

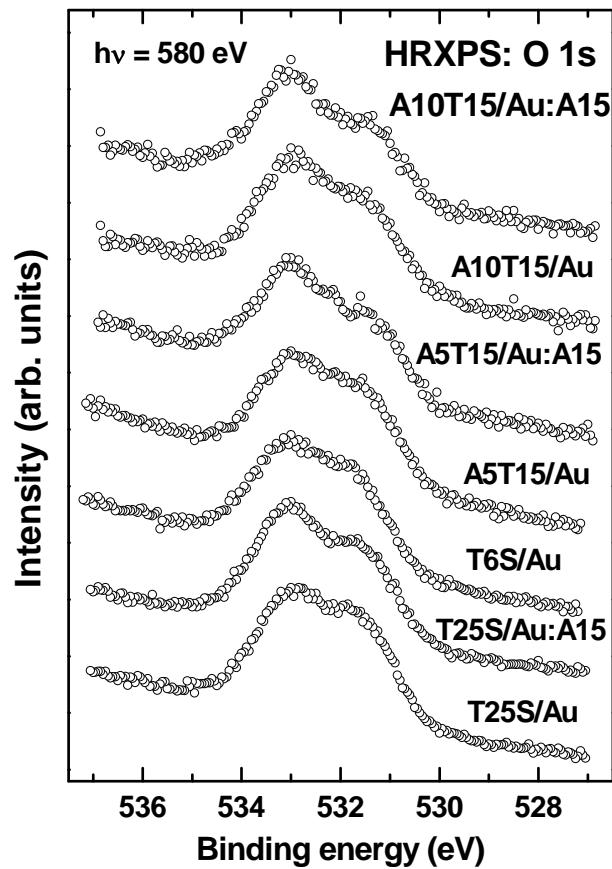
## Supporting Information

### Hybridization in DNA films – a multi-technique spectroscopy study

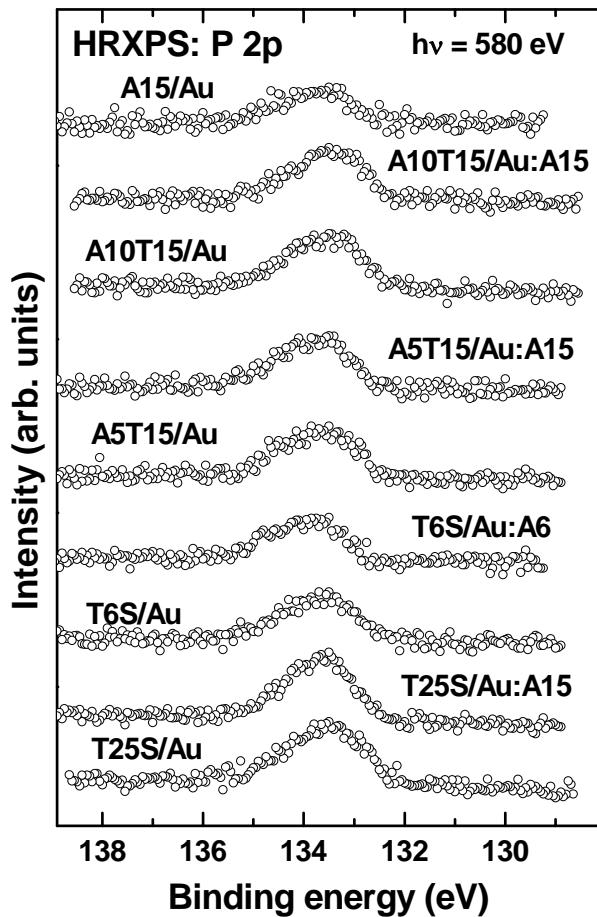
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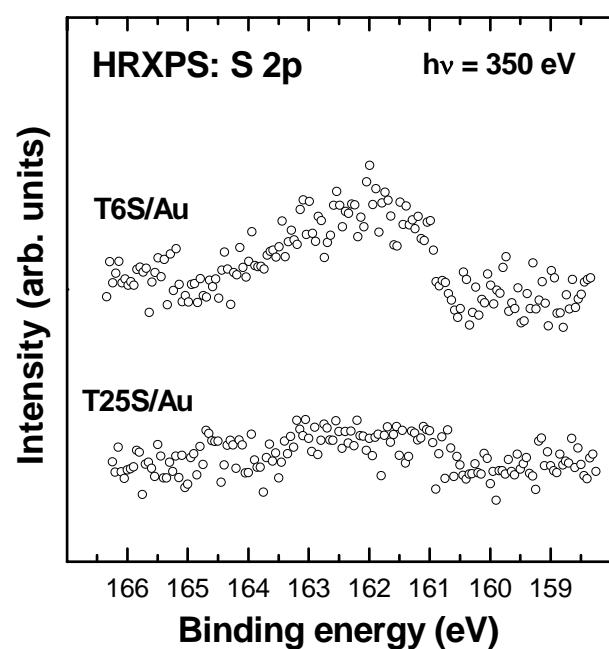
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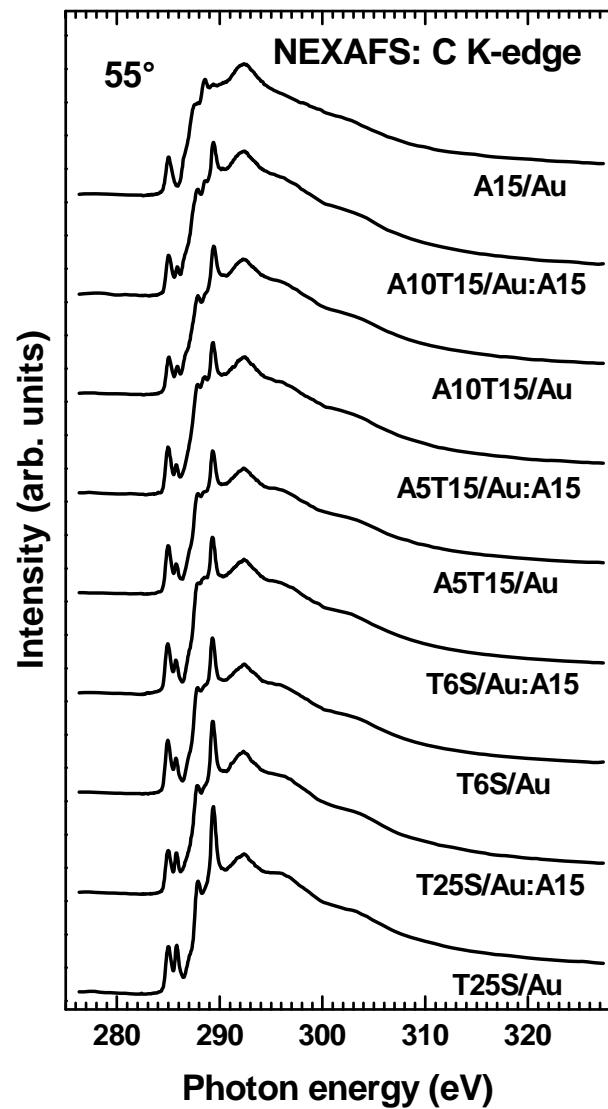
**Figure S1.** O 1s HRXPS spectra of the ssNDA films before and after the hybridization step.



**Figure S2.** P 2p HRXPS spectra of the ssNDA monolayers before (black) and after (red) the hybridization step.



**Figure S3.** S 2p HRXPS spectra of T6S/Au and T25S/Au.



**Figure S4.** C K-edge NEXAFS spectra of the ssNDA films and reference A15/Au before and after the hybridization step. The spectra were acquired at an X-ray incidence angle of 55°.

