Electronic Supplementary Material (ESI) for Analytical Methods

Influenza A virus infection diagnosis infection based on DVD reader technology

María-José Bañuls, María-Victoria González-Pedro, Rosa Puchades and Ángel Maquieira*

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Figure S1. Scheme of the microarray design for Influenza

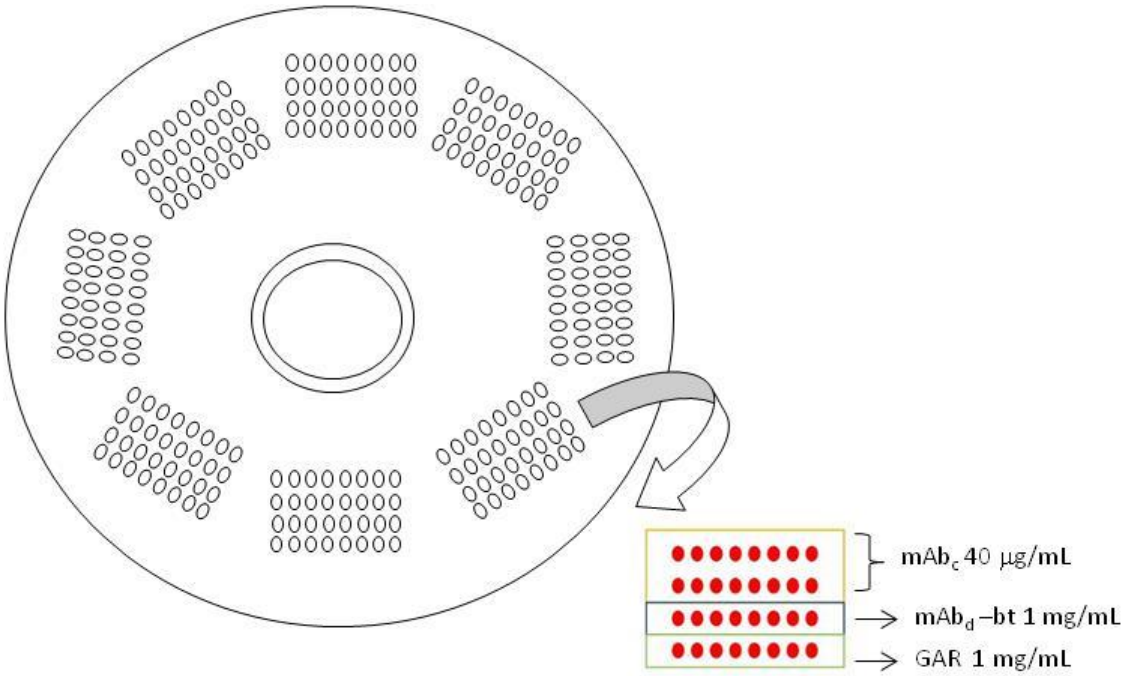
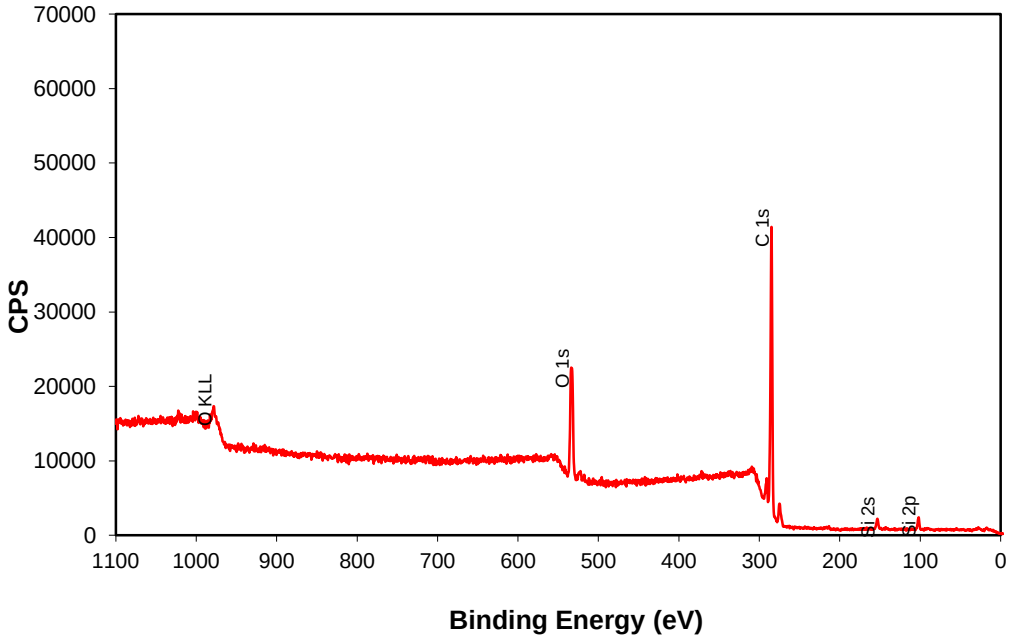
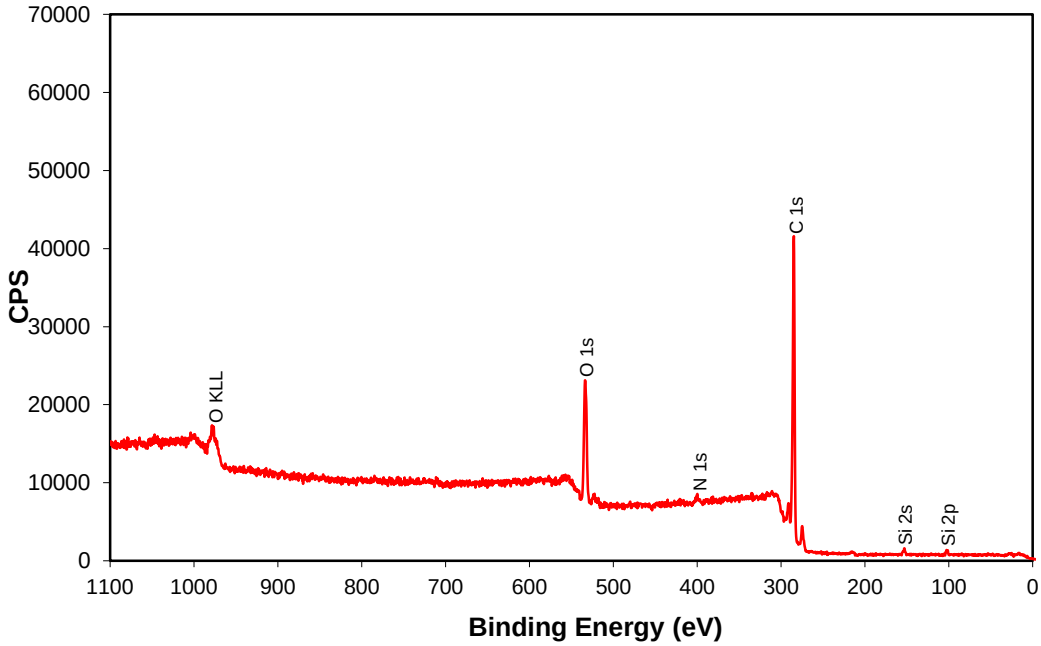


