



SACRAMENTO
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Department of Physics and Astronomy

Physics & Astronomy Colloquium

Fall 2011

Optical Biosensing: using polarized light to map the machinery of life

Optical instrumentation has long been important to life and medical science, beginning with optical microscopy and continuing to, for example, DNA sequencers. Researchers have traditionally isolated the “machinery of life” (for example, macromolecules like proteins and nucleic acids) in vitro and tinkered with them to determine how they work. However, researchers are finding it useful study large collections of biomolecules simultaneously to better understand how their interactions lead to biological functions and new technical or clinical uses. Given a library of biomolecules, one wishes to identify what binds with what, quantify the reaction kinetics and binding strengths, and to do this rapidly and efficiently. An optical biosensor monitors a biochemical reaction by measuring how light interacts with the biomolecules and how this interaction changes with time. Our group has developed an optical biosensor based on reflecting polarization-modulated laser light from a glass slide at oblique incidence. The polarization of the reflected light changes in a way dependent upon the amount of biomolecules attached to the glass. We have constructed automated scanning microscopes using this method to study up to 12,000 different biochemical reactions simultaneously, allowing us to add more detail to the map of the machinery of life.

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Thursday, September 29, 2011

4:00-5:20 PM - MND 1015

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