Electronic Supplementary Material (ESI) for Analyst.
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pH-based sensor array for the detection and identification of proteins using CdSe/ZnS quantum dots as indicator

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Results

			Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV):	-10.1	**Peak 1:**	-9.19	96.9	9.70
Zeta Deviation (mV):	22.4	**Peak 2:**	24.5	2.1	4.41
Conductivity (mS/cm):	0.00414	**Peak 3:**	69.4	0.5	1.35

Result quality See result quality report

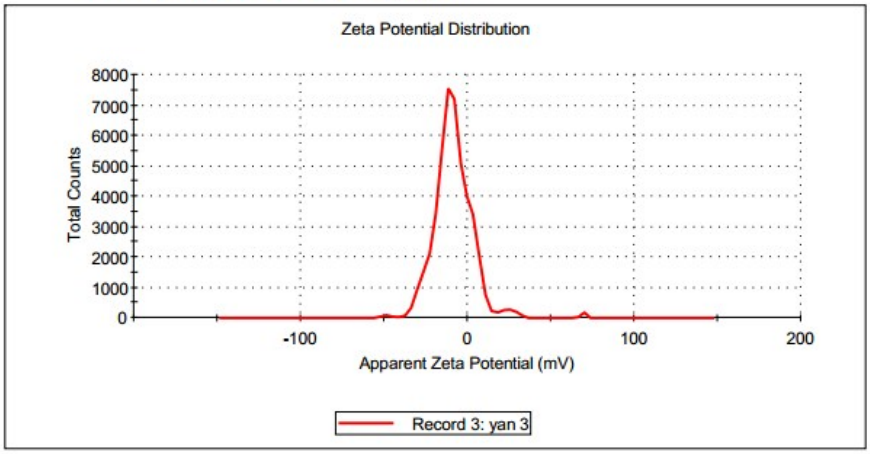

Figure S1. Zeta potential of QDs@MPA

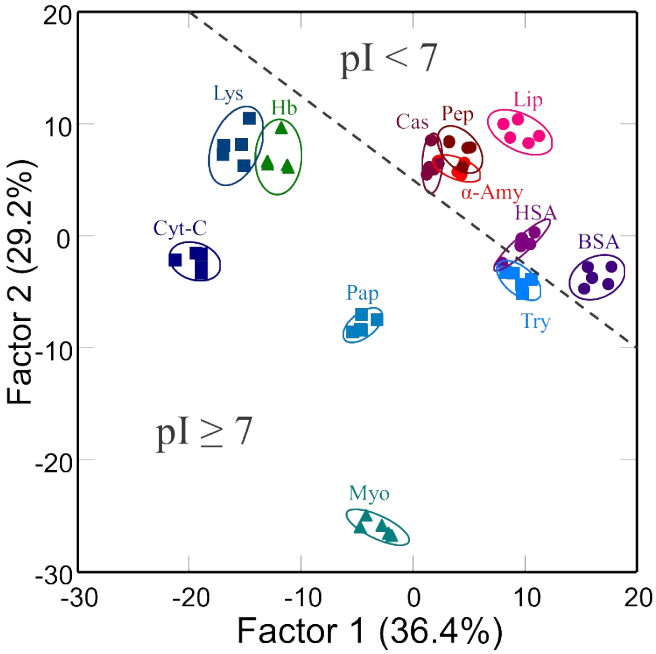

Figure S2. 2D canonical score plot for the response patterns as obtained from LDA with 95% confidence ellipses. Each point represents the response pattern for a single protein (5 μM) against the sensor array.

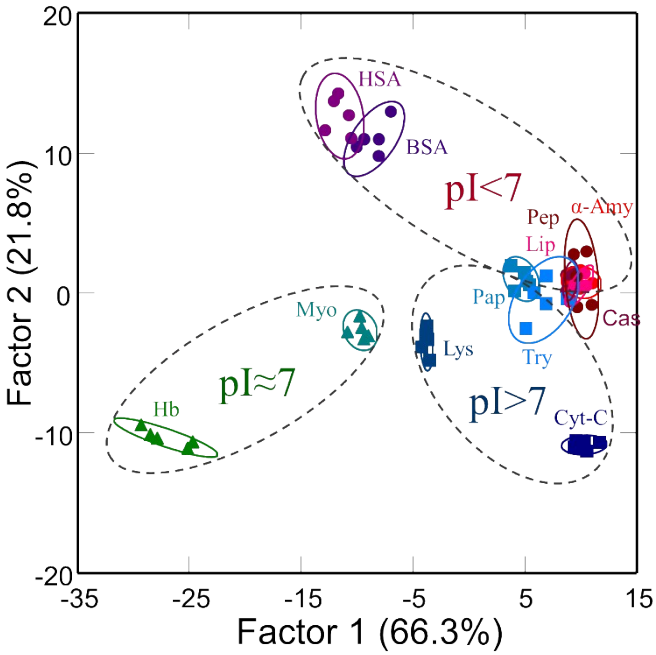

Figure S3. 2D canonical score plot for the response patterns as obtained from LDA with 95% confidence ellipses. Each point represents the response pattern for a single protein (0.1 μM) against the sensor array.

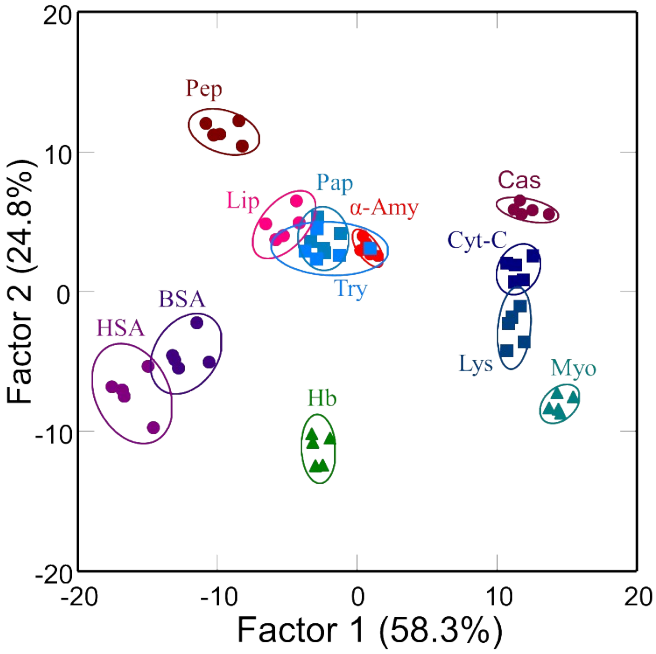

Figure S4. 2D canonical score plot for the response patterns (QDs@PEG) as obtained from LDA with 95% confidence ellipses response patterns. Each point represents the response pattern for a single protein (5 μM) against the sensor array.

The comparison of three amino acids and three proteins with similar pI

Amino acids included acidic amino acid-aspartic acid (Asp, pI = 2.8), neutral amino acid-cysteine (Cys, pI = 5.1), and basic amino acid-arginine (Arg, pI = 10.8) respectively. Proteins are pepsase (Pep, pI = 2.5), human serum albumin (HSA, pI = 5.2), and cytochrome C (Cyt-C, pI = 10.8) whose pI is similar to amino acid's pI. As illustrated in the Fig.S2, there is no significant fluorescence changes in amino acids group, while proteins group has significant changes especially Cyt-C and HSA. The fluorescence change in amino acids group is much smaller than that in protein group with the same concentration (5 μM). The result showed that our sensor array could differentiate the amino acid from any protein with similar pI.

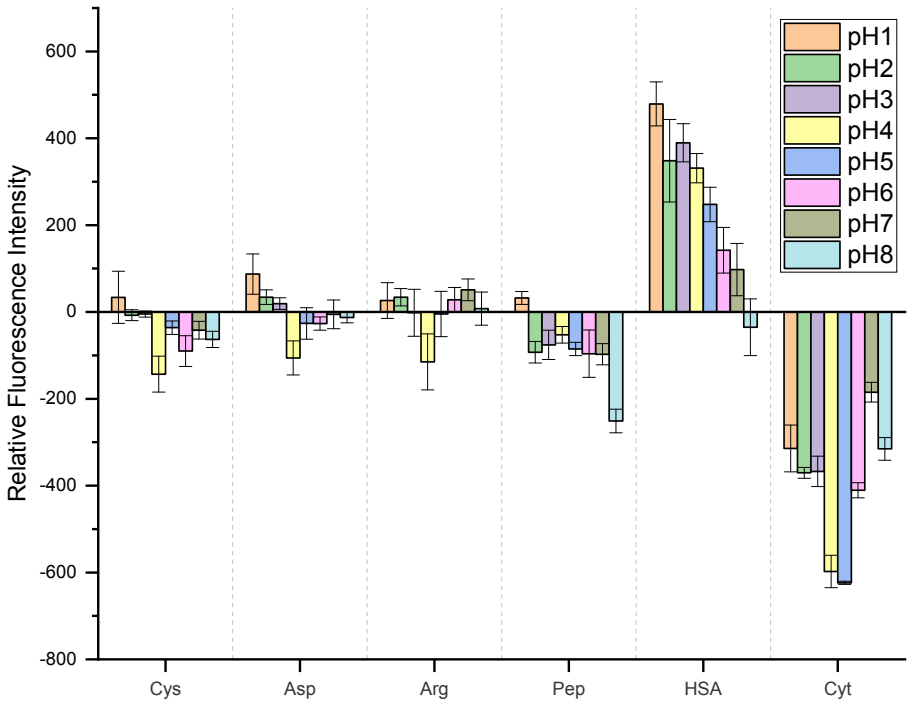

Figure S5. Fluorescence response patterns obtained by eight different pH solutions with QDs@MPA treated with amino acids and proteins in water (5 μM), respectively. Each value is the average of three independent measurements and each error bar shows the standard deviation (SD) of these measurements.

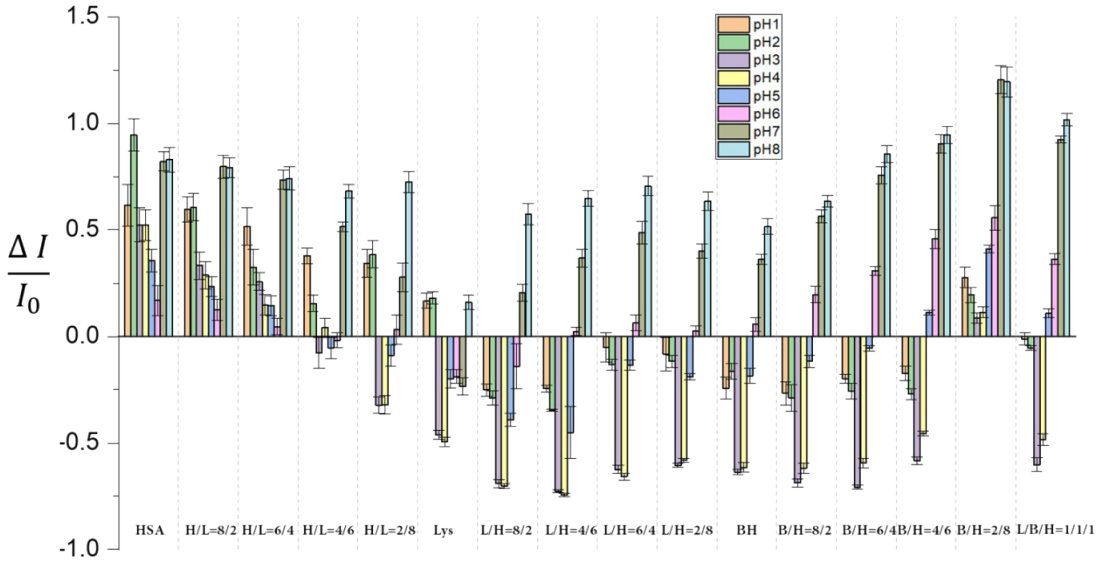

Figure S6. Fluorescence response pattern $\Delta I/I_0$ obtained by protein mixtures of HSA, Hb and Lys with different ratios (the total protein concentration was 0.5 μM). Each value is the average of five independent measurements; each error bar shows the standard deviation (SD) of these measurements.

Table S1. Eight pH buffer solutions as sensing elements

No.	Buffer system	c (mol/L)	pH
1	NaAc/HAc	0.2	4.6
2	NaAc/HAc	0.2	5.3
3	Na_2HPO_4/NaH_2PO_4	0.05	6.3
4	Na_2HPO_4/NaH_2PO_4	0.05	6.9
5	Tris/HCl	0.1	8.0
6	Tris/HCl	0.1	9.0
7	$Na_2CO_3/NaHCO_3$	0.1	9.7
8	$Na_2CO_3/NaHCO_3$	0.1	10.4

(Note: pH measurements at 25 degrees Celsius)

Table S2. Physical Properties of Proteins

No.	Protein	pI	MW(kDa)	Metal
1	Pepsin (Pep) 1:3000	2.5	35	N
2	Casein (Cas)	4.6	24	N
3	Bovine Serum Albumin (BSA)	4.8	66.4	N
4	α-Amylase (α-Amy)	5.0	55.4	Y
5	Human Serum Albumin (HSA)	5.2	69.4	N
6	Lipase (Lip)	5.6	58	N
7	Bovine Hemoglobin (Hb)	6.8	64.5	Y
8	Myoglobin (Myo)	7.2	17	Y
9	Papain (Pap)	9.6	23	N
10	Trypsin (Try) 1:250	10.5	24	N
11	Cytochrome C (Cyt-C)	10.8	12	Y
12	Lysozyme (Lys)	11.0	14.4	N

Table S3. Training matrix of fluorescence response pattern obtained from a sensor array against 12 protein (0.5μM) in distilled (DI) water.

