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Abstract

The rising research interest in personalized medicine promises to revolutionize traditional medical practices. This presents a tremendous opportunity for developing wearable devices toward predictive analytics and treatment [1–3]. In this talk, I will introduce our efforts in developing wearable biosensors for non-invasive molecular analysis. Such wearables can autonomously access body fluids (e.g., human sweat) across the activities and continuously measure a broad spectrum of analytes including metabolites, nutrients, hormones, proteins, and drugs [4–10]. Laser engraving and inkjet printing are used to manufacture high-performance nanomaterials-based biosensors at large scale and low cost [6,7]. The clinical value of our wearable systems is evaluated through various human trials toward precision nutrition, stress/mental health assessment, chronic disease management, and drug personalization [4–10]. I will also discuss our research progress on energy harvesting from the human body and the environment to realize battery-free wireless wearable sensing [11–13]. These wearable technologies could open the door to a wide range of personalized monitoring, diagnostic, and therapeutic applications.

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