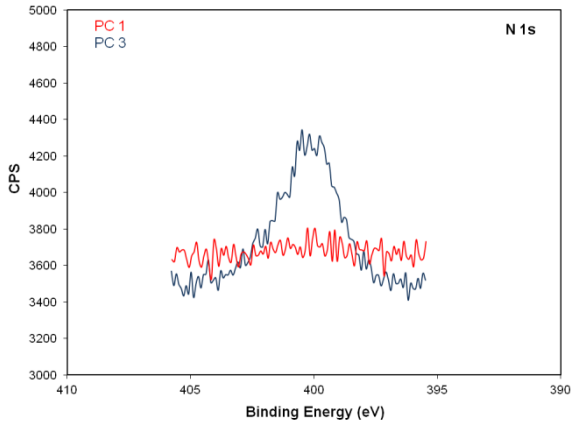
Figure S2. a) XPS global analysis for raw DVD (PC1) and aminated DVD (PC3) and b) comparation of N1s and O1s peak in both surfaces.

a)





b)



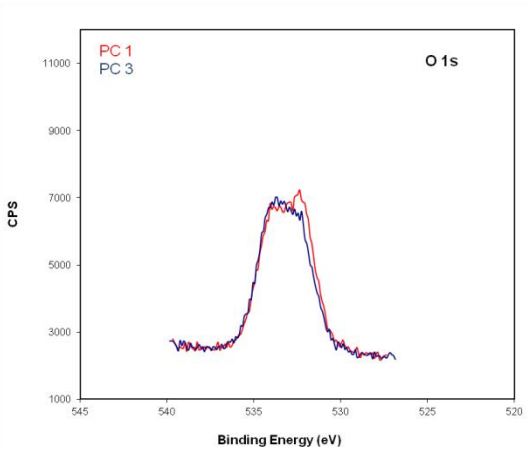


Figure S3. ATR-FTIR spectra (4000-3000 cm^{-1}) for raw DVD (PC1) and aminated DVD (PC3)

