Supplementary Material (ESI) for Lab on a Chip

Supporting Information

Improvement of proteolytic efficiency towards low-level proteins by an antifouling surface of alumina gel in a microchannel

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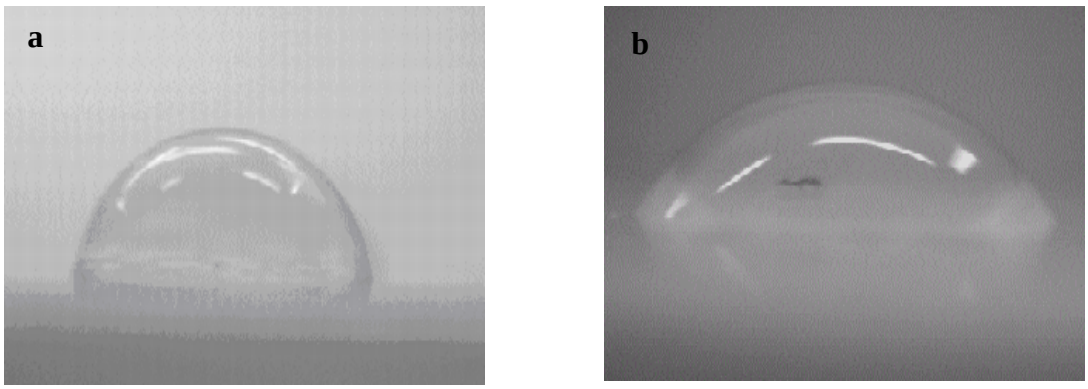

Figure SI-1 Contact angle determination of PET surface.(a) micrograph of water droplet on original PET surface; (b) micrograph of water droplet on NaOH hydrolyzed PET surface.

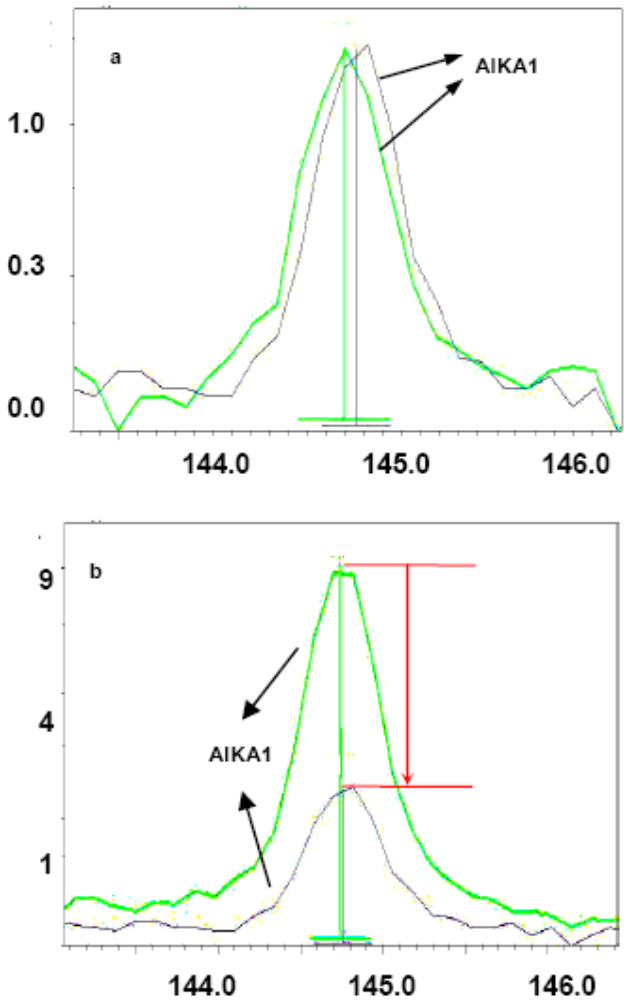

Figure SI-2 (a) The X-ray fluorescence spectrometry from hydrolyzed PET surface modified by Al2O3 sol-gel (b) The X-ray fluorescence spectrometry from unhydrolyzed PET surface dropped by Al2O3 sol-gel. Green line: before washed in PBS buffer; Blue line: after washed in PBS buffer.

