The Nugen Research Group has been developing rapid methods for the detection of pathogenic bacteria.

The goal of the project is to produce a low-cost device which is able to perform complex reactions. The capillary-flow microfluidic device incorporated electrowetting valves and electrochemical detection. This allowed automated and timed reagent delivery during the reaction.

The final device was able to electrochemically detect $1 \times 10^5$ bacteriophage which resulted from an initial $1 \times 10^3$ E. coli.

**Professor Sam R. Nugen**  
*University of Massachusetts*