

Biosensing

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The course introduces to the main concepts of biosensor devices, from the development of a selective platform able to specifically recognize and bind a biomarker to the methods used to detect the recognition events. The first part of the course presents the strategies currently used to anchor a functional sensing molecule to planar surfaces, colloidal systems or micro/nanofluidic structures, comparatively discussing the advantages and disadvantages of the different approaches.

The second part of the course presents the operation principles of different experimental methods that can be exploited to detect the molecular recognition events, from atomic force nanolithography to spectroscopic ellipsometry and surface plasmon resonance, up to quartz crystal microbalance. Moreover, the course explores single-molecule manipulation and detection strategies based on nanofluidic systems.

Applications and examples from current literature will be discussed.