Analytes	Florescence Response Pattern							
Protein	E1	E2	E3	E4	E5	E6	E7	E8
Pep	-0.313	-0.239	-0.153	-0.045	-0.266	-0.282	0.016	-0.032
Pep	-0.311	-0.176	-0.086	0.041	-0.210	-0.222	0.082	0.082
Pep	-0.229	-0.099	-0.027	0.051	-0.190	-0.240	0.073	0.093
Pep	-0.271	-0.115	0.130	0.110	-0.138	-0.179	0.078	0.088
Pep	-0.239	-0.168	0.187	0.107	-0.154	-0.191	0.055	0.053
Cas	0.439	0.863	1.067	0.300	-0.027	-0.145	-0.069	0.003
Cas	0.414	0.787	1.026	0.285	0.010	-0.122	-0.049	-0.045
Cas	0.538	0.625	1.080	0.304	0.001	-0.126	-0.034	0.022
Cas	0.582	0.790	1.096	0.280	0.036	-0.138	-0.035	-0.038
Cas	0.534	0.812	1.025	0.189	-0.092	-0.156	-0.080	-0.026
BSA	0.022	0.134	0.759	0.424	-0.116	-0.169	0.407	0.434
BSA	0.090	0.252	0.885	0.438	-0.029	-0.075	0.540	0.490
BSA	0.130	0.084	0.738	0.530	-0.030	-0.112	0.478	0.518
BSA	0.150	0.176	0.882	0.566	0.019	-0.024	0.612	0.604
BSA	0.199	0.197	0.877	0.593	0.029	-0.033	0.604	0.537
α-Amy	-0.260	-0.117	0.131	0.183	-0.068	-0.111	0.216	0.280
α-Amy	-0.256	-0.115	0.193	0.041	-0.026	-0.103	0.222	0.324
α-Amy	-0.234	-0.131	0.132	0.198	0.004	-0.083	0.289	0.284
α-Amy	-0.231	-0.130	0.234	0.286	-0.020	-0.089	0.314	0.268
α-Amy	-0.197	-0.082	0.149	0.179	-0.045	-0.120	0.247	0.276
HSA	0.219	0.642	1.181	0.495	-0.007	-0.124	0.492	0.463
HSA	0.365	0.826	1.390	0.645	0.002	-0.047	0.575	0.560
HSA	0.387	0.678	1.273	0.654	0.010	-0.018	0.666	0.583
HSA	0.371	0.798	1.380	0.667	0.080	-0.044	0.659	0.636
HSA	0.355	0.711	1.202	0.604	0.073	-0.033	0.625	0.551
Lip	-0.104	0.025	0.174	0.077	-0.009	0.007	0.103	0.116
Lip	-0.108	0.052	0.162	0.119	-0.013	-0.011	0.121	0.111
Lip	-0.097	0.048	0.124	0.084	0.008	0.005	0.103	0.132
Lip	-0.123	-0.024	0.136	0.100	-0.034	-0.004	0.081	0.062
Lip	-0.126	-0.044	0.022	0.037	-0.065	-0.056	0.030	0.123
Hb	0.014	0.039	-0.395	-0.392	0.235	0.167	0.530	0.480
Hb	0.086	0.169	-0.278	-0.355	0.291	0.248	0.697	0.593
Hb	0.079	0.025	-0.402	-0.379	0.205	0.220	0.691	0.620
Hb	0.058	0.017	-0.359	-0.368	0.281	0.256	0.709	0.648
Hb	0.097	-0.016	-0.387	-0.375	0.219	0.287	0.728	0.608
Myo	0.018	-0.022	-0.351	-0.437	0.022	0.207	0.397	0.486
Myo	0.017	0.008	-0.358	-0.415	0.066	0.248	0.440	0.467
Myo	-0.002	-0.074	-0.343	-0.390	0.074	0.226	0.455	0.477
Myo	-0.001	-0.086	-0.363	-0.454	0.009	0.174	0.369	0.364

Myo	-0.047	-0.073	-0.350	-0.455	0.003	0.158	0.361	0.414
Pap	-0.216	-0.158	-0.225	-0.125	0.103	0.042	0.226	0.175
Pap	-0.176	-0.046	-0.086	-0.010	0.232	0.122	0.320	0.227
Pap	-0.144	-0.072	-0.027	-0.033	0.154	0.128	0.406	0.223
Pap	-0.180	-0.094	-0.070	-0.110	0.162	0.113	0.324	0.266
Pap	-0.134	-0.055	-0.081	-0.005	0.202	0.158	0.347	0.100
Try	-0.199	0.004	0.007	0.082	0.044	0.061	0.367	0.224
Try	-0.210	-0.138	0.004	-0.001	0.033	0.118	0.328	0.213
Try	-0.223	-0.118	-0.083	0.011	0.019	0.059	0.292	0.253
Try	-0.246	-0.184	-0.076	0.038	-0.016	0.045	0.233	0.246
Try	-0.250	-0.163	-0.085	-0.014	-0.027	-0.021	0.169	0.208
Cyt-C	-0.316	-0.258	-0.506	-0.672	-0.541	-0.481	-0.468	-0.397
Cyt-C	-0.218	-0.278	-0.498	-0.675	-0.483	-0.436	-0.429	-0.357
Cyt-C	-0.208	-0.211	-0.497	-0.634	-0.456	-0.444	-0.395	-0.336
Cyt-C	-0.189	-0.231	-0.477	-0.682	-0.518	-0.425	-0.411	-0.327
Cyt-C	-0.197	-0.260	-0.508	-0.660	-0.491	-0.417	-0.419	-0.354
Lys	-0.158	-0.202	-0.480	-0.650	-0.317	-0.254	-0.357	-0.149
Lys	-0.157	-0.183	-0.487	-0.631	-0.245	-0.316	-0.306	-0.208
Lys	-0.180	-0.232	-0.479	-0.627	-0.210	-0.266	-0.315	-0.166
Lys	-0.163	-0.200	-0.458	-0.606	-0.285	-0.343	-0.326	-0.227
Lys	-0.194	-0.237	-0.497	-0.619	-0.265	-0.372	-0.289	-0.309

Table S4. LDA was carried out and resulting in 8 scores (12 protein at 0.5μM).

Analytes	Results LDA							
Protein	Score1	Score2	Score3	Score4	Score5	Score6	Score7	Score8
Pep	0.966	-3.435	-8.545	3.290	0.108	-1.445	-0.075	1.883
Pep	1.270	-5.671	-7.935	1.789	-0.445	-1.459	-1.447	1.457
Pep	2.815	-3.786	-6.163	1.948	0.479	-1.057	-2.091	1.799
Pep	3.492	-4.774	-7.672	-0.388	0.188	-0.608	-0.342	-0.452
Pep	4.690	-3.782	-8.046	0.115	0.382	0.645	1.081	-0.687
Cas	20.827	16.798	4.743	-6.106	-0.445	-1.349	-1.747	-0.227
Cas	18.846	16.575	3.967	-6.739	0.417	-1.163	-0.174	-0.194
Cas	20.661	16.873	4.715	-4.852	1.151	3.503	1.052	0.380
Cas	20.605	19.617	6.675	-5.468	2.123	1.210	0.671	0.929
Cas	20.366	19.682	6.331	-3.742	-1.281	0.038	-0.178	0.509
BSA	16.638	-10.358	-1.337	4.946	0.044	1.368	0.419	-0.618
BSA	15.848	-10.513	1.470	4.122	-0.060	0.399	1.970	-1.355
BSA	16.175	-10.735	-0.364	3.480	1.121	3.942	-0.455	1.627
BSA	16.236	-12.737	1.338	3.154	-0.048	2.925	0.893	0.356
BSA	16.694	-10.869	1.362	2.586	0.524	2.727	1.315	1.865
α-Amy	2.452	-9.101	-6.135	-0.437	0.205	0.227	-1.901	-0.402
α-Amy	1.016	-8.494	-3.585	0.982	1.709	0.923	-0.570	-3.711
α-Amy	1.208	-9.635	-5.207	-0.688	1.832	0.343	-0.869	0.000

α-Amy	3.842	-10.721	-6.388	-0.550	1.190	0.197	0.063	0.352
α-Amy	2.804	-8.104	-4.585	0.238	1.273	0.269	-1.550	0.269
HSA	22.074	-5.713	5.155	3.288	0.524	-2.418	0.292	-2.208
HSA	25.994	-5.017	7.122	1.875	-2.167	-2.399	-0.470	-1.030
HSA	23.785	-6.843	6.878	2.948	-1.945	-1.012	0.736	0.964
HSA	25.117	-7.372	8.408	2.512	0.264	-1.822	-0.720	-1.092
HSA	21.693	-5.731	7.431	1.795	0.191	-1.770	-0.237	0.436
Lip	-0.308	0.837	-4.201	-5.538	-1.442	0.402	0.021	-0.383
Lip	0.388	0.186	-4.421	-5.373	-1.255	-0.385	-0.554	0.596
Lip	-0.902	0.950	-3.790	-5.949	-1.055	0.202	-1.172	0.287
Lip	-0.217	0.954	-5.742	-5.821	-1.774	0.392	0.431	0.536
Lip	-0.786	0.982	-4.854	-4.353	-1.282	1.189	-2.101	0.662
Hb	-18.643	-2.104	9.783	0.344	3.247	-0.633	-1.273	0.339
Hb	-18.582	-3.715	12.943	0.703	2.509	-1.721	-0.624	0.180
Hb	-18.974	-4.989	11.878	2.904	1.278	-0.166	-0.840	1.515
Hb	-19.964	-5.784	12.033	1.513	2.496	0.267	-0.558	0.166
Hb	-20.228	-4.736	11.522	1.871	0.114	0.368	0.870	1.593
Myo	-16.479	-0.017	7.164	0.428	-4.219	1.222	-1.025	-0.551
Myo	-17.755	-0.049	7.257	-0.859	-4.149	0.304	-0.483	-0.087
Myo	-17.147	-1.677	6.521	-0.029	-3.003	1.263	0.152	-0.309
Myo	-16.503	1.056	5.762	0.747	-3.283	0.939	1.116	-0.158
Myo	-16.056	-0.484	5.669	1.145	-3.234	0.712	0.050	-1.235
Pap	-10.788	-2.674	-2.414	-4.018	2.102	-0.098	0.026	-0.173
Pap	-10.468	-3.529	-1.232	-6.865	3.131	-0.662	0.107	-0.465
Pap	-9.331	-4.448	-0.751	-3.953	1.247	-1.006	2.809	-0.166
Pap	-10.450	-3.935	-0.450	-4.212	1.840	0.025	1.222	-2.013
Pap	-10.884	-1.347	-2.039	-7.372	1.635	-1.544	3.066	1.234
Try	-5.092	-6.296	-2.986	-3.326	-1.040	-2.831	0.523	1.031
Try	-7.159	-5.387	-3.942	-3.899	-2.263	-0.498	2.743	-0.729
Try	-6.652	-5.951	-3.739	-3.228	-1.380	-0.604	-0.122	0.203
Try	-5.582	-6.156	-5.465	-3.586	-2.015	0.573	-0.423	-0.003
Try	-4.880	-4.735	-4.978	-2.611	-0.489	0.379	-0.933	-0.523
Cyt-C	-3.682	12.059	-7.187	7.408	-1.374	-2.008	0.574	-0.510
Cyt-C	-4.594	13.365	-5.389	6.944	-0.590	-0.174	1.029	0.092
Cyt-C	-4.173	12.801	-4.643	6.842	0.127	-1.096	0.010	0.809
Cyt-C	-3.969	13.592	-4.583	7.607	-2.038	-0.484	0.791	0.283
Cyt-C	-4.700	13.730	-5.303	6.550	-1.446	-0.278	0.841	0.783
Lys	-8.643	13.011	-2.530	2.248	-1.308	1.671	-1.352	-1.405
Lys	-8.496	12.489	-1.684	3.288	2.740	0.449	-0.645	-0.577
Lys	-9.729	11.820	-2.245	1.757	2.407	1.629	-0.715	-1.721
Lys	-6.888	12.269	-2.576	3.884	2.317	0.569	-0.457	-0.379
Lys	-7.797	11.754	-3.021	4.710	4.117	-0.580	1.230	0.230

Table S5. Jackknifed classification matrix (12 protein at 0.5μM).

	α-Amy	Hb	BSA	Cas	Cyt-C	HSA	Lip	Lys	Myo	Pap	Pep	Try	**%correct**
α-Amy	5	0	0	0	0	0	0	0	0	0	0	0	100
Hb	0	5	0	0	0	0	0	0	0	0	0	0	100
BSA	0	0	5	0	0	0	0	0	0	0	0	0	100
Cas	0	0	0	5	0	0	0	0	0	0	0	0	100
Cyt-C	0	0	0	0	5	0	0	0	0	0	0	0	100
HSA	0	0	0	0	0	5	0	0	0	0	0	0	100
Lip	0	0	0	0	0	0	5	0	0	0	0	0	100
Lys	0	0	0	0	0	0	0	5	0	0	0	0	100
Myo	0	0	0	0	0	0	0	0	5	0	0	0	100
Pap	0	0	0	0	0	0	0	0	0	5	0	0	100
Pep	0	0	0	0	0	0	0	0	0	0	5	0	100
Try	0	0	0	0	0	0	0	0	0	0	0	5	100
Total	5	5	5	5	5	5	5	5	5	5	5	5	100

Table S6. Training matrix of fluorescence (QD@MPA) response pattern obtained from a sensor array against 12 protein (5 μM) in distilled (DI) water.