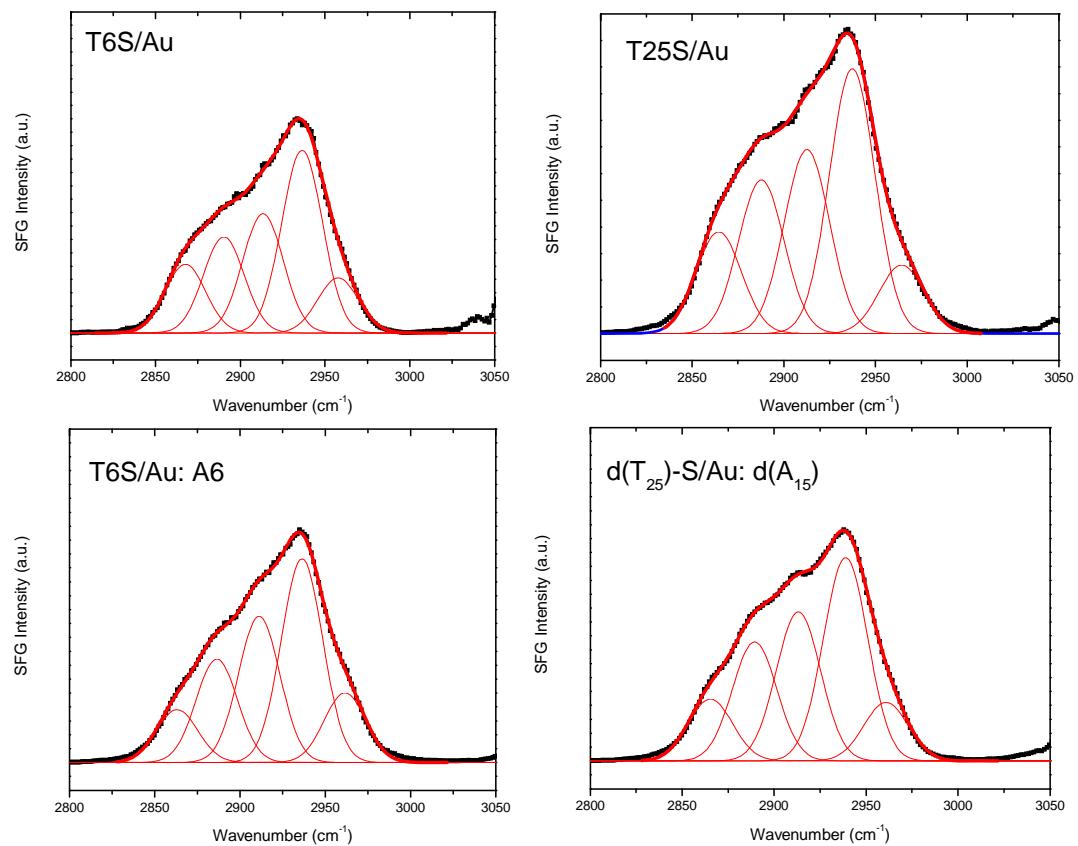
**Table 1.** Positions and intensities of the peaks in the SFG spectra of hybridized and unhybridized ssDNA films.

(dT)6-S/Au					
Unhybridized			Hybridized		
Peak	Intensity		Peak	Intensity	
Position	Intensity	Ratio	Position	Intensity	Ratio
2867	0.39	0.38	2863	0.29	0.26
2890	0.54	0.52	2886	0.57	0.51
2913	0.70	0.68	2911	0.80	0.72
2936	1.03	1.00	2936	1.11	1.00
2957	0.31	0.30	2961	0.38	0.34