Table SI-1 The detailed identification information of proteins from the extracts of normal mouse liver using Al_2O_3-derived enzymatic microreactor

protein	AANum	pI	Mw	protein probability	percent coverage	num unique peps	tot indep spectra
sp|009131|GSTO1_MOUSE	240	6.910063	27497.62	1	17.5	4	9
sp|035295|PURB_MOUSE	324	5.340027	33901.42	1	12	2	3
sp|054962|BAF_MOUSE	89	5.790038	10102.59	1	40.4	3	4
sp|055125|NIPS1_MOUSE	284	9.480122	33363.22	1	12.3	4	5
sp|055131|SEPT7_MOUSE	436	8.720104	50549.93	1	8	2	5
sp|P02088|HBB1_MOUSE	147	7.120068	15840.17	1	32.7	4	7
sp|P07309|TTHY_MOUSE	147	5.760037	15775.92	1	27.2	3	4
sp|P07724|ALBU_MOUSE	608	5.740036	68692.6	1	17.6	11	25
sp|P08003|PDIA4_MOUSE	638	5.130023	71973.5	1	22.9	9	17
sp|P08228|SODC_MOUSE	154	6.020043	15942.67	1	46.1	7	14
sp|P09405|NUCL_MOUSE	707	4.680012	76723.28	1	4.2	2	2
sp|P09528|FRIH_MOUSE	182	5.530032	21066.6	1	15.4	3	4
sp|P10853|H2B1F_MOUSE	126	10.31014	13936.16	1	11.9	3	4
sp|P11352|GPX1_MOUSE	200	6.730059	22179.25	1	53.7	9	17
sp|P12710|FABPL_MOUSE	127	8.580101	14245.55	1	33.9	5	10
sp|P12787|COX5A_MOUSE	146	6.070044	16101.47	1	17.8	5	8
sp|P14211|CALR_MOUSE	416	4.330004	47994.6	1	22.4	5	8
sp|P15105|GLNA_MOUSE	373	6.630057	42119.68	1	7.8	2	3
sp|P16015|CAH3_MOUSE	260	6.890063	29366.28	1	39.6	8	16
sp|P17742|PPIA_MOUSE	164	7.730082	17971.34	1	17.1	2	4
sp|P18760|COF1_MOUSE	166	8.210093	18559.54	1	27.1	2	4
sp|P24270|CATA_MOUSE	527	7.720082	59765.36	1	25.6	10	21
sp|P24369|PPIB_MOUSE	216	9.550123	23713.48	1	16.2	3	4
sp|P25444|RS2_MOUSE	293	10.25014	31231.32	1	5.8	2	3
sp|P25688|URIC_MOUSE	303	8.480099	35039.19	1	12.9	3	6
sp|P26443|DHE3_MOUSE	558	8.050089	61336.87	1	4.5	2	5
sp|P26645|MARCS_MOUSE	309	4.340004	29661.3	1	17.2	4	10
sp|P27773|PDIA3_MOUSE	505	5.88004	56678.46	1	37.2	18	33
sp|P29341|PABP1_MOUSE	636	9.470121	70642.73	1	7.7	4	9
sp|P32020|NLTP_MOUSE	547	7.150069	59125.73	1	11	8	16
sp|P32067|LA_MOUSE	415	9.770128	47756.5	1	6.7	2	4
sp|P47199|QOR_MOUSE	331	8.170092	35268.59	1	15.7	3	4
sp|P48758|CBR1_MOUSE	277	8.5301	30641.21	1	37.2	7	14
sp|P52196|THTR_MOUSE	297	7.700081	33465.91	1	14.5	3	8
sp|P54869|HMCS2_MOUSE	508	8.640102	56822.82	1	11.4	4	5
sp|P62245|RS15A_MOUSE	130	10.14014	14839.5	1	28.5	4	8
sp|P62270|RS18_MOUSE	152	10.98016	17718.67	1	28.3	4	8
sp|P62960|YBOX1_MOUSE	322	9.870131	35729.97	1	14.9	2	4
sp|P70296|PEBP1_MOUSE	187	5.190024	20830.44	1	25.7	4	4
sp|P97351|RS3A_MOUSE	264	9.750128	29884.86	1	11.4	2	4
sp|P97855|G3BP1_MOUSE	465	5.400029	51828.8	1	13.8	4	9
sp|P99027|RLA2_MOUSE	115	4.420006	11650.91	1	61.7	7	13
sp|Q03265|ATPA_MOUSE	553	9.220116	59752.64	1	9.8	5	6
sp|Q05816|FABP5_MOUSE	135	6.130045	15137.4	1	8.9	2	4
sp|Q5FW57|GLYAL_MOUSE	296	7.65008	34108.37	1	35.5	11	22
sp|Q61207|SAP_MOUSE	557	5.060021	61422.24	1	4.5	2	3
sp|Q61646|HPT_MOUSE	347	5.88004	38752.32	1	8.4	3	6
sp|Q61937|NPM_MOUSE	292	4.610011	32560.05	1	24.3	7	15
sp|Q64433|CH10_MOUSE	102	7.900086	10962.7	1	42.2	4	7
sp|Q6ZWN5|RS9_MOUSE	194	10.65015	22591.43	1	9.8	2	4

