

Specific Wetting Pattern Probed With Biomimetic Droplets

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Amongst the wide topics relative to the study of cell-cell adhesion, one important advance concerns the existence of an auto-organization of ligand-receptors couples at contact [1]. Although active transport processes are known to participate to the patterns construction, it has been shown that in some cases passive processes only are able to trigger this patterning. Some patterning is also reported with biomimetic systems: vesicles bearing both ligands and repellers, wetting a substrate coated by receptors reveal that mobile binders can collapse into very dense patches instead of spreading homogeneously over the full contact [2]. In this article, we give evidence for a different scenario of specific wetting, which also exhibits some auto-organization of ligands receptors complexes. By using emulsions as biomimetic systems, we show that the non-specific ligand-repeller affinity cooperate with the specific ligand-receptor affinity in a two steps mechanism of recruitment. Non-specific affinity ensures a fast and homogeneous recruitment and organization of mobile ligands at contact, while specific recognition further set the adhesive energy.

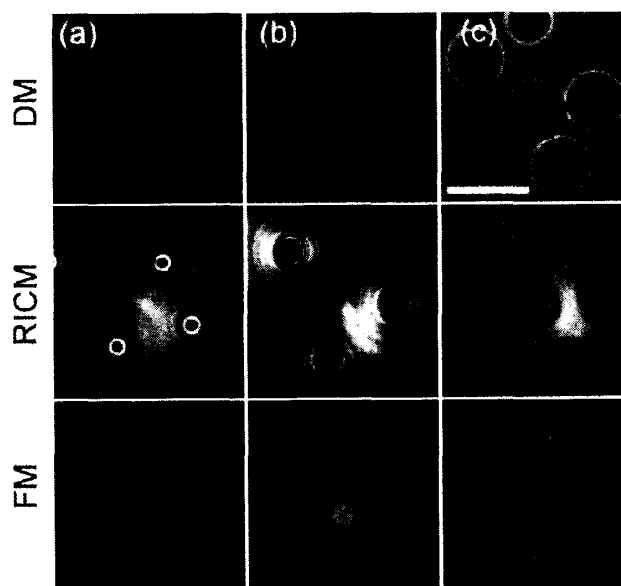


Figure 1: Direct transmission microscopy (DM), RCM and epifluorescence microscopy (FM) pictures of emulsion droplets coated with streptavidin and adhering on functionalized glass coverslips. (a) The PEG density is high and no biotin are present: the droplets adhere, as shown by the existence of a black contact zone on the RCM picture, and a recruitment of streptavidins occurs; (b) the substrate has the same overall PEG surface density but some biotins are present: an homogeneous fluorescent contact zone exist, and the contact angle increases as compare to the precedent case; (c) the overall PEG surface concentration and the surface biotin concentration have been reduced by a factor 2 as compared to case (b): the contact angle is the same, but the final distribution of fluorescence has a ring-like shape, with an almost depleted disk in its center.

Refereces

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- 2) R. Bruinsma, A. Behrisch and E. Sackmann, Phys. Rev. E **61** (2000), 4253.

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