	0.83	0.82	0.01
Q03626 MUG1_RAT	165325	Murinoglobulin-1	65.65	#N/A	1	0	0.10	0.00	0.05	0.07
P14046 A1I3_RAT	163772	Alpha-1-inhibitor 3	65.65	#N/A	1	0	0.10	0.00	0.05	0.07

Q6IE52 MUG2_RAT	161588	Murinoglobulin-2	65.65	#N/A	1	0	0.11	0.00	0.05	0.07
P10686 PLCG1_RAT	148548	1-phosphatidylinositol 4_5-bisphosphate phosphodiesterase gamma-1	33.81	#N/A	1	0	0.11	0.00	0.06	0.08
P24135 PLCG2_RAT	147735	1-phosphatidylinositol 4_5-bisphosphate phosphodiesterase gamma-2	33.81	#N/A	1	0	0.12	0.00	0.06	0.08
Q63273 GRIK5_RAT	109276	Glutamate receptor_ ionotropickainate 5	30.25	#N/A	1	0	0.16	0.00	0.08	0.11
Q01812 GRIK4_RAT	107223	Glutamate receptor_ ionotropickainate 4	30.25	#N/A	1	0	0.16	0.00	0.08	0.11
Q498T9 LRC8C_RAT	92463	Leucine-rich repeat-containing protein 8C	30.25	#N/A	1	0	0.18	0.00	0.09	0.13
Q4G061 EIF3B_RAT	90911	Eukaryotic translation initiation factor 3 subunit B	30.25	#N/A	1	0	0.19	0.00	0.09	0.13
P06399 FIBA_RAT	86686	Fibrinogen alpha chain	322.64	254.78	43	42	8.45	9.65	9.05	0.85
O08619 F13A_RAT	82659	Coagulation factor XIII A chain	211.75	179.93	8	8	1.65	1.93	1.79	0.20

O35314 SCG1_RAT	77536	Secretogranin-1	57.83	#N/A	1	0	0.22	0.00	0.11	0.16
P12346 TRFE_RAT	76395	Serotransferrin	85.53	70.98	2	2	0.45	0.52	0.48	0.05
P53813 PROS_RAT	74627	Vitamin K-dependent protein S	104.7	88.76	2	3	0.46	0.80	0.63	0.24
P08934 KNG1_RAT	70933	Kininogen-1	37.56	#N/A	1	0	0.24	0.00	0.12	0.17
P18292 THRB_RAT	70412	Prothrombin	118.88	99.03	4	3	0.97	0.85	0.91	0.08
D3ZC96 TT39B_RAT	70168	Tetratricopeptide repeat protein 39B	30.25	#N/A	1	0	0.24	0.00	0.12	0.17
P02770 ALBU_RAT	68731	Serum albumin	138.09	112	4	4	0.99	1.16	1.08	0.12
Q61MF3 K2C1_RAT	64831	Keratin_type II cytoskeletal 1	85.04	#N/A	1	0	0.26	0.00	0.13	0.19
Q62894 ECM1_RAT	63249	Extracellular matrix protein 1	118.93	108.57	4	4	1.08	1.26	1.17	0.13
Q62930 CO9_RAT	62281	Complement component C9	100	84.03	2	2	0.55	0.64	0.59	0.07

Q6IG03 K2C73_RAT	60387	Keratin_type II cytoskeletal 73	85.04	#N/A	1	0	0.28	0.00	0.14	0.20
Q6IG01 K2C1B_RAT	57255	Keratin_type II cytoskeletal 1b	85.04	#N/A	1	0	0.30	0.00	0.15	0.21
Q9EPH1 A1BG_RAT	56479	Alpha-1B-glycoprotein	112.61	96.22	4	3	1.21	1.06	1.13	0.10
Q63207 FA10_RAT	54265	Coagulation factor X	197.32	163.31	12	13	3.77	4.77	4.27	0.71
P14480 FIBB_RAT	54235	Fibrinogen beta chain	322.28	252.69	26	26	8.16	9.55	8.86	0.98
P05371 CLUS_RAT	51375	Clusterin	201.69	164.38	8	8	2.65	3.10	2.88	0.32
P02680 FIBG_RAT	50633	Fibrinogen gamma chain	243.88	205.16	20	20	6.73	7.87	7.30	0.81
Q8K3U6 FA7_RAT	50399	Coagulation factor VII	145.92	121.76	5	5	1.69	1.98	1.83	0.20
P08932 KNT2_RAT	47704	T-kininogen 2	37.56	#N/A	1	0	0.36	0.00	0.18	0.25
P02651 APOA4_RAT	44456	Apolipoprotein A-IV	137.1	116.74	4	4	1.53	1.79	1.66	0.18