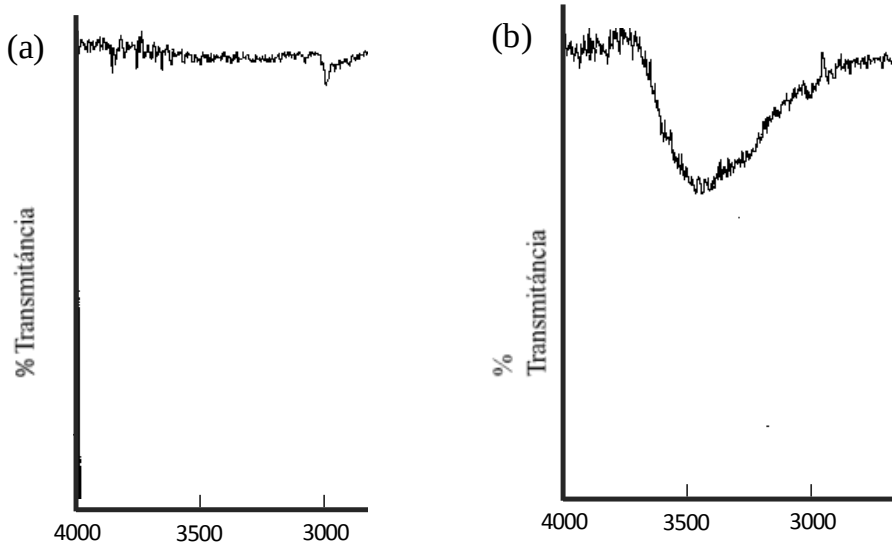


Figure S4. Calibration curve lineal range for different capture antibody concentrations.