Analytes	Florescence Response Pattern							
Protein	E1	E2	E3	E4	E5	E6	E7	E8
Pep	0.056	-0.153	-0.087	-0.011	0.013	-0.271	0.133	0.082
Pep	0.124	-0.195	-0.067	0.015	0.046	-0.236	0.144	0.194
Pep	0.114	-0.226	-0.077	-0.029	0.027	-0.245	0.102	0.143
Pep	0.137	-0.166	-0.094	-0.029	0.049	-0.226	0.168	0.180
Pep	0.119	-0.217	-0.062	-0.008	0.075	-0.181	0.143	0.142
Cas	-0.050	-0.211	-0.113	-0.111	-0.052	-0.227	0.112	0.142
Cas	-0.035	-0.222	-0.092	-0.108	-0.030	-0.199	0.114	0.118
Cas	-0.006	-0.198	-0.115	-0.089	-0.021	-0.205	0.114	0.116
Cas	-0.046	-0.228	-0.079	-0.060	-0.037	-0.213	0.079	0.068
Cas	-0.003	-0.233	-0.072	-0.091	-0.038	-0.214	0.135	0.152
BSA	0.647	0.505	-0.021	0.146	0.806	0.296	0.500	0.371
BSA	0.671	0.514	-0.005	0.135	0.752	0.298	0.529	0.461
BSA	0.659	0.570	-0.050	0.131	0.805	0.332	0.492	0.447
BSA	0.679	0.597	0.014	0.225	0.914	0.379	0.481	0.511
BSA	0.727	0.639	0.043	0.164	0.871	0.381	0.582	0.490
α-Amy	0.234	0.146	-0.043	-0.014	0.050	-0.174	0.251	0.188
α-Amy	0.126	0.185	-0.018	-0.024	0.057	-0.158	0.191	0.188
α-Amy	0.263	0.238	-0.036	0.020	0.081	-0.165	0.246	0.233
α-Amy	0.261	0.085	-0.066	0.016	0.059	-0.193	0.211	0.199
α-Amy	0.295	0.123	-0.072	-0.001	0.052	-0.179	0.217	0.253
HSA	0.573	0.376	-0.141	-0.021	0.231	0.052	0.391	0.354
HSA	0.709	0.601	-0.075	0.075	0.307	0.007	0.446	0.433
HSA	0.754	0.629	-0.083	0.140	0.298	0.087	0.409	0.447
HSA	0.660	0.495	-0.056	0.066	0.344	0.041	0.409	0.435
HSA	0.712	0.498	-0.077	0.075	0.389	0.048	0.427	0.410

Lip	0.108	-0.191	0.008	0.165	0.095	-0.138	0.257	0.222
Lip	0.126	-0.189	0.027	0.114	0.077	-0.117	0.275	0.224
Lip	0.209	-0.217	-0.033	0.096	0.047	-0.143	0.188	0.229
Lip	0.232	-0.217	-0.028	0.096	0.020	-0.165	0.179	0.178
Lip	0.155	-0.150	0.057	0.137	0.092	-0.146	0.220	0.252
Hb	-0.371	-0.170	-0.344	-0.296	-0.098	-0.354	-0.220	-0.240
Hb	-0.382	-0.017	-0.321	-0.274	-0.110	-0.302	-0.183	-0.245
Hb	-0.395	-0.110	-0.272	-0.245	-0.046	-0.305	-0.292	-0.235
Hb	-0.404	-0.223	-0.365	-0.341	-0.090	-0.345	-0.276	-0.278
Hb	-0.433	-0.179	-0.358	-0.323	-0.118	-0.357	-0.278	-0.255
Myo	-0.382	-0.486	-0.676	-0.712	-0.281	-0.114	0.315	0.257
Myo	-0.197	-0.489	-0.699	-0.710	-0.283	-0.111	0.395	0.292
Myo	-0.274	-0.563	-0.725	-0.758	-0.377	-0.183	0.322	0.290
Myo	-0.288	-0.495	-0.698	-0.688	-0.286	-0.107	0.368	0.353
Myo	-0.302	-0.507	-0.686	-0.700	-0.273	-0.082	0.334	0.317
Pap	0.329	-0.139	-0.422	-0.412	-0.105	-0.318	0.219	0.176
Pap	0.279	-0.167	-0.399	-0.434	-0.148	-0.372	0.176	0.262
Pap	0.263	-0.201	-0.444	-0.478	-0.199	-0.407	0.184	0.255
Pap	0.198	-0.244	-0.448	-0.455	-0.151	-0.340	0.156	0.236
Pap	0.261	-0.173	-0.475	-0.431	-0.169	-0.350	0.138	0.263
Try	0.110	-0.265	-0.412	0.002	0.163	-0.006	0.177	0.231
Try	0.078	-0.290	-0.420	0.001	0.104	-0.077	0.167	0.188
Try	0.153	-0.315	-0.369	-0.010	0.106	-0.096	0.275	0.198
Try	0.152	-0.259	-0.430	-0.018	0.129	-0.112	0.180	0.139
Try	0.093	-0.287	-0.436	-0.010	0.084	-0.087	0.220	0.222
Cyt-C	-0.315	-0.473	-0.673	-0.688	-0.298	-0.492	-0.375	-0.334
Cyt-C	-0.247	-0.389	-0.606	-0.652	-0.182	-0.454	-0.292	-0.256
Cyt-C	-0.240	-0.501	-0.676	-0.661	-0.263	-0.447	-0.335	-0.268
Cyt-C	-0.216	-0.518	-0.659	-0.637	-0.317	-0.471	-0.354	-0.266
Cyt-C	-0.193	-0.453	-0.615	-0.654	-0.216	-0.420	-0.350	-0.263
Lys	0.124	-0.203	-0.340	-0.466	-0.159	-0.181	-0.296	-0.178
Lys	0.118	-0.213	-0.339	-0.501	-0.214	-0.271	-0.304	-0.237
Lys	0.146	-0.194	-0.336	-0.433	-0.235	-0.310	-0.289	-0.201
Lys	0.146	-0.236	-0.387	-0.473	-0.274	-0.262	-0.344	-0.281
Lys	0.166	-0.191	-0.253	-0.411	-0.234	-0.271	-0.257	-0.247

Table S7. LDA was carried out and resulting in 8 scores (12 protein at 5μM).

Analytes	Results LDA							
Protein	Score1	Score2	Score3	Score4	Score5	Score6	Score7	Score8
Pep	3.257	8.349	-6.604	0.062	1.166	-1.641	-1.153	1.464
Pep	5.149	7.888	-6.988	1.576	2.053	-0.310	-2.300	-0.810
Pep	3.254	8.444	-6.036	1.793	1.615	0.484	-2.743	-0.455
Pep	4.440	6.140	-5.410	1.564	1.670	-0.454	-2.220	0.043
Pep	4.883	7.837	-6.025	1.142	0.110	1.520	-2.751	0.221

Cas	1.236	5.471	-7.330	2.954	-1.644	-1.286	-1.545	-0.781
Cas	1.468	6.124	-6.881	2.960	-2.490	-0.175	-2.000	-0.210
Cas	1.883	5.929	-6.492	1.943	-1.533	-0.321	-1.183	-0.080
Cas	1.625	8.527	-7.800	1.875	-2.346	0.154	-1.133	0.213
Cas	2.302	6.439	-7.470	4.027	-1.729	-0.188	-2.342	-0.395
BSA	15.653	-2.798	14.180	-7.338	-2.246	1.138	-3.519	1.762
BSA	16.029	-3.749	13.585	-3.962	-2.362	0.784	-3.108	0.338
BSA	15.317	-4.722	15.470	-6.448	-2.575	0.481	-2.379	-0.321
BSA	17.755	-2.763	15.118	-7.731	-2.351	0.561	-3.559	-2.244
BSA	17.470	-4.335	16.606	-4.532	-3.884	0.462	-3.751	0.557
α-Amy	4.007	5.697	-0.232	4.431	-0.899	-3.259	1.273	1.440
α-Amy	2.243	6.677	-0.279	4.399	-2.862	-4.672	1.145	-0.308
α-Amy	4.348	5.837	0.970	4.214	-0.404	-4.540	2.073	0.228
α-Amy	4.612	6.520	-1.129	3.184	1.049	-2.302	1.129	0.509
α-Amy	4.349	5.432	0.038	4.616	1.088	-2.561	1.409	-0.592
HSA	7.975	-2.422	8.963	4.181	-0.847	-0.104	3.741	0.626
HSA	9.617	-0.865	11.920	4.404	2.056	-4.006	4.206	0.251
HSA	10.888	0.301	11.882	4.561	0.791	-1.748	7.208	-1.050
HSA	9.708	-0.232	10.743	3.973	1.067	-2.220	2.121	-0.732
HSA	10.479	-0.726	11.795	2.221	2.022	-1.536	1.946	0.385
Lip	11.290	8.906	-11.373	0.613	-0.271	0.914	-0.671	0.491
Lip	10.349	8.273	-10.081	2.927	-1.663	1.586	-1.333	0.851
Lip	8.694	8.759	-8.346	2.959	0.680	3.021	-0.536	-0.744
Lip	8.086	9.981	-7.974	3.222	0.843	3.407	-0.070	0.408
Lip	9.400	10.396	-8.995	3.495	-0.459	0.709	-1.870	-0.855
Hb	-11.257	6.350	-2.774	-7.493	-2.160	-4.776	0.926	0.505
Hb	-11.143	6.125	-1.503	-6.500	-4.795	-6.124	3.640	1.033
Hb	-11.783	9.690	-1.870	-7.250	-4.015	-4.677	0.758	-1.489
Hb	-12.988	6.418	-2.059	-8.144	-2.730	-3.710	-0.019	0.149
Hb	-13.036	6.684	-2.746	-7.594	-2.912	-5.035	1.049	-0.547
Myo	-4.190	-24.934	-7.690	2.228	-5.910	-0.849	-0.099	0.078
Myo	-2.197	-26.532	-6.028	3.643	-3.699	1.098	0.267	1.549
Myo	-4.746	-25.965	-7.708	4.853	-2.909	0.293	0.130	0.117
Myo	-1.904	-26.738	-8.154	3.325	-4.033	-0.288	0.401	-0.766
Myo	-2.790	-25.806	-7.426	3.203	-5.197	0.699	0.053	-0.775
Pap	-3.237	-7.468	4.483	3.941	5.930	-0.662	-1.048	2.356
Pap	-4.602	-6.997	3.261	6.308	6.872	-2.421	-2.447	-0.533
Pap	-5.392	-8.559	2.737	6.557	7.561	-2.725	-2.124	-0.080
Pap	-4.609	-8.401	1.683	4.465	5.821	-1.310	-2.189	-0.646
Pap	-4.705	-8.344	2.904	4.653	7.125	-1.835	-0.264	-1.515
Try	9.724	-4.320	-7.036	-9.119	1.965	4.507	3.325	-1.708
Try	8.941	-3.297	-8.472	-9.245	3.044	3.476	3.742	-0.743
Try	10.587	-3.863	-8.582	-7.133	3.475	3.849	1.925	1.699
Try	8.263	-3.228	-6.097	-10.058	4.528	3.328	3.145	1.024

Try	9.780	-5.114	-8.981	-8.603	3.564	2.944	3.984	-0.325
Cyt-C	-21.267	-2.128	2.314	-6.648	2.649	-0.682	-0.902	0.589
Cyt-C	-18.927	-2.795	3.978	-6.464	2.775	-1.759	-2.977	0.526
Cyt-C	-18.915	-3.284	2.127	-6.328	3.262	0.936	-1.123	-0.015
Cyt-C	-18.926	-1.591	1.183	-4.837	3.721	1.374	-0.298	-0.291
Cyt-C	-19.386	-1.524	4.296	-5.101	2.431	1.320	-2.289	-0.453
Lys	-15.129	6.263	9.197	4.195	-3.782	6.598	0.670	-1.468
Lys	-17.012	7.278	9.313	4.757	-2.496	5.326	0.167	0.086
Lys	-15.352	8.181	7.628	4.504	-0.535	4.294	1.405	-0.276
Lys	-16.928	8.093	8.634	4.196	-2.247	7.120	3.046	0.293
Lys	-14.640	10.488	7.562	6.403	-2.946	5.793	1.064	1.412

Table S8. Jackknifed classification matrix (12 protein at 5μM).