sp|Q78JT3|3HAO_MOUSE	286	6.090044	32804.31	1	19.2	5	8
sp|Q8C196|CPSM_MOUSE	1500	6.480053	164617.2	1	10.1	11	17
sp|Q8K2B3|DHSA_MOUSE	664	7.060067	72585.46	1	9.5	5	7
sp|Q8QZT1|THIL_MOUSE	424	8.700104	44816.14	1	7.1	2	3
sp|Q8VC28|AK1CD_MOUSE	323	6.660058	37057.8	1	26	6	12
sp|Q8VI36|PAXI_MOUSE	591	5.670035	64476.39	1	4.4	2	4
sp|Q91X83|METK1_MOUSE	396	5.510031	43508.66	1	7.6	3	7
sp|Q921I1|TRFE_MOUSE	697	6.940064	76723.88	1	4	2	3
sp|Q923D2|BLVRB_MOUSE	206	6.480053	22197.33	1	36.9	4	10
sp|Q99020|ROAA_MOUSE	285	7.680081	30831.27	1	11.2	2	6
sp|Q99J99|THTM_MOUSE	297	6.100045	33023.19	1	33	8	19
sp|Q99KB8|GLO2_MOUSE	260	6.490054	28901.02	1	20.8	3	5
sp|Q99PL5|RRBP1_MOUSE	1605	9.350119	172878.2	1	9.1	12	19
sp|Q9CPQ1|COX6C_MOUSE	76	10.13014	8469	1	19.7	2	3
sp|Q9CPU0|LGUL_MOUSE	184	5.240025	20809.6	1	15.2	2	3
sp|Q9CQB2|CP014_MOUSE	160	6.730059	17871.06	1	19.4	2	3
sp|Q9CRB9|CHCH3_MOUSE	227	8.5501	26334.52	1	11	3	4
sp|Q9CWS0|DDAH1_MOUSE	285	5.630034	31380.98	1	7	2	4
sp|Q9CY58|PAIRB_MOUSE	407	8.600101	44714.14	1	7.4	2	4
sp|Q9D819|IPYR_MOUSE	289	5.370028	32667.05	1	19.4	4	5
sp|Q9DBP5|KCY_MOUSE	196	5.680035	22165.33	1	37.2	7	11
sp|Q9DCX2|ATP5H_MOUSE	161	5.510031	18749.45	1	57.1	10	19
sp|Q9JHW2|NIT2_MOUSE	276	6.440053	30501.76	1	9.1	3	4
sp|Q9JMD3|PCTL_MOUSE	291	6.660058	32951.46	1	8.6	2	4
sp|Q9QXF8|GNMT_MOUSE	293	7.090067	32675.22	1	6.1	2	3
sp|Q9QXT0|CNPY2_MOUSE	182	4.940018	20767.35	1	15.9	2	2
sp|Q9R0H0|ACOX1_MOUSE	661	8.640102	74634.73	1	12.4	6	13
sp|Q9R0P3|ESTD_MOUSE	282	6.690058	31319.58	1	27.7	6	11
sp|P52760|UK114_MOUSE	135	8.730104	14255.42	0.9999	14.8	2	2
sp|Q9JLV1|BAG3_MOUSE	577	6.980065	61828.27	0.9999	5.4	2	2
