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Biomolecular Adsorption and the LIFE Detector

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In recent years there has been a growing interest in developing systems for detecting very low concentrations of organic and biological molecules. The hope of finding an abnormality at its earliest stage of formation in the human body, the need to identify carcinogens in the environment, and the need to verify the deployment of biological and chemical warfare agents have provided the impetus for this research. We are studying the coverage and the adherence of biological macromolecules on field-emitter tips in order to investigate a new detector concept which is based on immunologic specificity and the ability of the field-electron emission process to detect single molecules. Transmission electron microscopy and field-ion tomography are being used for this task. This talk will review our present understanding of biomolecular adsorption on metals and how a combination of immunochemistry and field-electron emission could provide a unique molecular detector with unparalleled sensitivity and chemical specificity.

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