	α-Amy	Hb	BSA	Cas	Cyt-C	HSA	Lip	Lys	Myo	Pap	Pep	Try	**%correct**
α-Amy	5	0	0	0	0	0	0	0	0	0	0	0	100
Hb	0	5	0	0	0	0	0	0	0	0	0	0	100
BSA	0	0	5	0	0	0	0	0	0	0	0	0	100
Cas	0	0	0	5	0	0	0	0	0	0	0	0	100
Cyt-C	0	0	0	0	5	0	0	0	0	0	0	0	100
HSA	0	0	0	0	0	5	0	0	0	0	0	0	100
Lip	0	0	0	0	0	0	5	0	0	0	0	0	100
Lys	0	0	0	0	0	0	0	5	0	0	0	0	100
Myo	0	0	0	0	0	0	0	0	5	0	0	0	100
Pap	0	0	0	0	0	0	0	0	0	5	0	0	100
Pep	0	0	0	0	0	0	0	0	0	0	5	0	100
Try	0	0	0	0	0	0	0	0	0	0	0	5	100
Total	5	5	5	5	5	5	5	5	5	5	5	5	100

Table S9. Training matrix of fluorescence response pattern obtained from a sensor array against 12 protein (0.1 μM) in distilled (DI) water.

Analytes	Florescence Response Pattern							
Protein	E1	E2	E3	E4	E5	E6	E7	E8
Pep	-0.267	-0.225	-0.294	-0.180	-0.332	-0.440	-0.263	-0.325
Pep	-0.139	-0.120	-0.086	0.012	-0.190	-0.291	-0.116	-0.178
Pep	-0.091	-0.169	-0.086	0.005	-0.211	-0.277	-0.091	-0.181
Pep	-0.068	-0.169	-0.096	-0.095	-0.209	-0.284	-0.107	-0.155
Pep	-0.084	-0.120	-0.091	-0.179	-0.190	-0.235	-0.090	-0.181
Cas	-0.107	-0.174	-0.087	-0.127	-0.258	-0.265	-0.101	-0.176
Cas	-0.080	-0.216	-0.090	-0.137	-0.276	-0.295	-0.120	-0.188
Cas	-0.141	-0.261	-0.107	-0.078	-0.267	-0.314	-0.126	-0.174
Cas	-0.160	-0.199	-0.081	-0.084	-0.241	-0.299	-0.111	-0.188
Cas	-0.190	-0.176	-0.165	-0.103	-0.289	-0.376	-0.153	-0.222
BSA	-0.094	0.007	0.053	0.114	-0.040	-0.223	0.417	0.406
BSA	0.157	0.020	0.142	0.186	0.053	-0.155	0.488	0.454

BSA	0.203	0.098	0.138	0.036	0.016	-0.139	0.532	0.527
BSA	0.109	0.030	0.062	0.148	0.032	-0.078	0.505	0.494
BSA	0.163	0.062	0.034	0.146	0.005	-0.076	0.457	0.413
α-Amy	-0.080	-0.003	-0.029	-0.032	-0.098	-0.124	-0.023	-0.080
α-Amy	-0.036	-0.063	-0.032	-0.057	-0.090	-0.132	-0.044	-0.101
α-Amy	-0.063	-0.052	-0.025	0.017	-0.079	-0.136	-0.042	-0.100
α-Amy	-0.057	-0.086	-0.050	-0.011	-0.127	-0.155	-0.099	-0.135
α-Amy	-0.118	-0.060	-0.181	-0.050	-0.120	-0.231	-0.132	-0.136
HSA	0.003	0.109	0.004	0.143	0.030	-0.136	0.544	0.559
HSA	0.203	0.172	0.147	0.248	0.082	-0.064	0.605	0.633
HSA	0.188	0.157	0.148	0.222	0.078	-0.060	0.605	0.650
HSA	0.207	0.126	0.161	0.217	0.104	-0.023	0.597	0.588
HSA	0.146	0.102	0.059	0.222	0.096	-0.008	0.538	0.549
Lip	-0.056	0.007	0.004	0.031	-0.035	-0.040	-0.022	-0.058
Lip	0.019	0.006	0.025	0.029	-0.038	-0.062	-0.008	-0.073
Lip	-0.051	0.031	-0.044	0.016	-0.028	-0.070	-0.044	-0.077
Lip	-0.103	0.013	-0.063	0.030	-0.048	-0.075	-0.026	-0.119
Lip	-0.120	-0.092	-0.142	-0.021	-0.120	-0.138	-0.092	-0.135
Hb	-0.316	-0.388	-0.692	-0.675	-0.334	-0.131	0.326	0.460
Hb	-0.226	-0.281	-0.679	-0.636	-0.244	-0.034	0.484	0.614
Hb	-0.216	-0.343	-0.700	-0.677	-0.275	-0.070	0.449	0.561
Hb	-0.216	-0.281	-0.683	-0.671	-0.274	-0.043	0.437	0.576
Hb	-0.207	-0.279	-0.682	-0.669	-0.283	-0.043	0.380	0.487
Myo	-0.133	-0.113	-0.282	-0.160	-0.004	0.046	0.308	0.300
Myo	-0.093	-0.090	-0.300	-0.196	-0.016	0.039	0.308	0.231
Myo	-0.134	-0.142	-0.319	-0.169	-0.022	0.043	0.325	0.275
Myo	-0.137	-0.169	-0.330	-0.176	-0.044	0.029	0.293	0.181
Myo	-0.179	-0.069	-0.373	-0.164	-0.098	-0.061	0.271	0.193
Pap	0.019	-0.004	-0.098	0.012	0.095	-0.030	0.120	0.061
Pap	0.051	0.092	0.020	0.057	0.118	0.077	0.216	0.094
Pap	0.044	0.071	0.003	0.055	0.084	0.087	0.162	0.030
Pap	0.054	0.018	-0.028	0.027	0.076	0.088	0.145	0.111
Pap	0.000	0.074	-0.006	0.065	0.073	0.088	0.133	0.047
Try	0.032	0.097	0.041	0.019	0.064	0.085	0.070	-0.002
Try	-0.005	0.039	-0.041	0.007	0.014	0.027	0.086	0.021
Try	-0.027	0.044	0.025	0.042	0.010	0.008	0.084	0.011
Try	-0.073	-0.104	-0.044	0.037	0.007	0.034	0.031	-0.016
Try	-0.088	-0.134	-0.146	-0.049	-0.026	0.010	0.010	0.013
Cyt-C	-0.138	-0.207	-0.452	-0.383	-0.154	-0.119	-0.246	-0.250
Cyt-C	-0.066	-0.195	-0.375	-0.338	-0.105	-0.044	-0.260	-0.215
Cyt-C	-0.014	-0.178	-0.394	-0.394	-0.119	-0.068	-0.227	-0.191
Cyt-C	-0.037	-0.131	-0.410	-0.404	-0.145	-0.059	-0.222	-0.182
Cyt-C	0.005	-0.111	-0.410	-0.408	-0.085	-0.036	-0.215	-0.198
Lys	-0.054	-0.100	-0.323	-0.233	-0.031	0.016	0.178	0.081

Lys	-0.032	-0.156	-0.310	-0.230	-0.048	-0.021	0.206	0.059
Lys	-0.060	-0.189	-0.286	-0.181	-0.082	-0.025	0.171	0.073
Lys	-0.066	-0.146	-0.262	-0.139	-0.052	-0.012	0.194	0.094
Lys	-0.147	-0.166	-0.321	-0.163	-0.106	-0.055	0.141	0.067

Table S10. LDA was carried out and resulting in 8 scores (12 protein at 0.1μM).

Analytes	Results LDA							
Protein	Score1	Score2	Score3	Score4	Score5	Score6	Score7	Score8
Pep	11.008	-0.868	7.993	-1.201	1.450	2.461	-1.538	-0.263
Pep	10.530	2.942	4.520	-0.729	-0.043	1.332	-0.233	-0.577
Pep	9.379	2.739	5.851	-2.162	0.820	0.835	1.389	-0.336
Pep	9.644	1.195	6.504	-0.109	0.996	-0.574	0.185	-0.271
Pep	9.689	-1.011	5.470	-1.282	0.287	-1.651	-1.427	1.407
Cas	8.715	0.108	8.053	-1.687	-0.927	-0.705	0.733	0.907
Cas	9.225	0.293	9.343	-1.459	0.085	-1.151	1.182	0.449
Cas	8.728	1.275	8.349	-1.697	-0.207	-0.668	1.021	-1.400
Cas	9.321	1.241	7.205	-2.234	-0.742	-0.800	-0.407	-0.430
Cas	9.272	1.472	8.089	-1.431	0.302	1.395	-0.616	0.254
BSA	-8.029	10.972	1.987	-0.340	-1.270	-0.443	-3.173	-1.213
BSA	-6.965	12.937	1.130	0.296	2.919	-1.772	-0.546	-1.133
BSA	-9.336	10.956	3.390	2.404	1.793	-2.534	-1.253	1.612
BSA	-10.017	10.418	0.017	0.552	0.742	-0.377	0.724	-0.570
BSA	-8.044	9.763	0.634	0.354	1.853	1.044	2.326	1.049
α-Amy	8.870	0.795	1.018	0.306	-2.223	0.075	-0.746	1.098
α-Amy	9.886	0.289	1.469	0.264	-0.596	-1.187	-0.501	0.258
α-Amy	10.003	1.611	0.533	0.022	-0.961	-0.117	-0.218	-0.298
α-Amy	11.049	0.677	2.262	0.762	-1.123	0.154	0.868	-0.280
α-Amy	10.388	0.456	0.427	2.517	0.810	2.164	-1.233	-0.814
HSA	-12.829	11.594	-1.195	1.642	-0.133	1.520	-1.921	-0.266
HSA	-11.668	14.233	-0.690	3.406	0.559	0.987	1.063	0.482
HSA	-12.054	13.685	-0.404	3.778	-0.071	0.361	0.718	0.182
HSA	-10.716	12.677	-1.355	1.640	0.818	-0.714	0.866	0.188
HSA	-10.496	11.034	-3.197	2.034	0.588	1.139	1.554	-0.660
Lip	9.923	0.566	-1.669	1.079	-3.043	-0.081	0.087	0.070
Lip	10.362	1.383	-0.467	0.578	-1.135	-0.478	0.628	0.748
Lip	10.489	0.492	-2.395	1.831	-1.633	0.799	-0.549	0.270
Lip	9.444	0.560	-2.376	-1.012	-1.729	1.289	-0.525	0.714
Lip	9.144	-0.474	0.183	0.075	-1.053	1.515	0.641	-0.583
Hb	-24.695	-10.634	6.011	0.810	-2.071	-0.582	-0.651	-1.057
Hb	-29.320	-9.426	2.790	1.459	-1.395	0.102	-0.288	0.029
Hb	-28.485	-10.124	4.371	0.600	-0.158	-0.618	-0.042	-0.151
Hb	-27.867	-10.380	4.004	2.098	-1.707	0.094	0.113	0.600
Hb	-25.150	-11.079	4.063	1.339	-1.257	0.320	0.517	1.171
Myo	-9.601	-2.475	-4.995	-1.031	-1.178	-0.277	-0.791	-1.475

Myo	-9.003	-3.054	-4.471	-2.848	0.548	-0.041	-0.630	0.369
Myo	-10.849	-2.779	-4.641	-2.930	-0.226	0.082	-0.124	-1.063
Myo	-9.415	-3.300	-4.029	-5.269	0.783	0.080	0.249	-0.420
Myo	-9.758	-1.639	-2.730	-2.960	0.256	3.125	-0.429	1.037
Pap	4.948	1.442	-6.559	0.547	2.804	-0.544	-1.920	-1.414
Pap	3.733	1.945	-6.879	-1.528	0.065	-0.981	-1.055	1.088
Pap	5.176	0.860	-6.164	-2.028	-0.442	-0.442	0.233	1.403
Pap	4.083	0.152	-5.674	1.139	-1.010	-0.826	0.894	-0.407
Pap	5.398	0.588	-6.382	-0.601	-2.042	0.116	0.219	0.763
Try	8.766	-0.403	-5.216	0.747	-2.581	-0.951	-0.215	1.487
Try	5.819	0.018	-3.860	0.210	-1.632	0.143	0.326	0.909
Try	6.900	1.230	-3.086	-0.289	-2.638	-0.463	-0.237	0.795
Try	6.870	-0.765	-3.961	-1.011	-2.486	-1.193	0.979	-2.102
Try	5.057	-2.530	-3.439	0.736	-1.922	-0.635	0.950	-2.419
Cyt-C	9.544	-10.571	-1.145	1.999	2.369	0.509	-0.746	-0.552
Cyt-C	11.661	-10.657	-2.218	4.174	1.305	-0.467	0.449	-1.401
Cyt-C	10.302	-10.675	-0.972	4.466	2.787	-0.638	0.316	-0.282
Cyt-C	9.401	-11.020	-0.664	4.836	1.482	0.523	0.571	0.863
Cyt-C	10.526	-11.299	-2.787	4.673	3.223	-0.066	-0.266	0.795
Lys	-3.516	-4.819	-4.064	-2.486	2.202	0.021	-0.265	0.883
Lys	-4.224	-3.847	-2.484	-4.798	3.881	-0.842	-0.018	0.822
Lys	-3.697	-3.306	-1.307	-3.680	1.913	-0.430	1.305	-0.248
Lys	-3.733	-2.366	-2.555	-3.543	1.545	-0.044	0.820	-0.182
Lys	-3.782	-3.099	-1.639	-3.032	0.447	1.106	0.636	-0.437

Table S11. Jackknifed Classification Matrix (12 protein at 0.1 μM).

