Rapid and comprehensive assessment of abnormalities in blood coagulation at the point-of-care (POC) is important for patients who are severely injured, on anticoagulation therapy or have a congenital bleeding disorder. Laboratory and in-hospital coagulation tests may not be available in a timely manner and extant POC tests do not provide information on the complete blood coagulation process. In this talk, I will present the development of novel dielectric microsensor, termed ClotChip™, which is based on the electrical technique of dielectric spectroscopy for rapid, comprehensive assessment of whole blood coagulation at the POC using less than a drop of blood. The ClotChip™ features a three-dimensional, parallel-plate, capacitive sensing structure with a floating electrode integrated into a microfluidic channel, and permittivity measurements of whole blood at 1MHz are shown to provide information on multiple aspects of the blood coagulation process. The presentation will include data from several pilot clinical studies, commercialization of the ClotChip™ system, and future directions for POC assessment of hemostasis using miniaturized dielectric coagulometry.

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