Q9QUH3 APOA5_RAT	41427	Apolipoprotein A-V	42.65	#N/A	1	0	0.41	0.00	0.21	0.29
Q5BJX5 F110B_RAT	40363	Protein FAM110B	30.25	#N/A	1	0	0.42	0.00	0.21	0.30
P24090 FETUA_RAT	37982	Alpha-2-HS-glycoprotein	135.05	108.1	4	4	1.79	2.10	1.95	0.22
Q9WTS8 FCN1_RAT	36627	Ficolin-1	186.46	154.53	5	5	2.32	2.72	2.52	0.28
P04797 G3P_RAT	35828	Glyceraldehyde-3-phosphate dehydrogenase	45.8	#N/A	1	0	0.48	0.00	0.24	0.34
P02650 APOE_RAT	35753	Apolipoprotein E	215.61	177.16	8	8	3.81	4.46	4.13	0.46
P08721 OSTP_RAT	34963	Osteopontin	126.86	120.91	6	6	2.92	3.42	3.17	0.35
P16296 FA9_RAT	31447	Coagulation factor IX (Fragment)	106.95	#N/A	2	0	1.08	0.00	0.54	0.77
Q09167 SRSF5_RAT	30891	Serine/arginine-rich splicing factor 5	75.11	#N/A	2	0	1.10	0.00	0.55	0.78
P04639 APOA1_RAT	30062	Apolipoprotein A-I	174.19	153.68	7	7	3.96	4.64	4.30	0.48

Q6PDU1 SRSF2_RAT	25476	Serine/arginine-rich splicing factor 2	43.68	#N/A	1	0	0.67	0.00	0.33	0.47
P48032 TIMP3_RAT	24226	Metalloproteinase inhibitor 3	32.88	#N/A	1	0	0.70	0.00	0.35	0.50
Q62740 SPP24_RAT	23170	Secreted phosphoprotein 24	184.02	153.51	7	6	5.14	5.16	5.15	0.01
P11517 HBB2_RAT	15982	Hemoglobin subunit beta-2	192.54	#N/A	5	0	5.33	0.00	2.66	3.77
P02091 HBB1_RAT	15979	Hemoglobin subunit beta-1	234.1	185.57	6	6	6.39	7.48	6.94	0.77
P01946 HBA_RAT	15329	Hemoglobin subunit alpha-1/2	143.29	119.8	7	7	7.78	9.10	8.44	0.93
P08494 MGP_RAT	12037	Matrix Gla protein	108.16	97.78	2	2	2.83	3.31	3.07	0.34
P04638 APOA2_RAT	11439	Apolipoprotein A-II	139.01	113.14	3	3	4.47	5.22	4.85	0.53

Table S3 List of all prominent proteins identified in the hard corona associated with negatively charged SPIONs *in vivo*.

Accession	Mass (Da)	Protein	-10lgP		# Spectra		NpSpC		Average NpSpC	SD (±)
			Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2		
P04937 FINC_RAT	272509	Fibronectin	130.56	146.56	8	7	0.60	0.52	0.56	0.05
Q62812 MYH9_RAT	226336	Myosin-9	65.71	60.28	2	2	0.18	0.18	0.18	0.00
P08649 CO4_RAT	192162	Complement C4	120.74	128.96	3	4	0.32	0.43	0.37	0.08
P01026 CO3_RAT	186459	Complement C3	212.68	230.14	15	16	1.64	1.75	1.70	0.08
Q63041 A1M_RAT	167124	Alpha-1-macroglobulin	69.67	68.86	2	1	0.24	0.12	0.18	0.09
Q03626 MUG1_RAT	165325	Murinoglobulin-1	70.89	76.66	2	2	0.25	0.25	0.25	0.00
P14046 A1I3_RAT	163772	Alpha-1-inhibitor 3	70.89	76.66	2	2	0.25	0.25	0.25	0.00
Q61E52 MUG2_RAT	161588	Murinoglobulin-2	70.89	76.66	2	2	0.25	0.25	0.25	0.00

Q63416 ITIH3_RAT	99098	Inter-alpha-trypsin inhibitor heavy chain H3	31.04	35.01	1	1	0.21	0.21	0.21	0.00
Q9R0T4 CADH1_RAT	98715	Cadherin-1	58.01	52.03	2	2	0.41	0.41	0.41	0.00
P06399 FIBA_RAT	86686	Fibrinogen alpha chain	202.83	204.36	18	18	4.24	4.24	4.24	0.00
Q63772 GAS6_RAT	74638	Growth arrest-specific protein 6	111.18	110.61	3	3	0.82	0.82	0.82	0.00
P53813 PROS_RAT	74627	Vitamin K-dependent protein S	106.09	109.62	3	3	0.82	0.82	0.82	0.00
P18292 THRB_RAT	70412	Prothrombin	56.88	61.37	1	1	0.29	0.29	0.29	0.00
P02770 ALBU_RAT	68731	Serum albumin	150.42	171.2	6	6	1.78	1.78	1.78	0.00
Q62894 ECM1_RAT	63249	Extracellular matrix protein 1	44.81	44.49	1	1	0.32	0.32	0.32	0.00
Q62930 CO9_RAT	62281	Complement component C9	103.72	105.21	2	2	0.66	0.66	0.66	0.00
Q71RP1 HPSE_RAT	60480	Heparanase	136.75	144.71	5	5	1.69	1.69	1.69	0.00