sp|Q91YW3|DNJC3_MOUSE	504	5.600033	57464.1	0.9997	6	2	3
sp|Q921X9|PDIA5_MOUSE	517	7.250071	59267.26	0.9994	4.1	2	3
sp|P31786|ACBP_MOUSE	87	8.770105	10000.43	0.9991	12.6	2	3
sp|O09167|RL21_MOUSE	160	10.48015	18561.83	0.9989	18.1	2	2
sp|O35381|AN32A_MOUSE	247	3.979997	28537.53	0.9945	5.3	1	1
sp|O88668|CREG1_MOUSE	220	5.960042	24451.87	0.9945	5	1	3
sp|P01132|EGF_MOUSE	1217	6.050044	133144.3	0.9945	2.1	1	1
sp|P02089|HBB2_MOUSE	147	7.840085	15878.25	0.9945	12.9	1	3
sp|P14206|RSSA_MOUSE	295	4.790015	32838.08	0.9945	4.4	1	2
sp|P17751|TPIS_MOUSE	249	6.890063	26712.62	0.9945	6	1	1
sp|P21614|VTDB_MOUSE	476	5.380028	53600.41	0.9945	5.5	1	1
sp|P21619|LMNB2_MOUSE	596	5.400029	67318.12	0.9945	3.5	1	1
sp|P28667|MRP_MOUSE	200	4.620011	20165.43	0.9945	7.5	1	1
sp|P31725|S10A9_MOUSE	113	6.640057	13048.85	0.9945	10.6	1	3
sp|P36552|HEM6_MOUSE	443	8.800106	49714.58	0.9945	2.9	1	2
sp|P50247|SAHH_MOUSE	432	6.080044	47688.21	0.9945	2.5	1	1
sp|P62962|PROF1_MOUSE	140	8.460098	14957.21	0.9945	10	1	2
sp|P68037|UB2L3_MOUSE	154	8.670103	17861.58	0.9945	14.3	1	2
sp|Q4VAA2|CDV3_MOUSE	281	5.830039	29729.02	0.9945	10.7	1	1
sp|Q59J78|MIMIT_MOUSE	168	7.860085	19627.85	0.9945	10.7	1	1
sp|Q62048|PEA15_MOUSE	130	4.940018	15054.12	0.9945	7.7	1	2
sp|Q80XN0|BDH_MOUSE	343	9.140114	38284.98	0.9945	5.8	1	2
sp|Q8BG05|ROA3_MOUSE	379	9.090113	39652	0.9945	5.8	1	3
sp|Q8BH00|AL8A1_MOUSE	487	7.490077	53663.96	0.9945	2.5	1	1
sp|Q8BWT1|THIM_MOUSE	397	8.320095	41857.93	0.9945	6.5	1	1
sp|Q8CHT0|AL4A1_MOUSE	562	8.580101	61810.59	0.9945	2	1	2
sp|Q8R086|SUOX_MOUSE	546	6.060044	60755.93	0.9945	5.5	1	1
sp|Q8VDD5|MYH9_MOUSE	1960	5.540032	226370.1	0.9945	0.9	1	1

