" Functional anchoring of proteins on modified surfaces: from bacterial cytoskeleton to redox proteins"

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I will present recent work developed in my lab in which we have addressed the study of different membrane-associated proteins. We have used Quartz Crystal Microbalance (QCM) and Atomic force Microscopy (AFM) to characterize the structure and dynamic behavior of membrane-associated bacterial cytoskeletal protein FtsZ. This GTP-dependent self-organizing protein plays a central role in bacterial cell division. The high-resolution information obtained has been used in multiscale theoretical models that propose a force generation mechanism. I will also present recent work on orienting and immobilizing different membrane-associated redox and respiratory proteins on gold electrodes. We monitor enzymatic activity and the accompanying proton gradient formed across a supported lipid membrane. We use a combination of surface modification techniques to construct a modified electrode in which hydrogen consumption is coupled to ATP synthesis.

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