Nanometric-thin freestanding polymeric films for soft micro-electronics

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Soft electronics is a new emerging exciting field of study, targeting seamless integration of electronics components and devices into non-rigid non-planar complex surfaces and objects. Among others, a particularly promising approach to soft electronics is based on the use of organic and solution process based technologies, trough the development of free-standing conformable circuits made of ultra-thin (tens of nanometers) films of various polymers [1], directly transferrable on skin ("tattoo electronics") [2] or other complex surfaces. In the first part of the talk will review recent achievement of our group in this field, toward future applications in personal unperceivable healthcare monitoring devices [3], active tattoo (Figure 1.a) and ultra-conformable printed electronic systems [4]. In the second part of the talk I'll move from 2D to 3D plastic devices, discussing the applicability of this approach in combination with two photon polymerization (2PP) technique [5], to the direct fabrication, simple handling and seamless integration of micro-structures (Figure 1.b), toward the realization of Micro Electro-Mechanical Systems (MEMS), in the framework of the EU funded project 5D NanoPrinting [6].

References

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Figures

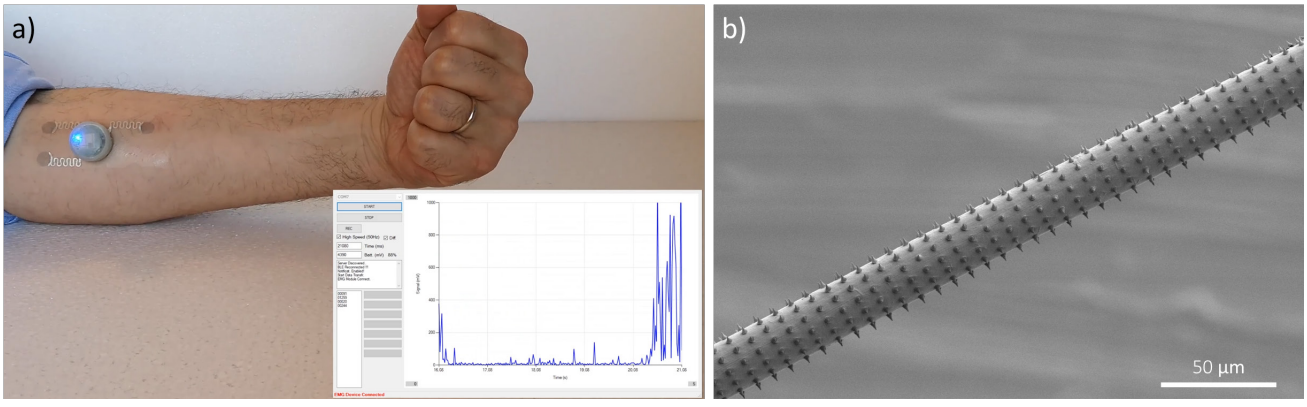

Figure 1: a) Ultrathin conformable tattoo electrodes for detection of electromyographic signals and wireless transmission. b) Example of microstructures integrated on a small diameter wire by nanometric-thin film wrapping.