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ABSTRACT: The importance of rapid diagnostic tools for point of care and point of service applications can’t be understated in the post-pandemic world. While various methods are available for first level identification of pathogens for clinical applications, electrochemical biosensors provide some unique advantages with respect to cost, ease of use, rapid detection capability and low detection limits. This seminar will focus on the development of electrochemical diagnostic methods for broad range of biomedical applications. The first type of sensor is a DNA-based diagnostic method for detection of cancer biomarkers in clinically-relevant samples. The second type is a virus-based selective electrochemical detection of pathogenic bacterial cells in food and clinically-relevant sample matrices.