# Light driven colloidal aggregation at a liquid-liquid interface

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We present a new 'perfect' oil-water interface, to which we can attach colloids reversibly via DNA [1]. Taking care that these DNA anchored particles behave like an equilibrium colloidal gas at this liquid-liquid interface, we show that we can make them aggregate in the presence of an optical tweezers focus placed at the interface. Playing with the trapping strength of the tweezers we obtain either a liquid 2D-droplet or a 2D-crystal. Using video analysis we can probe the forces exerted by the trap as function of its strength and its topography. Moreover we probe the pair-wise interactions between the surface anchored particles using micro-rheology and the 'blinking-trap' method [2, 3]. Finally, we will present also data on how these forces when depletion attractions are introduced.

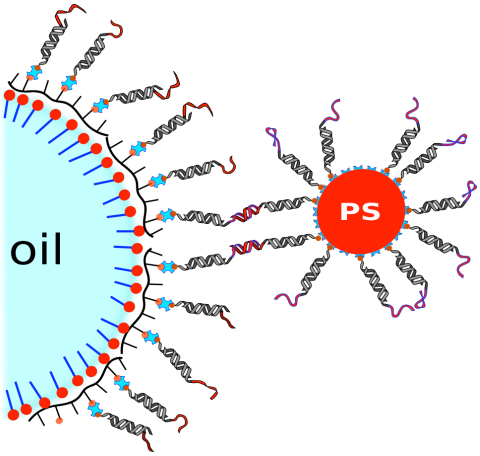


**Figure:** Not to scale, schematic representation of the DNA-functionalized 20-30μm large oil droplets (ODs) to which 0.5 μm large polystyrene (PS) particles, coated with the complementary DNA, bind from solution. The ODs are stabilized with sodium dodecyl sulphate (SDS) and the DNA is attached to the ODs via a positively charged comb-like polymer. The colloids can diffuse freely on the OD, but do not fall off below the DNA's melt temperature.

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