	Try	Cyt-C	Lys	Pep	Cas	BSA	HSA	Lip	α-Amy	Hb	Myo	Pap	**%correct**
Try	5	0	0	0	0	0	0	0	0	0	0	0	100
Cyt-C	0	5	0	0	0	0	0	0	0	0	0	0	100
Lys	0	0	5	0	0	0	0	0	0	0	0	0	100
Pep	0	0	0	2	3	0	0	0	0	0	0	0	40
Cas	0	0	0	1	4	0	0	0	0	0	0	0	80
BSA	0	0	0	0	0	5	0	0	0	0	0	0	100
HSA	0	0	0	0	0	0	5	0	0	0	0	0	100
Lip	0	0	0	0	0	0	0	3	2	0	0	0	60
α-Amy	0	0	0	0	0	0	0	2	3	0	0	0	60
Hb	0	0	0	0	0	0	0	0	0	5	0	0	100
Myo	0	0	0	0	0	0	0	0	0	0	5	0	100
Pap	1	0	0	0	0	0	0	0	0	0	0	4	80
Total	6	5	5	3	7	5	5	5	5	5	5	4	85

Table S12. Training matrix of fluorescence (QDs@PEG) response pattern obtained from a sensor array against 12 protein (0.5μM) in distilled (DI) water.

Analytes	Florescence Response Pattern

Protein	E1	E2	E3	E4	E5	E6	E7	E8
Pep	-0.108	-0.079	-0.355	-0.284	-0.063	-0.219	-0.437	-0.426
Pep	-0.017	0.068	-0.258	-0.259	-0.025	-0.200	-0.381	-0.357
Pep	-0.006	0.128	-0.262	-0.278	-0.092	-0.209	-0.402	-0.377
Pep	-0.001	0.163	-0.207	-0.227	-0.012	-0.178	-0.384	-0.347
Pep	-0.037	0.107	-0.185	-0.223	-0.065	-0.184	-0.404	-0.352
Cas	0.222	0.109	-0.110	-0.412	-0.399	-0.521	-0.504	-0.518
Cas	0.222	0.100	-0.101	-0.414	-0.368	-0.516	-0.500	-0.535
Cas	0.208	0.100	-0.113	-0.403	-0.385	-0.517	-0.500	-0.532
Cas	0.236	0.116	-0.158	-0.429	-0.400	-0.530	-0.511	-0.535
Cas	0.169	0.086	-0.186	-0.478	-0.409	-0.555	-0.529	-0.541
BSA	0.127	0.175	-0.124	-0.233	-0.200	-0.246	-0.199	-0.123
BSA	0.103	0.060	-0.123	-0.260	-0.172	-0.246	-0.144	-0.014
BSA	0.136	0.073	-0.187	-0.259	-0.210	-0.302	-0.167	-0.070
BSA	-0.017	-0.112	-0.199	-0.273	-0.176	-0.296	-0.157	-0.056
BSA	-0.008	-0.072	-0.191	-0.262	-0.182	-0.269	-0.174	-0.061
α-Amy	-0.116	-0.148	-0.423	-0.451	-0.330	-0.384	-0.466	-0.383
α-Amy	-0.099	-0.209	-0.434	-0.455	-0.343	-0.389	-0.445	-0.405
α-Amy	-0.148	-0.194	-0.460	-0.433	-0.324	-0.397	-0.474	-0.425
α-Amy	-0.206	-0.220	-0.460	-0.434	-0.337	-0.419	-0.472	-0.429
α-Amy	-0.260	-0.263	-0.494	-0.464	-0.377	-0.440	-0.494	-0.471
HSA	0.029	0.145	-0.041	-0.204	-0.160	-0.260	-0.140	-0.010
HSA	0.039	0.214	-0.126	-0.217	-0.134	-0.255	-0.108	0.084
HSA	-0.055	0.029	-0.156	-0.261	-0.248	-0.295	-0.138	0.059
HSA	-0.104	-0.032	-0.144	-0.264	-0.193	-0.234	-0.142	0.053
HSA	-0.090	-0.089	-0.166	-0.223	-0.186	-0.224	-0.142	0.027
Lip	-0.176	-0.120	-0.387	-0.401	-0.185	-0.333	-0.398	-0.292
Lip	-0.147	-0.124	-0.383	-0.421	-0.176	-0.332	-0.408	-0.299
Lip	-0.158	-0.182	-0.403	-0.375	-0.182	-0.336	-0.382	-0.304
Lip	-0.175	-0.155	-0.395	-0.373	-0.143	-0.325	-0.382	-0.309
Lip	-0.207	-0.197	-0.429	-0.397	-0.175	-0.338	-0.438	-0.379
Hb	-0.308	-0.346	-0.452	-0.647	-0.426	-0.427	-0.228	-0.130
Hb	-0.274	-0.375	-0.569	-0.657	-0.373	-0.423	-0.249	-0.083
Hb	-0.251	-0.266	-0.491	-0.618	-0.417	-0.443	-0.225	-0.283
Hb	-0.206	-0.313	-0.501	-0.642	-0.423	-0.425	-0.213	-0.126
Hb	-0.212	-0.272	-0.465	-0.612	-0.351	-0.423	-0.226	-0.115
Myo	-0.364	-0.271	-0.565	-0.737	-0.692	-0.697	-0.541	-0.433
Myo	-0.332	-0.393	-0.609	-0.734	-0.659	-0.676	-0.543	-0.435
Myo	-0.276	-0.387	-0.642	-0.712	-0.691	-0.684	-0.527	-0.439
Myo	-0.353	-0.276	-0.577	-0.686	-0.677	-0.709	-0.533	-0.464
Myo	-0.356	-0.408	-0.610	-0.716	-0.707	-0.706	-0.569	-0.481
Pap	-0.003	-0.022	-0.379	-0.414	-0.218	-0.366	-0.361	-0.317
Pap	0.003	0.028	-0.271	-0.413	-0.222	-0.354	-0.405	-0.277
Pap	0.060	0.120	-0.375	-0.418	-0.167	-0.335	-0.341	-0.272

Pap	0.019	0.037	-0.316	-0.408	-0.173	-0.374	-0.350	-0.270
Pap	0.036	0.037	-0.404	-0.412	-0.175	-0.325	-0.389	-0.292
Try	-0.102	0.018	-0.344	-0.435	-0.258	-0.344	-0.393	-0.298
Try	-0.055	-0.012	-0.336	-0.485	-0.238	-0.349	-0.373	-0.311
Try	-0.049	-0.071	-0.409	-0.404	-0.215	-0.347	-0.369	-0.304
Try	-0.035	0.105	-0.284	-0.403	-0.178	-0.350	-0.374	-0.330
Try	-0.144	-0.135	-0.451	-0.479	-0.274	-0.427	-0.449	-0.351
Cyt-C	-0.031	-0.161	-0.456	-0.520	-0.459	-0.560	-0.547	-0.453
Cyt-C	-0.034	-0.160	-0.409	-0.603	-0.441	-0.550	-0.504	-0.411
Cyt-C	0.048	-0.072	-0.423	-0.551	-0.475	-0.561	-0.523	-0.416
Cyt-C	-0.029	-0.151	-0.429	-0.548	-0.459	-0.557	-0.549	-0.425
Cyt-C	0.008	-0.183	-0.444	-0.542	-0.470	-0.568	-0.564	-0.453
Lys	-0.051	-0.090	-0.464	-0.608	-0.523	-0.554	-0.507	-0.364
Lys	0.008	-0.136	-0.481	-0.640	-0.514	-0.577	-0.472	-0.329
Lys	-0.054	-0.136	-0.484	-0.612	-0.559	-0.566	-0.474	-0.394
Lys	-0.003	-0.161	-0.446	-0.593	-0.497	-0.561	-0.508	-0.380
Lys	0.003	-0.126	-0.447	-0.614	-0.517	-0.532	-0.485	-0.392

Table S13. LDA was carried out and resulting in 8 scores (0.5μM, QDs@PEG).

Analytes	Results LDA							
Protein	Score1	Score2	Score3	Score4	Score5	Score6	Score7	Score8
Pep	-8.464	12.222	-4.806	-0.693	-1.175	1.356	0.894	0.092
Pep	-9.818	11.259	-2.892	0.558	-0.659	0.156	-0.277	0.084
Pep	-8.218	10.411	-3.120	-0.495	-0.306	1.532	-2.223	0.124
Pep	-10.811	12.039	-2.544	-0.545	-0.494	-0.103	-1.656	-0.217
Pep	-10.254	11.191	-1.392	-2.055	-1.301	1.037	-1.715	-1.392
Cas	11.780	5.518	9.985	1.890	-2.169	-0.054	-0.286	-0.367
Cas	11.663	6.498	9.619	3.016	-2.775	-0.614	0.170	-0.352
Cas	11.216	5.840	9.687	1.964	-2.655	-0.224	-0.039	0.036
Cas	12.556	5.800	9.010	2.282	-1.412	0.091	-0.268	0.533
Cas	13.723	5.512	7.161	2.504	-1.764	-1.295	-0.375	-0.044
BSA	-11.474	-2.235	5.872	-0.434	0.409	2.295	-1.971	1.051
BSA	-13.056	-4.871	6.524	1.206	0.727	1.081	0.094	-0.395
BSA	-10.593	-5.046	7.222	0.418	1.493	1.054	0.680	2.094
BSA	-12.776	-5.471	5.626	0.635	-0.890	-0.326	2.765	0.511
BSA	-13.189	-4.566	5.142	-0.233	-0.444	0.763	1.642	0.033
α-Amy	0.678	3.444	-2.487	-1.671	0.320	2.229	-0.259	-0.717
α-Amy	0.934	2.655	-1.771	-0.328	-0.552	3.323	0.698	-0.066
α-Amy	0.433	3.958	-2.793	-2.254	-0.349	2.075	0.729	0.522
α-Amy	0.252	2.933	-2.916	-3.056	-1.309	1.095	0.912	0.715
α-Amy	1.507	2.518	-4.097	-3.421	-2.157	1.459	0.672	0.848
HSA	-14.943	-5.347	7.383	-1.591	-1.012	-1.633	-0.911	-0.118
HSA	-16.800	-7.045	5.291	-2.249	2.265	-2.752	-1.476	1.184
HSA	-14.562	-9.731	6.021	-3.542	0.640	-0.731	-0.618	-0.290

HSA	-16.649	-7.479	3.918	-2.456	-0.385	-0.083	-0.473	-2.115
HSA	-17.524	-6.811	4.914	-2.948	-0.547	1.251	0.820	-1.195
Lip	-5.278	4.011	-4.072	-1.063	-0.046	-1.526	0.653	-0.701
Lip	-4.150	4.928	-4.097	0.117	0.242	-1.477	0.853	-1.288
Lip	-5.816	3.716	-2.759	-0.831	-0.352	-0.704	2.178	0.264
Lip	-6.546	4.856	-3.859	-0.463	-0.643	-1.817	1.974	0.239
Lip	-4.345	6.482	-4.968	-1.000	-1.057	-0.927	1.810	-0.153
Hb	-2.990	-12.460	-5.362	3.917	-2.436	0.340	-0.394	-1.864
Hb	-3.169	-10.788	-7.027	3.781	1.327	-0.171	1.164	-1.317
Hb	-1.948	-10.484	-6.060	5.310	-4.023	1.281	-0.752	2.560
Hb	-2.453	-12.409	-4.753	4.905	-0.420	1.694	-0.018	-0.215
Hb	-3.249	-10.170	-4.626	4.628	-0.282	-0.961	0.595	-0.556
Myo	14.532	-8.684	-4.144	-3.913	-1.563	-2.065	-2.130	-0.215
Myo	14.286	-7.234	-3.793	-2.427	-0.970	-0.665	0.246	-0.571
Myo	14.385	-8.401	-2.466	-2.857	-0.108	1.015	0.501	1.110
Myo	13.709	-8.328	-2.944	-4.747	-1.957	-2.266	-1.037	1.720
Myo	15.458	-7.533	-2.728	-4.214	-1.769	-0.287	0.263	0.070
Pap	-2.317	2.765	-1.415	1.809	0.929	-0.258	0.426	1.712
Pap	-1.177	4.157	0.180	0.646	1.131	-1.170	-0.674	-1.841
Pap	-3.352	3.581	-2.861	2.759	2.904	-1.116	-1.156	2.064
Pap	-2.406	3.089	-0.363	2.380	1.203	-2.858	0.581	0.893
Pap	-2.839	5.320	-2.994	1.564	3.291	0.058	-0.315	0.910
Try	-2.903	2.313	-3.409	-0.581	0.342	-0.232	-2.261	-0.639
Try	-1.277	2.581	-3.566	3.207	-0.194	-0.367	-1.497	-0.962
Try	-3.729	2.890	-2.329	0.595	1.163	0.328	0.676	1.323
Try	-2.876	4.491	-2.279	1.518	-0.446	-2.618	-1.602	0.648
Try	0.957	3.106	-3.640	-0.513	0.811	-1.862	0.888	0.162
Cyt-C	10.701	2.041	1.941	-1.990	1.544	0.136	1.437	0.516
Cyt-C	11.273	0.686	0.463	2.106	0.525	-0.942	0.702	-1.386
Cyt-C	11.880	0.847	2.561	-0.360	2.522	0.324	0.120	0.216
Cyt-C	11.301	1.891	1.766	-1.262	1.719	-0.322	0.961	-0.892
Cyt-C	12.544	2.550	2.817	-1.040	1.952	0.528	1.837	-0.495
Lys	10.805	-2.281	-0.439	-1.150	2.581	0.652	-1.661	-0.678
Lys	11.934	-3.611	0.738	1.422	3.311	0.202	-0.027	-0.373
Lys	10.712	-4.236	-0.023	-0.385	1.320	1.991	-1.295	0.765
Lys	11.656	-1.052	1.670	0.290	2.240	0.692	0.516	-0.877
Lys	11.074	-1.827	0.279	1.338	1.709	2.389	-1.090	-0.708

Table S14. Jackknifed classification matrix (0.5μM, QDs@PEG).