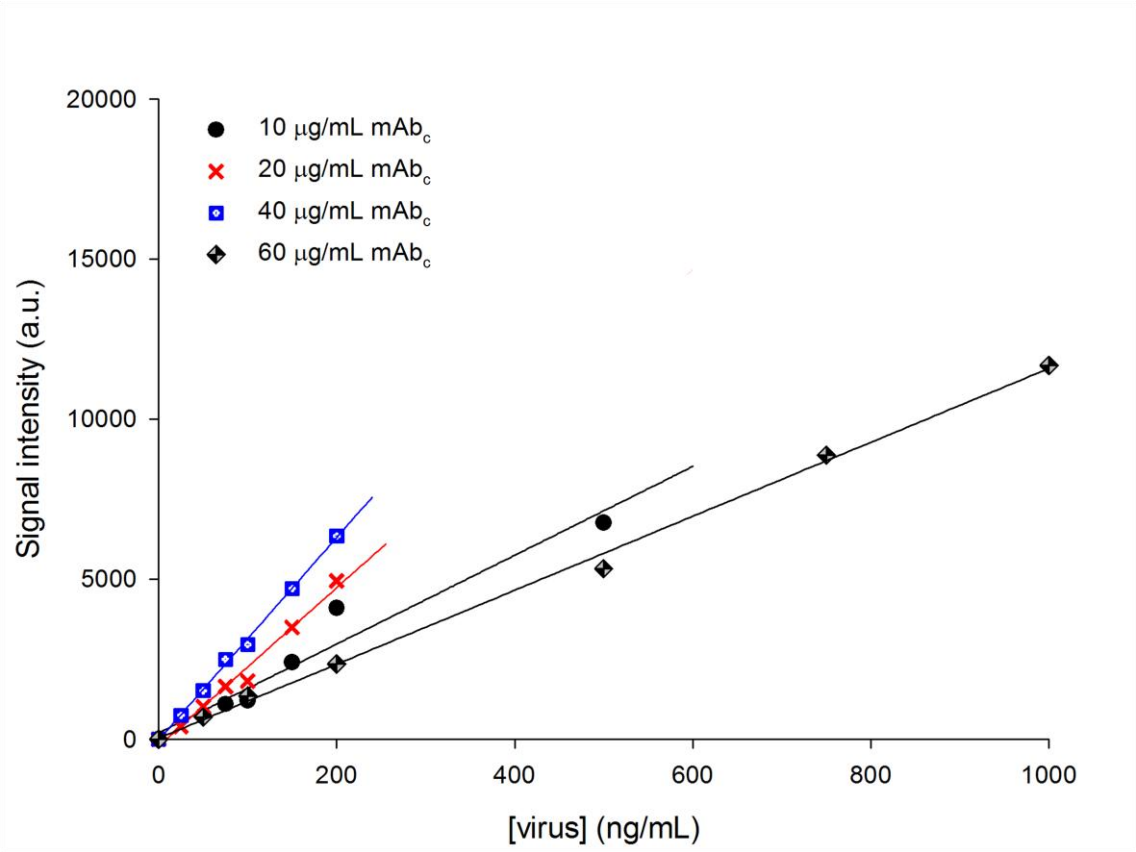


Table S1. Advantages and drawbacks of current immunocapture-based assays for *Influenza*

Detection principle	Advantages	Drawbacks
Microsphere flow cytometry	Good sensitivity (one order of magnitude greater that ELISA)	Expensive detection devices (15-45 k€) Assay time > 1.5 h
Micro-chip electrophoresis	Quick (10 min) Small sample amount	Expensive equipment (26 k€) Need for fluidics Long assay times
Interferometry	Label-free One-step Relatively quick (30 min after baseline stabilization)	Expensive chip Expensive detection platform (100 k€) Need for highly controlled working conditions Unstable measurements and poor precision Need for skilled personnel

Table S2. Data obtained from DPI for antibody immobilization and the further recognition of inactivated virus

Discrete Data	Input Data						Discrete Data Results			
Name	Time	Res Tm	Res Te	RII Value	Bulk Value	Reference	RI	Th (nm)	Mass (ng/mm²)	Density (g/cm³)
zero	0:59:16	-3,49989	0,9043	0,182	1,334808	zero	0	0		
after glut.	1:05:43	-2,59611	1,742442	0,182	1,334808	zero	1,526642	0,225759	0,237957189	1,054031317
before mAb 24 ppm	1:17:09	-2,70991	1,635951	0,182	1,334808	before mAb 24 ppm	0	0		
after mAb 24 ppm	1:22:39	-1,21214	2,909641	0,182	1,334808	before mAb 24 ppm	1,445794	0,61142	0,372852435	0,609813492
before ethanolamine	1:31:21	-1,3374	2,787425	0,182	1,334808	zero	1,467527	0,75006	0,546961478	0,729224111
after ethanolamine 2	1:47:33	-1,56581	2,617179	0,182	1,334808	zero	1,483261	0,606101	0,494382147	0,815676471
before virus 4.5 ppb	1:48:48	-1,59911	2,579253	0,182	1,334808	zero	1,478431	0,613736	0,484322335	0,789137754
after virus 4.5 ppb 2	1:55:52	-1,40336	2,721855	0,182	1,334808	zero	1,463365	0,748563	0,528750477	0,706354049
before virus 9 ppb	1:56:14	-1,40622	2,717645	0,182	1,334808	zero	1,462586	0,751611	0,527689128	0,702077475
after virus 9 ppb 2	2:01:43	-0,84637	3,148762	0,182	1,334808	zero	1,441291	1,127008	0,659380943	0,585071847
before virus 22.5 ppb	2:01:53	-0,85631	3,141034	0,182	1,334808	zero	1,441561	1,120159	0,657035156	0,586555035
after virus 22.5 ppb 2	2:07:25	-0,74264	3,238984	0,182	1,334808	zero	1,442212	1,161992	0,685727747	0,590130995
before virus 45 ppb	2:07:37	-0,75171	3,22998	0,182	1,334808	zero	1,441748	1,162761	0,68321537	0,587580018
after virus 45 ppb	2:12:10	-0,71199	3,270615	0,182	1,334808	zero	1,444363	1,153592	0,694402906	0,601948528
before virus 90 ppb	2:14:44	-0,85123	3,157218	0,182	1,334808	zero	1,446212	1,079009	0,660469493	0,612107333
after virus 90 ppb 2	2:22:36	-0,58579	3,365497	0,182	1,334808	zero	1,439975	1,252553	0,723771854	0,577837321
End	2:23:13	-0,60246	3,358749	0,182	1,334808	End	0	0		

