

Graphene-based epidermal sensor system (GESS) with total thickness below 500 nm. The GESS is manufactured by the cost-effective and rapid “cut-and-paste” method on tattoo paper and can be directly laminated on human skin like a temporary transfer tattoo. Without any tape or adhesive, the GESS completely conforms to the microscopic morphology of human skin via van der Waals interaction. The softness and transparency of the GESS, make it the world's first epidermal sensor system that is invisible both mechanically and optically. The GESS has been successfully applied to measure electrocardiogram (ECG), electroencephalogram (EEG) and electromyogram (EMG) with signal-to-noise ratio comparable with commercial electrodes, in addition to skin temperature and skin hydration. The thin and transparent graphene epidermal sensor can be used for the first time enable simultaneous electrical and optical epidermal sensing.

Huang KT, Penn DL, Chi JH. A Soft, Epidermal Sensor for Noninvasive, Wireless Assessment of Shunt Flow. [Neurosurgery](#). 2018 Dec 27. doi: 10.1093/neuros/nyy627. [Epub ahead of print] PubMed PMID: 30590750 ¹⁾.

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