	α-Amy	Hb	BSA	Cas	Cyt-C	HSA	Lip	Lys	Myo	Pap	Pep	Try	**%correct**
α-Amy	5	0	0	0	0	0	0	0	0	0	0	0	100
Hb	0	5	0	0	0	0	0	0	0	0	0	0	100
BSA	0	0	5	0	0	0	0	0	0	0	0	0	100
Cas	0	0	0	5	0	0	0	0	0	0	0	0	100

Cyt	0	0	0	0	4	0	0	1	0	0	0	0	80
HSA	0	0	1	0	0	4	0	0	0	0	0	0	80
Lip	0	0	0	0	0	0	5	0	0	0	0	0	100
Lys	0	0	0	0	1	0	0	4	0	0	0	0	80
Myo	0	0	0	0	0	0	0	0	5	0	0	0	100
Pap	0	0	0	0	0	0	0	0	0	4	0	1	80
Pep	0	0	0	0	0	0	0	0	0	0	5	0	100
Try	1	0	0	0	0	0	0	0	0	2	0	2	40
Total	6	5	6	5	5	4	5	5	5	6	5	3	88

Table S15. Training matrix of fluorescence response pattern obtained from a sensor array against 12 protein.

	1	2	3	4	5	6	7	8
Amy	4.092	-10.489	-4.735	-0.15	1.15	1.264	-0.691	-0.535
BH	-21.917	-4.324	10.421	1.793	2.755	-0.141	-0.75	0.644
BSA	19.225	-11.552	1.008	3.657	-0.098	1.345	1.722	0.159
Cas	20.129	19.944	4.22	-6.241	0.963	0.494	0.151	0.29
Cyt	-4.153	11.663	-5.332	8.719	-1.008	-1.314	0.243	-0.166
HSA	26.54	-5.576	7.21	2.675	-0.674	-1.329	-1.053	-1.045
Lip	-0.671	1.525	-4.181	-6.479	-1.466	0.208	-0.338	0.353
Lys	-8.835	11.413	-2.846	4.211	1.543	1.857	-0.307	-0.571
Myo	-19.938	0.313	6.301	0.04	-3.816	0.818	0.218	-0.177
Pap	-10.965	-3.652	-1.684	-5.665	2.25	-0.496	0.559	-1.028
Pep	3.28	-5.325	-6.668	1.996	0.074	-0.945	-1.151	1.259
Try	-6.653	-5.773	-3.572	-4.456	-1.722	-1.173	0.111	-0.214

Table S16. Detection and identification of 12 unknown proteins by using our sensor array, the concentrations of prepared unknown protein samples are 0.5 μM.

	1	2	3	4	5	6	7	8	Identification	Verification
sample1	6.753	-4.561	-7.394	-0.239	0.166	0.231	1.129	-0.829	Pep	Pep
sample2	-4.649	-5.08	-4.535	-2.802	-0.588	1.086	-0.839	-0.151	Try	Try
sample3	-5.151	12.743	-5.163	7.811	-1.577	-1.169	0.856	0.431	Cyt-C	Cyt-C

sample4	-7.922	10.361	-3.823	5.809	4.345	-1.15	1.107	-0.211	Lys	Lys
sample5	19.738	22.291	5.688	-3.863	-1.171	-0.097	-0.168	0.499	Cas	Cas
sample6	18.962	-10.689	2.045	1.685	0.117	0.697	2.879	1.811	BSA	BSA
sample7	4.315	-8.914	-3.949	0.449	1.228	1.018	-1.164	0.792	Amy	Amy
sample8	23.304	-4.879	7.597	1.662	0.406	-1.597	-0.89	0.237	HSA	HSA
sample9	-1.107	1.45	-4.336	-4.483	-1.452	1.903	-1.34	1.414	Lip	Lip
sample10	-23.706	-4.499	10.555	1.599	0.218	-0.865	1.335	1.242	BH	BH
sample11	-18.32	-0.453	5.297	1.378	-3.366	0.99	0.059	-1.133	Myo	Myo
sample12	-12.749	-0.441	-2.549	-9.4	1.873	-3.402	2.168	0.02	Pap	Pap

Table S17. Training matrix of fluorescence response pattern obtained from a sensor array against mixtures of HSA, Hb or Lys (0.5μM) in distilled (DI) water.

Analytes	Florescence Response Pattern							
Protein	E1	E2	E3	E4	E5	E6	E7	E8
HSA100%	0.463	0.995	0.397	0.450	0.269	0.053	0.748	0.752
HSA100%	0.579	0.957	0.500	0.566	0.356	0.177	0.824	0.857
HSA100%	0.659	0.831	0.605	0.584	0.389	0.171	0.822	0.836
HSA100%	0.715	1.026	0.568	0.437	0.370	0.199	0.846	0.902
HSA100%	0.661	0.917	0.546	0.570	0.399	0.242	0.866	0.800
HSA/Lys=4/1	0.552	0.600	0.355	0.227	0.201	0.153	0.785	0.777
HSA/Lys=4/1	0.624	0.505	0.339	0.264	0.218	0.125	0.846	0.789
HSA/Lys=4/1	0.686	0.652	0.409	0.360	0.298	0.172	0.861	0.873
HSA/Lys=4/1	0.553	0.670	0.329	0.351	0.263	0.134	0.751	0.753
HSA/Lys=4/1	0.562	0.605	0.228	0.235	0.187	0.040	0.743	0.766
HSA/Lys=3/2	0.374	0.206	0.203	0.124	0.063	-0.014	0.730	0.658
HSA/Lys=3/2	0.516	0.373	0.289	0.216	0.169	0.054	0.730	0.788
HSA/Lys=3/2	0.533	0.284	0.225	0.093	0.153	0.043	0.720	0.764
HSA/Lys=3/2	0.613	0.418	0.301	0.131	0.166	0.052	0.689	0.780
HSA/Lys=3/2	0.550	0.345	0.268	0.177	0.166	0.094	0.809	0.718
HSA/Lys=2/3	0.402	0.149	-0.010	0.032	-0.127	0.028	0.506	0.718
HSA/Lys=2/3	0.428	0.121	-0.138	-0.029	-0.078	-0.028	0.531	0.659
HSA/Lys=2/3	0.379	0.195	-0.145	0.060	-0.035	-0.001	0.530	0.701
HSA/Lys=2/3	0.347	0.116	-0.102	0.084	-0.025	-0.018	0.480	0.636
HSA/Lys=2/3	0.340	0.195	0.008	0.056	-0.002	-0.070	0.526	0.693
HSA/Lys=1/4	0.225	0.271	-0.357	-0.353	-0.076	-0.051	0.304	0.659
HSA/Lys=1/4	0.376	0.408	-0.367	-0.380	-0.118	-0.027	0.191	0.705
HSA/Lys=1/4	0.372	0.425	-0.311	-0.310	-0.069	0.045	0.346	0.711
HSA/Lys=1/4	0.386	0.427	-0.276	-0.277	-0.156	0.077	0.224	0.783
HSA/Lys=1/4	0.356	0.400	-0.301	-0.290	-0.024	0.117	0.325	0.764
Lys100%	0.173	0.219	-0.430	-0.471	-0.127	-0.227	-0.211	0.175
Lys100%	0.164	0.202	-0.452	-0.497	-0.197	-0.156	-0.239	0.198
Lys100%	0.219	0.159	-0.469	-0.530	-0.229	-0.175	-0.259	0.172

Lys100%	0.119	0.156	-0.472	-0.485	-0.201	-0.165	-0.283	0.118
Lys100%	0.160	0.164	-0.485	-0.489	-0.241	-0.216	-0.181	0.134
Lys/Hb=4/1	-0.239	-0.231	-0.691	-0.701	-0.340	-0.083	0.247	0.534
Lys/Hb=4/1	-0.293	-0.304	-0.693	-0.702	-0.410	-0.172	0.164	0.601
Lys/Hb=4/1	-0.250	-0.312	-0.707	-0.719	-0.411	-0.110	0.172	0.572
Lys/Hb=4/1	-0.213	-0.301	-0.659	-0.686	-0.384	-0.304	0.248	0.641
Lys/Hb=4/1	-0.258	-0.294	-0.701	-0.703	-0.411	-0.030	0.191	0.519
Lys/Hb=3/2	-0.250	-0.348	-0.723	-0.750	-0.433	0.025	0.321	0.671
Lys/Hb=3/2	-0.220	-0.346	-0.722	-0.752	-0.658	0.025	0.381	0.645
Lys/Hb=3/2	-0.250	-0.343	-0.737	-0.744	-0.414	0.036	0.425	0.666
Lys/Hb=3/2	-0.259	-0.340	-0.730	-0.732	-0.416	-0.009	0.337	0.585
Lys/Hb=3/2	-0.248	-0.352	-0.720	-0.737	-0.334	0.038	0.375	0.670
Lys/Hb=2/3	-0.076	-0.168	-0.617	-0.661	-0.134	0.052	0.460	0.643
Lys/Hb=2/3	0.037	-0.147	-0.596	-0.646	-0.139	0.068	0.468	0.695
Lys/Hb=2/3	-0.006	-0.110	-0.634	-0.684	-0.163	0.056	0.544	0.754
Lys/Hb=2/3	-0.141	-0.103	-0.625	-0.657	-0.144	0.024	0.425	0.744
Lys/Hb=2/3	-0.070	-0.135	-0.650	-0.643	-0.095	0.126	0.538	0.691
Lys/Hb=1/4	-0.069	-0.084	-0.611	-0.580	-0.210	0.033	0.377	0.664
Lys/Hb=1/4	0.047	-0.096	-0.609	-0.581	-0.188	0.063	0.456	0.625
Lys/Hb=1/4	-0.105	-0.127	-0.613	-0.580	-0.178	0.014	0.374	0.671
Lys/Hb=1/4	-0.131	-0.120	-0.607	-0.570	-0.176	0.017	0.397	0.563
Lys/Hb=1/4	-0.154	-0.160	-0.589	-0.596	-0.197	0.004	0.404	0.654
Hb100%	-0.284	-0.173	-0.634	-0.612	-0.191	0.027	0.349	0.516
Hb100%	-0.309	-0.183	-0.616	-0.581	-0.150	0.053	0.367	0.468
Hb100%	-0.198	-0.197	-0.644	-0.635	-0.208	0.024	0.379	0.494
Hb100%	-0.217	-0.157	-0.645	-0.636	-0.228	0.071	0.326	0.554
Hb100%	-0.204	-0.103	-0.648	-0.607	-0.144	0.106	0.387	0.547
Hb/HSA=4/1	-0.232	-0.227	-0.672	-0.585	-0.088	0.249	0.606	0.670
Hb/HSA=4/1	-0.197	-0.214	-0.667	-0.604	-0.091	0.231	0.554	0.629
Hb/HSA=4/1	-0.265	-0.342	-0.718	-0.631	-0.152	0.179	0.522	0.651
Hb/HSA=4/1	-0.328	-0.332	-0.695	-0.641	-0.115	0.168	0.560	0.598
Hb/HSA=4/1	-0.311	-0.325	-0.685	-0.635	-0.140	0.159	0.573	0.629
Hb/HSA=3/2	-0.168	-0.195	-0.692	-0.569	-0.044	0.292	0.792	0.792
Hb/HSA=3/2	-0.187	-0.247	-0.703	-0.574	-0.052	0.295	0.721	0.871
Hb/HSA=3/2	-0.214	-0.291	-0.713	-0.619	-0.045	0.341	0.804	0.900
Hb/HSA=3/2	-0.205	-0.267	-0.709	-0.618	-0.074	0.295	0.745	0.871
Hb/HSA=3/2	-0.220	-0.279	-0.718	-0.592	-0.063	0.315	0.716	0.847
Hb/HSA=2/3	-0.208	-0.271	-0.573	-0.453	0.116	0.449	0.915	1.014
Hb/HSA=2/3	-0.145	-0.276	-0.599	-0.472	0.093	0.452	0.834	0.921
Hb/HSA=2/3	-0.131	-0.284	-0.588	-0.440	0.127	0.486	0.948	0.947
Hb/HSA=2/3	-0.178	-0.297	-0.597	-0.450	0.114	0.507	0.891	0.905
Hb/HSA=2/3	-0.205	-0.226	-0.560	-0.456	0.108	0.392	0.930	0.943
Hb/HSA=1/4	0.271	0.179	0.050	0.115	0.391	0.479	1.246	1.109
Hb/HSA=1/4	0.235	0.164	0.111	0.119	0.398	0.515	1.205	1.229

Hb/HSA=1/4	0.337	0.164	0.096	0.140	0.415	0.587	1.262	1.273
Hb/HSA=1/4	0.313	0.245	0.098	0.120	0.438	0.620	1.212	1.233
Hb/HSA=1/4	0.230	0.220	0.073	0.071	0.406	0.586	1.096	1.131
HSA/Lys/Hb=1:1:1	-0.035	-0.035	-0.580	-0.459	0.088	0.396	0.918	1.051
HSA/Lys/Hb=1:1:1	0.031	-0.058	-0.584	-0.457	0.129	0.381	0.946	1.034
HSA/Lys/Hb=1:1:1	0.001	-0.066	-0.659	-0.485	0.130	0.349	0.904	1.027
HSA/Lys/Hb=1:1:1	-0.038	-0.061	-0.592	-0.508	0.111	0.360	0.918	0.984
HSA/Lys/Hb=1:1:1	-0.017	-0.054	-0.597	-0.515	0.085	0.330	0.933	0.991

Table S18. LDA was carried out and resulting in 8 scores (Mixtures at 0.5 μM).

