

## **Multivalent "attacker & guard" strategy for selectively targeting surfaces with low receptor density**

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Abstract: Multivalent particles competing for binding on the same surface can exhibit switch-like behaviour, depending on the concentration of surface receptors [1]. At low receptor concentration, energy dominates the free energy of binding, and particles having a small number of strong-binding ligands preferentially bind to the surface. At higher receptor concentration, multivalent effects become significant, and entropy dominates the binding free energy; particles having many weakly-binding ligands preferentially bind to the surface.

I will describe how we can exploit this physical principle, to define a multivalent "attacker" and "guard" recipe that targets surfaces with *low* receptor density (among other competing high-density surfaces). This is the challenging complimentary case to standard multivalent superselective binding, in which high receptor density surfaces are targeted. Molecular theory and simulation will be used to identify microscopic design guidelines for achieving this goal in practise.

[1] Tito, N. B.; Frenkel, D. Switch-like surface binding of competing multivalent particles. *Eur. Phys. J. Special Topics* 2016, 225, 1673.