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Thin, fast and edible electronics for future biosensing and bioactuating systems

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Printed organic transistors have been considered for many novel applications towards large area and flexible electronics, since they can enable pervasive integration of electronic functionalities in all sorts of appliances, their portability and wearability. Their electrolyte gated version is largely studied and developed as a base for highly sensitive biosensors. Here I will first report on our recent work on the use of printing to enable cost-effective biosensing platforms with carbon-based semiconductor. Then I will provide an overview on our current efforts in making printed organic electronics (i) ultrathin, to enhance as much as possible conformability thus enabling robust wearable systems; (ii) fast switching, to enable more applications at Radio-Frequencies and in particular wireless sensors and biosensors; (iii) edible, towards electronics systems made with non-toxic, ingestible materials, serving smart pharmaceuticals and food-tagging applications.