

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Aptamer functionalized lipid multilayer gratings for label free detection of specific analytes PLENGCHART PROMMAPAN, Department of Physics, Florida State University, TROY W. LOWRY, Department of Physics and Integrative Nanoscience Institute, Florida State University, DAVID VAN WINKLE, Department of Physics, Florida State University, STEVEN LENHERT, Department of Biological Sciences and Integrative Nanoscience Institute, Florida State University — Lipid multilayer gratings have been formed on surfaces with a period of 700 nm. When illuminated with white light incident at about 50° , these gratings diffract green light perpendicular to their surface. We demonstrate the potential of these gratings as sensors for analytes by monitoring changes in the diffracted light due to the changes in the size and shape of the grating in response to analyte binding. To demonstrate this potential application, a lipid multilayer grating was functionalized with a thrombin binding aptamer. The selectivity of our aptamer functionalized lipid gratings was confirmed both by monitoring the diffracted light intensity and by fluorescence microscopy. Furthermore, the results show that the binding activity between the aptamer and thrombin depends on the relative composition of a zwitterionic lipid (DOPC) and a cationic lipid (DOTAP). This work shows that nanostructured lipid multilayers on surfaces are a promising nanomaterial for label-free bio-sensing applications.

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Date submitted: 14 Nov 2014

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