

**Development of biologically active organic
nanotransducers**

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Polyaniline is a conducting polymer with great potential in the emerging field of organic electronics. Recent studies have shown that the electrical properties of polyaniline can be improved by polymerization in various organic acids under controlled environmental conditions. Most polyaniline syntheses are carried out with aniline monomer and dilute hydrochloric acid. This paper will describe the: (1) use of alternative protonating acids in the polymerization process, (2) conjugation of the organic polymers with antibodies to form biologically active molecular transducing systems, and (3) performance of the biologically active nanotransducers in a biosensor platform for detecting pathogenic bacteria and viruses. Sheet resistance, conductivity in water, pH, and physical structures of the nanotransducers will be presented. Performance of the biosensors using these nanotransducers will be demonstrated for bacteria and viruses of concern to homeland security, food safety, and environmental integrity.