

Fabrications of Wearable, Wireless Sensors

Stretchable and Transparent Sensors

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This Healthcare applications of wearable and smart sensors which can monitor human health conditions noninvasively with function of wireless transmission have attracted substantial interests due to the capability of direct detection of biomarkers contained in body fluids. However, the transparent and stretchable sensors integrated on the biomaterials are not yet been realized. In this talk, we presented a multifunctional sensor for human disease diagnosis based on a RLC circuit, where R (resistance) responds to molecular binding of biomarkers in the body fluid while L (inductive) and C (capacitance) change in accordance with structural changes of capacitance materials induced by varying pressure. This device based on hybrid nanostructures using two-dimensional graphene and one-dimensional metal nanowire exhibited high transparency, superb stretchability, and hence enabled the device to be fittable on biomaterials with wireless sensing capability. Furthermore, *in-vivo* and *ex-vivo* tests demonstrated its reliable operation. The advance of these electronics using hybrid structures provides a route towards future electronics.

Keywords—wearable electronics, stretchable electronics, transparent electronics, internet of things

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Jang-Ung Park achieved his Ph.D. from University of Illinois at Urbana-Champaign (UIUC) in 2009. After that, he went on to work as Postdoctoral Fellow at Harvard University. He is now an Associate Professor in School of Materials Science and Engineering at UNIST. His current research is focused on nanomaterials synthesis and wearable electronics.