Analytes	Results LDA							
Protein	Score1	Score2	Score3	Score4	Score5	Score6	Score7	Score8
HSA100%	0.463	0.995	0.397	0.450	0.269	0.053	0.748	0.752
HSA100%	0.579	0.957	0.500	0.566	0.356	0.177	0.824	0.857
HSA100%	0.659	0.831	0.605	0.584	0.389	0.171	0.822	0.836
HSA100%	0.715	1.026	0.568	0.437	0.370	0.199	0.846	0.902
HSA100%	0.661	0.917	0.546	0.570	0.399	0.242	0.866	0.800
HSA/Lys=4/1	0.552	0.600	0.355	0.227	0.201	0.153	0.785	0.777
HSA/Lys=4/1	0.624	0.505	0.339	0.264	0.218	0.125	0.846	0.789
HSA/Lys=4/1	0.686	0.652	0.409	0.360	0.298	0.172	0.861	0.873
HSA/Lys=4/1	0.553	0.670	0.329	0.351	0.263	0.134	0.751	0.753
HSA/Lys=4/1	0.562	0.605	0.228	0.235	0.187	0.040	0.743	0.766
HSA/Lys=3/2	0.374	0.206	0.203	0.124	0.063	-0.014	0.730	0.658
HSA/Lys=3/2	0.516	0.373	0.289	0.216	0.169	0.054	0.730	0.788
HSA/Lys=3/2	0.533	0.284	0.225	0.093	0.153	0.043	0.720	0.764
HSA/Lys=3/2	0.613	0.418	0.301	0.131	0.166	0.052	0.689	0.780
HSA/Lys=3/2	0.550	0.345	0.268	0.177	0.166	0.094	0.809	0.718
HSA/Lys=2/3	0.402	0.149	-0.010	0.032	-0.127	0.028	0.506	0.718
HSA/Lys=2/3	0.428	0.121	-0.138	-0.029	-0.078	-0.028	0.531	0.659
HSA/Lys=2/3	0.379	0.195	-0.145	0.060	-0.035	-0.001	0.530	0.701
HSA/Lys=2/3	0.347	0.116	-0.102	0.084	-0.025	-0.018	0.480	0.636
HSA/Lys=2/3	0.340	0.195	0.008	0.056	-0.002	-0.070	0.526	0.693
HSA/Lys=1/4	0.225	0.271	-0.357	-0.353	-0.076	-0.051	0.304	0.659
HSA/Lys=1/4	0.376	0.408	-0.367	-0.380	-0.118	-0.027	0.191	0.705
HSA/Lys=1/4	0.372	0.425	-0.311	-0.310	-0.069	0.045	0.346	0.711
HSA/Lys=1/4	0.386	0.427	-0.276	-0.277	-0.156	0.077	0.224	0.783
HSA/Lys=1/4	0.356	0.400	-0.301	-0.290	-0.024	0.117	0.325	0.764
Lys100%	0.173	0.219	-0.430	-0.471	-0.127	-0.227	-0.211	0.175
Lys100%	0.164	0.202	-0.452	-0.497	-0.197	-0.156	-0.239	0.198

Lys100%	0.219	0.159	-0.469	-0.530	-0.229	-0.175	-0.259	0.172
Lys100%	0.119	0.156	-0.472	-0.485	-0.201	-0.165	-0.283	0.118
Lys100%	0.160	0.164	-0.485	-0.489	-0.241	-0.216	-0.181	0.134
Lys/Hb=4/1	-0.239	-0.231	-0.691	-0.701	-0.340	-0.083	0.247	0.534
Lys/Hb=4/1	-0.293	-0.304	-0.693	-0.702	-0.410	-0.172	0.164	0.601
Lys/Hb=4/1	-0.250	-0.312	-0.707	-0.719	-0.411	-0.110	0.172	0.572
Lys/Hb=4/1	-0.213	-0.301	-0.659	-0.686	-0.384	-0.304	0.248	0.641
Lys/Hb=4/1	-0.258	-0.294	-0.701	-0.703	-0.411	-0.030	0.191	0.519
Lys/Hb=3/2	-0.250	-0.348	-0.723	-0.750	-0.433	0.025	0.321	0.671
Lys/Hb=3/2	-0.220	-0.346	-0.722	-0.752	-0.658	0.025	0.381	0.645
Lys/Hb=3/2	-0.250	-0.343	-0.737	-0.744	-0.414	0.036	0.425	0.666
Lys/Hb=3/2	-0.259	-0.340	-0.730	-0.732	-0.416	-0.009	0.337	0.585
Lys/Hb=3/2	-0.248	-0.352	-0.720	-0.737	-0.334	0.038	0.375	0.670
Lys/Hb=2/3	-0.076	-0.168	-0.617	-0.661	-0.134	0.052	0.460	0.643
Lys/Hb=2/3	0.037	-0.147	-0.596	-0.646	-0.139	0.068	0.468	0.695
Lys/Hb=2/3	-0.006	-0.110	-0.634	-0.684	-0.163	0.056	0.544	0.754
Lys/Hb=2/3	-0.141	-0.103	-0.625	-0.657	-0.144	0.024	0.425	0.744
Lys/Hb=2/3	-0.070	-0.135	-0.650	-0.643	-0.095	0.126	0.538	0.691
Lys/Hb=1/4	-0.069	-0.084	-0.611	-0.580	-0.210	0.033	0.377	0.664
Lys/Hb=1/4	0.047	-0.096	-0.609	-0.581	-0.188	0.063	0.456	0.625
Lys/Hb=1/4	-0.105	-0.127	-0.613	-0.580	-0.178	0.014	0.374	0.671
Lys/Hb=1/4	-0.131	-0.120	-0.607	-0.570	-0.176	0.017	0.397	0.563
Lys/Hb=1/4	-0.154	-0.160	-0.589	-0.596	-0.197	0.004	0.404	0.654
Hb100%	-0.284	-0.173	-0.634	-0.612	-0.191	0.027	0.349	0.516
Hb100%	-0.309	-0.183	-0.616	-0.581	-0.150	0.053	0.367	0.468
Hb100%	-0.198	-0.197	-0.644	-0.635	-0.208	0.024	0.379	0.494
Hb100%	-0.217	-0.157	-0.645	-0.636	-0.228	0.071	0.326	0.554
Hb100%	-0.204	-0.103	-0.648	-0.607	-0.144	0.106	0.387	0.547
Hb/HSA=4/1	-0.232	-0.227	-0.672	-0.585	-0.088	0.249	0.606	0.670
Hb/HSA=4/1	-0.197	-0.214	-0.667	-0.604	-0.091	0.231	0.554	0.629
Hb/HSA=4/1	-0.265	-0.342	-0.718	-0.631	-0.152	0.179	0.522	0.651
Hb/HSA=4/1	-0.328	-0.332	-0.695	-0.641	-0.115	0.168	0.560	0.598
Hb/HSA=4/1	-0.311	-0.325	-0.685	-0.635	-0.140	0.159	0.573	0.629
Hb/HSA=3/2	-0.168	-0.195	-0.692	-0.569	-0.044	0.292	0.792	0.792
Hb/HSA=3/2	-0.187	-0.247	-0.703	-0.574	-0.052	0.295	0.721	0.871
Hb/HSA=3/2	-0.214	-0.291	-0.713	-0.619	-0.045	0.341	0.804	0.900
Hb/HSA=3/2	-0.205	-0.267	-0.709	-0.618	-0.074	0.295	0.745	0.871
Hb/HSA=3/2	-0.220	-0.279	-0.718	-0.592	-0.063	0.315	0.716	0.847
Hb/HSA=2/3	-0.208	-0.271	-0.573	-0.453	0.116	0.449	0.915	1.014
Hb/HSA=2/3	-0.145	-0.276	-0.599	-0.472	0.093	0.452	0.834	0.921
Hb/HSA=2/3	-0.131	-0.284	-0.588	-0.440	0.127	0.486	0.948	0.947
Hb/HSA=2/3	-0.178	-0.297	-0.597	-0.450	0.114	0.507	0.891	0.905
Hb/HSA=2/3	-0.205	-0.226	-0.560	-0.456	0.108	0.392	0.930	0.943
Hb/HSA=1/4	0.271	0.179	0.050	0.115	0.391	0.479	1.246	1.109

Hb/HSA=1/4	0.235	0.164	0.111	0.119	0.398	0.515	1.205	1.229
Hb/HSA=1/4	0.337	0.164	0.096	0.140	0.415	0.587	1.262	1.273
Hb/HSA=1/4	0.313	0.245	0.098	0.120	0.438	0.620	1.212	1.233
Hb/HSA=1/4	0.230	0.220	0.073	0.071	0.406	0.586	1.096	1.131
HSA/Lys/Hb=1:1:1	-0.035	-0.035	-0.580	-0.459	0.088	0.396	0.918	1.051
HSA/Lys/Hb=1:1:1	0.031	-0.058	-0.584	-0.457	0.129	0.381	0.946	1.034
HSA/Lys/Hb=1:1:1	0.001	-0.066	-0.659	-0.485	0.130	0.349	0.904	1.027
HSA/Lys/Hb=1:1:1	-0.038	-0.061	-0.592	-0.508	0.111	0.360	0.918	0.984
HSA/Lys/Hb=1:1:1	-0.017	-0.054	-0.597	-0.515	0.085	0.330	0.933	0.991

Table S19. Jackknifed Classification Matrix (Mixtures at 0.5 μM).

	B1H4	B2H3	B3H2	B4H1	Hb	H1L1B1	H1L4	H2L3	H3L2	H4L1	HSA	L1B4	L2B3	L3B2	L4B1	Lys	**%correct**
B1H4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
B2H3	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
B3H2	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	100
B4H1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	100
Hb	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	100
H1L1B1	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	100
H1L4	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	100
H2L3	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	100
H3L2	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	100
H4L1	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	100
HSA	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	100
L1B4	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	100
L2B3	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	100
L3B2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	100
L4B1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	100
Lys	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	100
Total	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	100

Notes: B1H4, B2H3, B3H2, B4H1, Hb, H1L1B1, H1L4, H2L3, H3L2, H3L1, HSA, L1B4, L2B3, L3B2, L4B1, Lys are Hb/HSA=1:4, Hb/HSA=2:3, Hb/HSA=3:2, Hb/HSA=4:1, Hb100%, HSA/Lys/Hb=1:1:1, Hb/Lys=1:4, Hb/Lys=2:3, Hb/Lys=3:2, Hb/Lys=4:1, HSA100%, Lys/Hb=1:4, Lys/Hb=2:3 Lys/Hb=3:2 Lys/Hb=4:1, Lys100% respectively.

Table S20. Training matrix of fluorescence response pattern obtained from a sensor array against HSA of different concentrations (form 0.01 μM to 5 μM) and control in distilled (DI) water.

Analytes	Florescence Response Pattern							
Concentration	E1	E2	E3	E4	E5	E6	E7	E8
5 μM	363	469	731	929	747	925	1,277	1,580

5 μM	372	440	724	934	767	988	1,343	1,645
5 μM	382	472	740	931	759	974	1,339	1,635
5 μM	368	461	747	923	771	1,002	1,346	1,687
5 μM	373	462	732	974	803	1,033	1,333	1,643
2 μM	441	557	921	1,009	672	906	1,299	1,636
2 μM	433	565	902	989	664	825	1,378	1,623
2 μM	445	563	924	1,090	699	837	1,406	1,639
2 μM	445	552	944	1,056	699	832	1,368	1,656
2 μM	422	569	958	1,058	644	773	1,355	1,641
1 μM	428	574	967	1,111	582	760	1,340	1,591
1 μM	431	543	971	1,063	605	767	1,309	1,594
1 μM	472	553	1,045	1,101	609	772	1,383	1,644
1 μM	434	588	1,024	1,081	606	776	1,204	1,581
1 μM	424	581	1,016	1,116	632	860	1,339	1,602
0.5 μM	454	540	1,072	1,185	649	837	1,317	1,549
0.5 μM	473	547	1,066	1,159	668	852	1,328	1,503
0.5 μM	435	481	1,027	1,175	679	824	1,365	1,525
0.5 μM	498	560	1,066	1,219	650	836	1,300	1,528
0.5 μM	488	561	1,117	1,234	689	814	1,390	1,483
0.2 μM	356	333	768	979	564	702	1,097	1,393
0.2 μM	362	309	784	994	618	740	1,102	1,412
0.2 μM	380	303	774	1,002	594	748	1,127	1,453
0.2 μM	397	295	766	948	592	798	1,127	1,456
0.2 μM	361	288	742	896	611	801	1,113	1,342
0.1 μM	320	245	684	766	520	736	1,001	1,269
0.1 μM	295	268	679	843	543	724	1,039	1,259
0.1 μM	340	253	668	813	527	708	1,016	1,247
0.1 μM	312	246	686	873	547	731	969	1,225
0.1 μM	316	275	659	831	523	655	980	1,186
0.02 μM	303	240	570	712	513	747	846	1,043
0.02 μM	303	239	584	720	505	739	840	1,005
0.02 μM	307	258	588	772	548	759	817	1,050
0.02 μM	296	238	579	796	538	741	855	1,016
0.02 μM	293	242	632	779	520	674	864	996
0.01 μM	322	318	685	822	565	811	813	899
0.01 μM	338	299	703	832	575	807	830	924
0.01 μM	339	331	716	844	571	831	848	923
0.01 μM	336	318	689	850	595	876	888	956
0.01 μM	349	328	670	876	600	863	870	935
Control	254	269	631	701	485	740	734	898
Control	299	270	639	699	488	727	736	870
Control	294	250	632	724	508	748	741	897
Control	281	263	669	724	512	719	704	844
Control	288	284	665	733	498	696	714	842

Table S21. LDA was carried out and resulting in 8 scores (HSA of different concentrations).

