
Job title TFG/TFM: **Optomechanical sensors with mechanochromic response for biosensing**

Job description Final Master Project (TFM)

Description

Microcantilever-based biosensors have emerged as an outstanding tool for label-free detection owing to their high sensitivity and fast response time. Microcantilevers are able to transduce a biomolecular recognition process, occurring on one side, into a few nanometer deflection. However, this requires highly sensitive detection systems, which are expensive, bulky, hard to align with sensors, and that do not scale well with the number of sensors. This limitation reduce the applicability of this technology to the clinic. The aim of this work is the development of a new type of microcantilever-based sensors with colorimetric response to solve these limitations, improving the multisensing capabilities of these sensors and simplifying the detection system. It is a multidisciplinary project that involves different fields such as microfabrication, mechanics, optics, materials, and biochemistry.

Background and Skills

- Background in Physics, Chemistry, Nanotechnology or Biochemistry.
- Simulation skills are very welcomed (COMSOL,..).
- High motivation and capacity to learn.

Tasks

- Design and fabrication of polymeric cantilevers with structural coloration (i.e. nanopatterning of its surface)
- Characterization of its mechanical and optical properties
- Comparative of the experimental results depending on the used polymer properties (Young's modulus)
- Biosensing of a model protein by functionalizing the sensor surface with a specific antibody.

How to apply

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