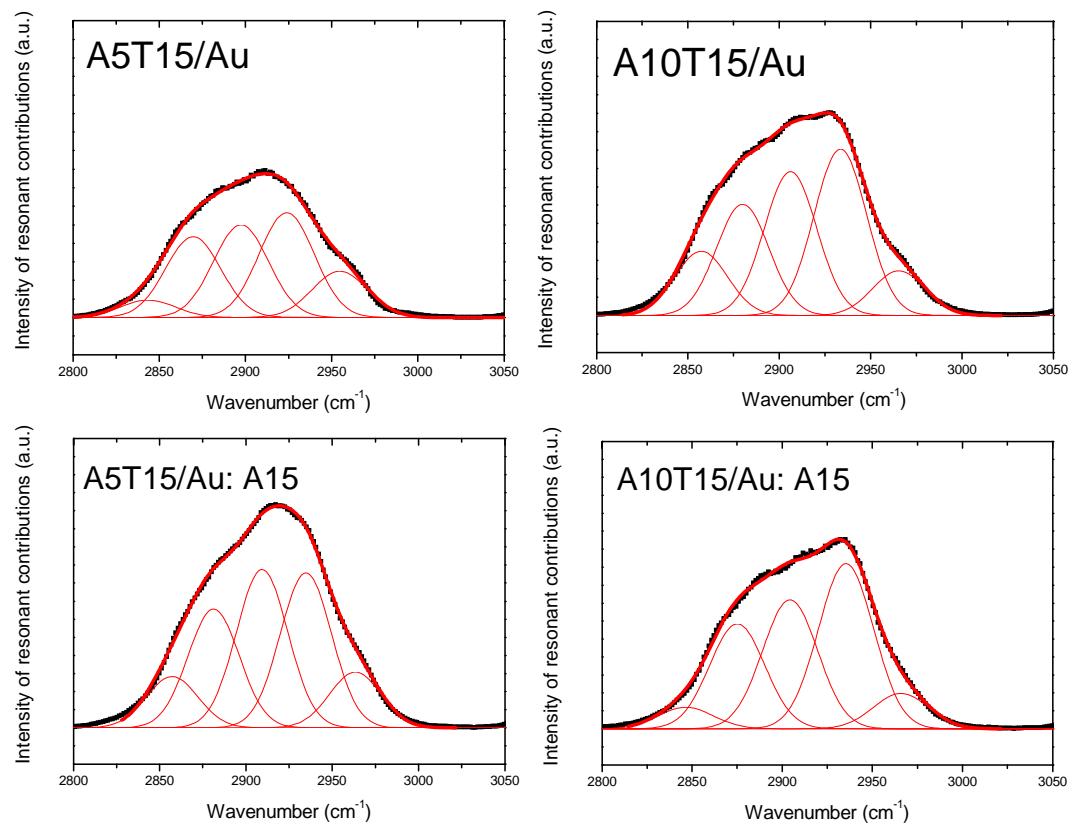
(dT)25-S/Au					
Unhybridized			Hybridized		
Peak	Intensity		Peak	Intensity	
Position	Intensity	Ratio	Position	Intensity	Ratio
2964	0.60	0.39	2865	0.33	0.30
2887	0.89	0.58	2889	0.65	0.59
2912	1.07	0.69	2913	0.81	0.74
2937	1.54	1.00	2938	1.10	1.00
2964	0.40	0.26	2960	0.32	0.29

d(T15-A5)/Au					
Unhybridized			Hybridized		
Peak	Intensity		Peak	Intensity	
Position	Intensity	Ratio	Position	Intensity	Ratio
2843	0.09	0.16	2857	0.26	0.33
2869	0.44	0.77	2881	0.61	0.76
2897	0.50	0.88	2909	0.82	1.03
2923	0.57	1.00	2934	0.8	1.00
2954	0.25	0.44	2963	0.29	0.36

d(T15-A10)/Au					
Unhybridized			Hybridized		
Peak	Intensity		Peak	Intensity	
Position	Intensity	Ratio	Position	Intensity	Ratio
2857	0.31	0.38	2846	0.11	0.13
2879	0.54	0.66	2875	0.56	0.64
2906	0.70	0.85	2904	0.69	0.78
2933	0.82	1.00	2935	0.88	1.00
2965	0.22	0.27	2965	0.19	0.22



**Figure S5.** Resonant SFG contributions of the  $d(T)$ -S/Au films before (above) and after (below) hybridization, with fitted peaks.



**Figure S6.** Resonant SFG contributions of the d(A-T)/Au films before (above) and after (below) hybridization, with fitted peaks.