

## **Nanoinnovation in biosensing: Label-free Organic Biosensors for Diagnostics**

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Organic electronic biosensors are rapidly emerging as a solid alternative to state-of-the-art methods in biosensing, including optical sensors. In particular, Electrolyte Gated Organic Transistors (EGOTs) combine the advantages of organic electronic devices (cost effective fabrication with high throughput technologies also on flexible and wearable substrates, ease of miniaturization, biocompatibility) to those offered by electrolyte gating, namely low power consumption, label free response, operation in liquid. I will present some of the most recent examples of EGOT-based biosensors developed by our group for a number of health-relevant biomarkers ranging from small molecules such as uric acid to proteins (cytokines) and even viruses. Moreover, I will show examples of how materials strategy at the nanoscale might be used to endow EGOT with selectivity and ultra-high sensitivity, with a focus on the use of dual-ionic-layer hydrogel membrane and of protein/carbon nanotubes adducts for green, facile fabrication of electronic biosensors.