sp|Q8VE95|CH082_MOUSE	218	8.99011	24329.83	0.9945	5.5	1	1
sp|Q8VIJ6|SFPQ_MOUSE	699	9.450121	75441.9	0.9945	2.1	1	2
sp|Q920E5|FPPS_MOUSE	353	5.480031	40581.56	0.9945	4	1	2
sp|Q9CXI5|ARMET_MOUSE	179	8.340096	20373.68	0.9945	8.4	1	3
sp|Q9D0S9|HINT2_MOUSE	163	9.83013	17320.03	0.9945	12.3	1	2
sp|Q9DCS2|CP013_MOUSE	204	6.090044	22687.15	0.9945	8.8	1	2
sp|Q9JHI5|IVD_MOUSE	424	8.5201	46325.41	0.9945	2.6	1	4
sp|Q9Z2M7|PMM2_MOUSE	242	6.010043	27656.62	0.9945	5.4	1	2
sp|Q9CR51|VATG1_MOUSE	118	7.760083	13724.4	0.9939	9.3	1	2
sp|Q64471|GSTT1_MOUSE	240	6.790061	27376.25	0.9923	4.6	1	1
sp|P13634|CAH1_MOUSE	261	6.440053	28320.52	0.9912	3.8	1	2
sp|P16460|ASSY_MOUSE	412	8.350096	46584.52	0.9912	5.6	1	1
sp|O88569|ROA2_MOUSE	353	8.97011	37402.68	0.9901	4.2	1	2
sp|Q9WVA2|TIM8A_MOUSE	97	5.100022	11042.44	0.9879	11.3	1	2
sp|O35972|RM23_MOUSE	146	9.760128	17121.62	0.9874	10.3	1	2
sp|O35737|HNRH1_MOUSE	449	5.88004	49199.43	0.9868	4.1	1	1
sp|Q99PG2|OGFR_MOUSE	633	4.650012	70679.41	0.9831	1.9	1	1
sp|P63325|RS10_MOUSE	165	10.15014	18915.75	0.9815	5.5	1	3
sp|P62806|H4_MOUSE	103	11.36017	11367.34	0.9761	11.7	1	3
sp|P62991|UBIQ_MOUSE	76	6.560055	8564.843	0.9719	11.8	1	2
sp|P05202|AATM_MOUSE	430	9.120113	47411.4	0.9713	2.8	1	3
sp|P15532|NDKA_MOUSE	152	6.840062	17207.79	0.9703	7.9	1	2
sp|P16858|G3P_MOUSE	333	8.430098	35810.03	0.9692	4.5	1	1
sp|Q9CZL5|PHS2_MOUSE	103	6.270049	11740.28	0.9692	9.7	1	2
sp|P61957|SUMO2_MOUSE	95	5.310027	10871.22	0.9676	12.6	1	2
sp|Q9EQU5|SET_MOUSE	289	4.220002	33377.77	0.9671	4.5	1	1
sp|Q80Y14|GLRX5_MOUSE	152	6.090044	16292.49	0.9656	9.2	1	2
sp|P27546|MAP4_MOUSE	1125	4.890017	117429.1	0.9635	1.2	1	1
sp|Q9DAR7|DCPS_MOUSE	338	6.020043	38988.21	0.9593	5.6	1	2
sp|Q9CQI6|COTL1_MOUSE	142	5.270026	15943.91	0.9578	11.3	1	1
sp|Q8BTM8|FLNA_MOUSE	2647	5.680035	281191	0.9501	1	1	1
sp|O35490|BHMT1_MOUSE	407	8.010088	45020.53	1	22.9	8	18
sp|P01942|HBA_MOUSE	142	7.960087	15085.17	1	67.6	15	52
sp|P05366|SAA1_MOUSE	122	6.500054	13770.28	1	15.6	2	4
sp|P10649|GSTM1_MOUSE	218	7.710082	25969.98	0.9999	12.8	2	3
sp|P58771|TPM1_MOUSE	284	4.680012	32680.54	0.9995	16.2	3	5
sp|Q6IRU2|TPM4_MOUSE	248	4.640011	28467.71	0.9994	11.3	1	1
sp|P21107|TPM3_MOUSE	284	4.680012	32862.82	0.9861	16.2	1	1
sp|P70694|DHB5_MOUSE	323	8.490099	37047.68	1	15.2	4	5
sp|Q91Y97|ALDOB_MOUSE	364	8.5201	39506.98	1	33	16	30
sp|Q922U2|K2C5_MOUSE	580	7.580079	61766.7	1	5.5	3	7
sp|Q61414|K1C15_MOUSE	452	4.780015	49137.58	0.9996	4	2	2
sp|P60710|ACTB_MOUSE	375	5.290026	41736.76	0.9992	5.6	2	3