Analytes	Results LDA							
Concentration	Score1	Score2	Score3	Score4	Score5	Score6	Score7	Score8
5 μM	-18.289	-12.045	-3.454	0.201	-0.293	0.475	0.382	-1.084
5 μM	-18.794	-12.139	-2.256	1.991	-0.373	-0.544	-0.542	0.355
5 μM	-20.170	-11.657	-3.430	0.865	0.134	-0.069	-0.340	0.313
5 μM	-21.509	-12.436	-2.624	1.063	-1.623	-0.743	-0.130	0.607
5 μM	-19.935	-12.348	-4.049	3.240	-0.621	-1.042	0.424	-0.367
2 μM	-19.864	-0.453	-2.271	-1.723	0.128	-0.349	1.431	1.784
2 μM	-22.066	-2.360	-2.319	-3.266	1.232	1.444	-1.203	0.519
2 μM	-22.028	-1.168	-1.640	-0.414	1.777	1.120	-0.593	-0.850
2 μM	-22.411	-1.663	-1.034	-0.867	0.036	2.252	0.462	-0.071
2 μM	-21.467	0.491	0.016	-3.273	0.008	0.691	-0.215	-1.016
1 μM	-16.400	5.970	1.179	-3.482	2.282	-2.414	-0.746	-1.023
1 μM	-16.358	4.100	1.410	-2.870	0.346	-0.156	0.024	-0.030
1 μM	-18.091	7.533	2.399	-1.973	0.305	0.741	-0.702	1.421
1 μM	-17.135	5.616	-0.132	-3.709	-1.231	-0.136	3.260	-0.353
1 μM	-17.461	7.206	-1.042	-1.747	-0.825	-3.026	-0.460	-0.041
0.5 μM	-12.990	10.849	0.543	1.590	-1.320	-1.033	0.241	-0.038
0.5 μM	-12.944	10.353	-1.649	1.982	-0.575	0.643	-0.381	0.705
0.5 μM	-11.218	8.289	1.478	3.531	-1.698	0.088	-1.788	-0.829
0.5 μM	-12.360	11.572	-0.142	2.398	1.669	-0.136	1.637	0.391
0.5 μM	-13.642	12.584	-1.807	3.372	-0.306	1.924	-1.555	-0.680
0.2 μM	1.788	-0.633	6.612	0.279	0.627	-0.494	0.816	-1.458
0.2 μM	1.107	-1.801	6.496	2.699	-1.094	0.891	1.476	-1.272
0.2 μM	1.434	-0.884	8.088	2.670	0.559	-0.169	1.421	-0.213
0.2 μM	1.906	-0.809	7.324	2.571	0.605	-0.100	1.173	2.052
0.2 μM	3.882	-1.998	3.983	2.304	-0.867	0.692	-0.873	1.108
0.1 μM	9.606	-2.506	5.703	-1.534	-1.468	-0.094	-1.124	2.059
0.1 μM	8.352	-2.720	4.865	-0.764	-1.071	-1.422	-1.873	-0.847
0.1 μM	9.918	-2.711	5.579	-0.602	0.956	0.659	-0.932	1.065
0.1 μM	11.882	-1.404	5.588	1.026	-0.870	-0.981	0.138	-0.599
0.1 μM	10.347	-3.268	4.428	-1.508	1.067	0.916	-0.771	-1.288
0.02 μM	17.537	-4.518	0.761	-1.512	1.439	-0.082	-0.153	0.964
0.02 μM	19.254	-2.842	0.471	-1.343	1.348	-0.170	-0.634	0.870
0.02 μM	16.397	-4.847	0.108	-0.114	1.114	0.159	1.756	-0.344
0.02 μM	18.820	-3.443	0.802	0.591	1.689	-0.666	-0.126	-1.052
0.02 μM	18.414	-1.854	1.284	-0.764	0.103	1.172	-1.073	-1.267
0.01 μM	19.106	2.443	-5.612	0.900	0.247	-0.223	0.190	-0.322
0.01 μM	19.073	2.723	-4.335	1.926	-0.056	0.849	0.344	0.248
0.01 μM	18.045	4.057	-5.723	1.356	0.346	-0.391	-0.099	0.320
0.01 μM	17.263	2.652	-5.729	2.562	0.643	-1.215	-0.631	0.520
0.01 μM	17.631	2.028	-6.157	3.018	2.371	-0.750	0.268	-0.174

Control	21.985	0.266	-2.402	-3.178	-2.158	-1.670	-0.285	-0.333
Control	22.726	0.928	-2.856	-2.490	-0.290	0.649	0.043	0.854
Control	22.846	0.201	-1.918	-1.051	-0.761	0.218	0.512	0.516
Control	23.264	1.226	-3.166	-1.560	-2.433	1.273	0.662	-0.383
Control	22.549	1.420	-3.370	-2.391	-1.096	1.223	0.568	-0.737

Table S22. Jackknifed classification matrix (HSA of different concentrations).

	Control	0.01 μM	0.02 μM	0.1μM	0.2 μM	0.5 μM	1 μM	2 μM	5 μM	**%correct**
Control	5	0	0	0	0	0	0	0	0	100
0.01 μM	0	5	0	0	0	0	0	0	0	100
0.02 μM	0	0	5	0	0	0	0	0	0	100
0.1μM	0	0	0	5	0	0	0	0	0	100
0.2 μM	0	0	0	0	5	0	0	0	0	100
0.5 μM	0	0	0	0	0	5	0	0	0	100
1 μM	0	0	0	0	0	0	5	0	0	100
2 μM	0	0	0	0	0	0	0	5	0	100
5 μM	0	0	0	0	0	0	0	0	5	100
Total	5	5	5	5	5	5	5	5	5	100

Table S23. Training matrix of fluorescence response pattern obtained from a sensor array against artificial urine sample including HSA of different concentrations (form 0 μM to 50 μM).

Analytes	Florescence Response Pattern							
Concentration	E1	E2	E3	E4	E5	E6	E7	E8
0.05 μM	0.134	-0.008	-0.312	-0.406	-0.345	-0.549	-0.520	-0.594
0.05 μM	0.249	0.062	-0.281	-0.354	-0.305	-0.520	-0.510	-0.601
0.05 μM	0.236	-0.047	-0.340	-0.419	-0.372	-0.545	-0.526	-0.601
0.05 μM	0.097	-0.019	-0.330	-0.431	-0.399	-0.548	-0.511	-0.605
0.05 μM	0.146	-0.018	-0.365	-0.410	-0.369	-0.569	-0.524	-0.611
0 μM	0.030	-0.116	-0.405	-0.473	-0.410	-0.587	-0.566	-0.618
0 μM	0.151	-0.067	-0.363	-0.459	-0.386	-0.567	-0.550	-0.617
0 μM	0.097	-0.113	-0.395	-0.472	-0.405	-0.586	-0.566	-0.635
0 μM	0.063	-0.113	-0.380	-0.463	-0.402	-0.571	-0.560	-0.645
0 μM	0.014	-0.155	-0.400	-0.472	-0.430	-0.594	-0.575	-0.637
0.1 μM	0.194	-0.020	-0.345	-0.439	-0.423	-0.580	-0.523	-0.585
0.1 μM	0.184	-0.082	-0.366	-0.470	-0.430	-0.588	-0.534	-0.613
0.1μM	0.080	-0.149	-0.397	-0.481	-0.432	-0.613	-0.587	-0.608
0.1 μM	0.071	-0.182	-0.394	-0.494	-0.448	-0.612	-0.562	-0.618
0.1 μM	-0.011	-0.172	-0.451	-0.513	-0.484	-0.614	-0.586	-0.624
0.5 μM	0.277	0.141	-0.222	-0.329	-0.322	-0.539	-0.466	-0.524
0.5 μM	0.418	0.154	-0.186	-0.310	-0.283	-0.510	-0.482	-0.489
0.5 μM	0.564	0.183	-0.198	-0.329	-0.289	-0.523	-0.480	-0.520
0.5 μM	0.319	0.079	-0.247	-0.363	-0.341	-0.532	-0.479	-0.530
0.5 μM	0.367	0.087	-0.221	-0.288	-0.300	-0.522	-0.500	-0.552
1 μM	0.186	-0.022	-0.190	-0.320	-0.386	-0.565	-0.515	-0.525

1 µM	0.277	-0.014	-0.194	-0.350	-0.394	-0.564	-0.512	-0.544
1 µM	0.327	0.011	-0.203	-0.275	-0.338	-0.558	-0.513	-0.564
1 µM	0.159	-0.055	-0.221	-0.329	-0.391	-0.588	-0.544	-0.555
1 µM	0.154	-0.028	-0.249	-0.357	-0.416	-0.591	-0.547	-0.552
5 µM	0.346	0.096	-0.272	-0.340	-0.256	-0.482	-0.428	-0.451
5 µM	0.539	0.267	-0.178	-0.210	-0.130	-0.409	-0.422	-0.409
5 µM	0.746	0.330	-0.141	-0.293	-0.175	-0.424	-0.433	-0.421
5 µM	0.469	0.157	-0.191	-0.273	-0.217	-0.434	-0.446	-0.421
5 µM	0.441	0.189	-0.153	-0.288	-0.220	-0.426	-0.402	-0.435

Table S24. LDA was carried out and resulting in 8 scores (Artificial urine samples).

Analytes	Result LDA				
Concentration	Score 1	Score 2	Score 3	Score 4	Score 5
0.05 µM	-3.056	-4.095	-2.083	-0.836	-1.012
0.05 µM	-3.281	-4.371	-3.579	-0.701	-0.039
0.05 µM	-3.161	-3.378	0.362	-0.235	1.222
0.05 µM	-2.665	-4.483	-1.710	0.074	1.711
0.05 µM	-2.006	-4.228	-1.269	1.427	0.596
0 µM	-3.379	-6.008	0.550	-0.525	-0.732
0 µM	-3.620	-5.905	-0.142	-0.482	-0.778
0 µM	-2.842	-6.857	0.239	-0.425	-0.778
0 µM	-3.697	-7.857	-0.909	-1.489	-0.056
0 µM	-1.062	-6.604	0.528	-1.175	-0.118
0.1 µM	1.865	-1.581	0.958	2.441	1.346
0.1 µM	0.339	-3.705	1.262	1.474	0.873
0.1 µM	1.273	-4.158	2.524	-0.213	-1.729
0.1 µM	0.935	-4.004	2.548	-0.250	-0.401
0.1 µM	-0.515	-5.527	2.907	0.784	0.986
0.5 µM	3.349	2.814	-2.377	2.210	-0.200
0.5 µM	1.873	4.783	-0.530	0.432	-1.438
0.5 µM	3.011	3.235	-0.542	2.728	-1.330
0.5 µM	0.987	2.401	-0.243	1.301	0.536
0.5 µM	4.019	1.818	-1.720	-0.021	0.695
1 µM	12.169	5.093	0.325	-1.588	0.220
1 µM	11.138	3.610	0.556	-0.835	0.295
1 µM	11.828	3.469	-0.931	-0.438	0.886
1 µM	13.418	3.011	0.152	-1.522	-0.783
5 µM	12.192	2.408	0.598	-0.062	-0.166
5 µM	-10.003	7.268	1.936	0.777	0.729
5 µM	-11.849	9.148	-0.631	-0.765	-0.186
5 µM	-9.417	7.069	0.150	1.235	-2.149
5 µM	-8.523	8.936	1.758	-1.763	0.742
5 µM	-9.318	7.699	-0.687	-1.558	1.058

Table S25. Jackknifed classification matrix (Artificial urine samples).

	0 µM	0.05 µM	0.1 µM	1 µM	0.5 µM	5 µM	**%correct**
0 µM	5	0	0	0	0	0	100
0.05 µM	1	4	0	0	0	0	80
0.1 µM	1	0	3	0	1	0	60
1 µM	0	0	0	5	0	0	100
0.5 µM	0	0	0	0	5	0	100
5 µM	0	0	0	0	0	5	100
Total	7	4	3	5	6	5	90