P82450 SIAE_RAT	60466	Sialate O-acetyltransferase	37.88	42.09	1	1	0.34	0.34	0.34	0.00
Q9EPH1 A1BG_RAT	56479	Alpha-1B-glycoprotein	92	93.17	4	3	1.45	1.09	1.27	0.26
P07867 LIPC_RAT	55623	Hepatic triacylglycerol lipase	72.21	69.21	3	2	1.10	0.73	0.92	0.26
Q68FR2 BIN2_RAT	55118	Bridging integrator 2	62.98	71.28	1	1	0.37	0.37	0.37	0.00
Q63207 FA10_RAT	54265	Coagulation factor X	218.7	221.42	15	15	5.65	5.65	5.65	0.00
P14480 FIBB_RAT	54235	Fibrinogen beta chain	153.31	162.31	6	6	2.26	2.26	2.26	0.00
Q63313 LBP_RAT	53600	Lipopolysaccharide-binding protein	ND	58.71	0	2	0.00	0.76	0.38	0.54
Q06000 LIPL_RAT	53082	Lipoprotein lipase	ND	44.66	0	2	0.00	0.77	0.38	0.54
P31394 PROC_RAT	51912	Vitamin K-dependent protein C	62.69	65.43	1	1	0.39	0.39	0.39	0.00
P02680 FIBG_RAT	50633	Fibrinogen gamma chain	137.15	143.4	5	5	2.02	2.02	2.02	0.00

Q8K3U6 FA7_RAT	50399	Coagulation factor VII	111.45	119.2	4	4	1.62	1.62	1.62	0.00
Q9R0I8 PI42A_RAT	46210	Phosphatidylinositol 5-phosphate 4-kinase type-2 alpha	69.79	74.68	1	1	0.44	0.44	0.44	0.00
P02651 APOA4_RAT	44456	Apolipoprotein A-IV	37.76	35.02	1	1	0.46	0.46	0.46	0.00
P24090 FETUA_RAT	37982	Alpha-2-HS-glycoprotein	128.83	134.85	2	2	1.08	1.08	1.08	0.00
Q9WTS8 FCN1_RAT	36627	Ficolin-1	199.66	204.3	9	9	5.02	5.02	5.02	0.00
P04797 G3P_RAT	35828	Glyceraldehyde-3-phosphate dehydrogenase	122.73	125.71	7	7	3.99	3.99	3.99	0.00
P02650 APOE_RAT	35753	Apolipoprotein E	182.71	194.95	10	10	5.72	5.72	5.72	0.00
P08721 OSTP_RAT	34963	Osteopontin	74.84	74.38	2	2	1.17	1.17	1.17	0.00
P57756 FCN2_RAT	34684	Ficolin-2	30.87	33.52	1	1	0.59	0.59	0.59	0.00
P16296 FA9_RAT	31447	Coagulation factor IX (Fragment)	117.58	115.43	3	3	1.95	1.95	1.95	0.00

Q09167 SRSF5_RAT	30891	Serine/arginine-rich splicing factor 5	58.77	66.1	1	1	0.66	0.66	0.66	0.00
P24594 IBP5_RAT	30298	Insulin-like growth factor-binding protein 5	32.89	36.87	1	1	0.67	0.67	0.67	0.00
P04639 APOA1_RAT	30062	Apolipoprotein A-I	86.9	79.94	2	2	1.36	1.36	1.36	0.00
P23680 SAMP_RAT	26176	Serum amyloid P-component	31.66	ND	1	0	0.78	0.00	0.39	0.55
P00762 TRY1_RAT	25959	Anionic trypsin-1	40.92	41.73	1	1	0.79	0.79	0.79	0.00
P48199 CRP_RAT	25468	C-reactive protein	44.39	58.64	1	1	0.80	0.80	0.80	0.00
P48032 TIMP3_RAT	24226	Metalloproteinase inhibitor 3	104.52	108.27	3	3	2.53	2.53	2.53	0.00
Q62740 SPP24_RAT	23170	Secreted phosphoprotein 24	149.77	160.3	5	5	4.41	4.41	4.41	0.00
P11517 HBB2_RAT	15982	Hemoglobin subunit beta-2	193.09	198.74	8	8	10.23	10.23	10.23	0.00
P02091 HBB1_RAT	15979	Hemoglobin subunit beta-1	221.75	228.01	7	7	8.96	8.95	8.95	0.00

P01946 HBA_RAT	15329	Hemoglobin subunit alpha-1/2	149.41	169.86	7	7	9.33	9.33	9.33	0.00
P08494 MGP_RAT	12037	Matrix Gla protein	74.53	82.87	1	1	1.70	1.70	1.70	0.00
P04638 APOA2_RAT	11439	Apolipoprotein A-II	124.7	126.94	4	4	7.15	7.15	7.15	0.00