Discrete Data	Input Data						Discrete Data Results			
Name	Time	Res Tm	Res Te	RII Value	Bulk Value	Reference	RI	Th (nm)	Mass (ng/mı	Density (g/cm³)
zero	0:59:16	-0,32685676	-2,64977241	0,182	1,33485062	zero	0	0		
after glut.	1:05:43	0,51577973	-1,91238117	0,182	1,33485062	zero	1,47161748	0,28520889	0,21432485	0,751466234
before mAb 4.8 ppm	1:09:28	0,4501085	-1,97705078	0,182	1,33485062	before mAb	0	0		
after mAb 4.8 ppm	1:15:08	1,12613463	-1,41942799	0,182	1,33485062	before mAb	1,4184593	0,35990219	0,16533487	0,459388337
before ethanolamine	1:31:21	1,06633162	-1,48682737	0,182	1,33485062	zero	1,42920547	0,66324845	0,34385005	0,518433251
after ethanolamine	1:41:25	1,16778493	-1,3913343	0,182	1,33485062	zero	1,43688786	0,66172409	0,37099175	0,560644159
after ethanolamine 2	1:47:33	1,11458337	-1,42962801	0,182	1,33485062	zero	1,44170627	0,61142044	0,35897651	0,587118925
before virus 4.5 ppb	1:48:48	1,10866964	-1,43338621	0,182	1,33485062	zero	1,44241852	0,60532303	0,35776551	0,59103238
after virus 4.5 ppb	1:53:30	1,38286531	-1,17524159	0,182	1,33485062	zero	1,45854734	0,63428574	0,43109376	0,679652297
after virus 4.5 ppb 2	1:55:52	1,30263042	-1,24570274	0,182	1,33485062	zero	1,457684	0,60837174	0,41059536	0,674908669
before virus 9 ppb	1:56:14	1,29498494	-1,25118876	0,182	1,33485062	zero	1,4584061	0,60227432	0,40886974	0,678876259
after virus 9 ppb	2:00:42	1,66292548	-0,92930663	0,182	1,33485062	before virus	1,47136277	0,72742615	0,50274197	0,750066763
after virus 9 ppb 2	2:01:43	1,59570599	-0,99398345	0,182	1,33485062	before virus	1,45182726	0,71980439	0,48440969	0,642728775
before virus 22.5 ppb	2:01:53	1,59038329	-0,99966604	0,182	1,33485062	zero	1,45671213	0,7211935	0,48288862	0,669568726
after virus 22.5 ppb	2:06:22	1,81240189	-0,78853899	0,182	1,33485062	zero	1,4665306	0,75006861	0,54268693	0,723516386
after virus 22.5 ppb 2	2:07:25	1,7475152	-0,84538484	0,182	1,33485062	zero	1,46637843	0,72799337	0,52610643	0,722680252
before virus 45 ppb	2:07:37	1,73726881	-0,85380536	0,182	1,33485062	zero	1,46658133	0,72342133	0,5236088	0,723795078
after virus 45 ppb	2:12:10	1,78889453	-0,80035704	0,182	1,33485062	zero	1,47085712	0,72035581	0,53831359	0,747288469
after virus 45 ppb 2	2:14:26	1,70146382	-0,88037777	0,182	1,33485062	zero	1,46888343	0,69981187	0,51537224	0,736443984
before virus 90 ppb	2:14:44	1,69230843	-0,88999724	0,182	1,33485062	zero	1,4680515	0,70057818	0,51273423	0,73187296
after virus 90 ppb	2:19:22	1,99880481	-0,61700004	0,182	1,33485062	zero	1,47085907	0,79190546	0,59179028	0,747299156
after virus 90 ppb 2	2:22:36	1,85168004	-0,74604762	0,182	1,33485062	zero	1,47070345	0,7424309	0,55418317	0,746444106
End	2:23:13	1,84885168	-0,75175673	0,182	1,33485062	End	0	0		

Table S3. Linear regression fits ($y = y_o + kx$) and detection limit (calculated from the interpolation of 3-fold the blank standard deviation) for 10, 20, 40 and 60 μg/mL of mAb_c

mAb_c (μg/mL)	y_o	k (mL/ng)	R^2	D.L. (ng/mL)	Linear range (ng/mL)
10	200.08	13.87	0.95	39	0-500
20	-217,58	24.7	0.98	44	0-200
40	-29,76	31.7	0.998	29	0-200
60	33.09	11.5	0.997	132	0-1000