Toward the design of new organic neural interfaces: the contribution of AFM imaging

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Neural interfaces are gaining interest in a large variety of different fields, likewise neural recording and stimulation (1) and regenerative medicine (2). Their combination with organic conductive polymers, with specific regard for poly (3,4-ethylendioxythiophene) (PEDOT:PSS), enable the design of innovative bio-hybrid interfaces which allow to explore the behavior of neural cell when cultured in presence of electrical stimulation (3). Solution processability of PEDOT:PSS also enables to tailor micro- and nanostructured surfaces, further enhancing the versatility of bio-hybrid organic neural interfaces (4). Here, we evaluated the behavior of neuronal cells cultured on different PEDOT:PSS substrates with the final aim to create an implantable scaffold for spinal cord injury repair. Neuron growth has been investigated with a variety of techniques, including atomic force microscopy (AFM) imaging. AFM studies revealed important morphological details that cannot be appreciated with other imaging techniques, like confocal microscopy and scanning electron microscopy (SEM), demonstrating the high potential of AFM also in the field of regenerative medicine.

References:

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