

## Publication

## Assessment of insulated conductive cantilevers for biology and electrochemistry

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This paper describes the characterization and application of electrically insulated conductive tips mounted on a cantilever for use in an atomic force microscope and operated in liquid. These multifunctional probes were microfabricated and designed for measurements on biological samples in buffer solution, but they can also be employed for electrochemical applications, in particular scanning electrochemical microscopy. The silicon nitride based cantilevers had a spring constant  $\leq 0.1 \text{ N m}^{-1}$  and a conductive tip, which was insulated except at the apex. The conductive core of the tip consisted of a metal, e.g. platinum silicide, and exhibited a typical radius of 15 nm. The mechanical and electrical characterization of the probe is presented and discussed. First measurements on the hexagonally packed intermediate layer of *Deinococcus radiodurans* demonstrated the possibility to adjust the image contrast by applying a voltage between a support and the conductive tip and to measure variations of less than 1 pA in faradaic current with a lateral resolution of 7.8 nm.

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