

#### 4.1.5 LASERS SHINE LIGHT ON BIOCHIP FUNCTION

F. C. Boman, M. J. Musorrafiti, J. M. Gibbs, B. R. Stepp, A. M. Salazar, S. T. Nguyen, F. M. Geiger, "DNA Single Strands Tethered to Fused Quartz/Water Interfaces Studied by Second Harmonic Generation," *J. Am. Chem. Soc.*, **2005**, *127*, 15368–15369.

DNA forms the basis of all life processes and has become a promising foundation for building ultrasensitive biodetection devices. However, the current chemical modification methods used for DNA detection are time intensive and expensive. In this work NU-NSEC researchers have shown how nonlinear optics (e.g., lasers) can be used to study DNA molecules. The phosphate groups on the DNA backbone serve as intrinsic labels that do not require chemical modification other than surface attachment. This approach is broadly applicable for the investigation of DNA during its interaction with biological targets, as well as charged biopolymers in general, and has important implications for predicting and controlling macromolecular interactions, improving biodiagnostics, and understanding life processes.

