

AFM imaging of membrane proteins reconstituted into artificial membranes

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Membrane proteins represent about 25% of the open-reading frames of the human genome but, despite their biological importance, their structure is poorly documented. This situation is mainly explained by the difficulty to overexpress in large amount the recombinant proteins, especially for eukaryotic origin, and to stabilize them after solubilization and purification in detergents. In this difficult context, AFM appears as a very promising tools thanks to its outstanding vertical and lateral resolution on biological membranes allowing subnanometer details on extracellular domains of proteins to be delineated [1]. Here I will focus on recent techniques of incorporation of purified proteins into artificial membranes allowing AFM imaging (reviewed in [2]). The different techniques will be compared in terms of protein density, amount of protein per incorporation trial, simplicity and versatility. Developments of these techniques in the nanobiotechnology field will be also addressed.

References

- [1] Müller DJ, Sapra KT, Scheuring S, Kedrov A, Frederix PL, Fotiadis D, Engel A. (2006) Single-molecule studies of membrane proteins. *Curr Opin Struct Biol.* 2006 Aug;16(4):489-95.
- [2] - B. Seantier, M.C. Giocondi, C. Le Grimellec, and P.-E. Milhiet (2008) Probing Supported Model and Native Membranes using AFM. *Current Opinion in Colloid and Interface Science*, in press.