

Independent Study at Smart Interfaces in Environmental Engineering (SIEN)

Nano- mechanical Characterization Artificial Cell Membranes

At SIEN, we create artificial cell membranes with an aim to mimic one or many functions as of a biological cell. While the interfacial structure and interactions are very important in order to study cytotoxicity and trans-membrane protein functionalities, it is also important to synthesize the cell membrane with similar mechanical properties to that of live cell, to understand the response of cell to external forces/mechanical cues. In order to achieve this we plan to measure the nano-mechanical properties of cells such as mechanical modulus and shear rigidity using atomic force microscopy (AFM). The *specific aim* of the project is to optimize the membrane structure with the help of Quartz Crystal Microbalance (QCM) and later quantitatively estimate the mechanical properties of the synthesized structures using AFM. This project is an excellent opportunity in gaining experience with working in a lab dedicated to surface science and nanotechnology research. A Postdoc will directly supervise the student, although, student's ability to be self-directed and independent is crucial.

The student will be involved in:

- Optimization of the structure of artificial cell membranes using Quartz Crystal Microbalance.
- Handling AFM probes and basic AFM imaging.
- Analysis of experimental data.

Preferred background:

Preferable for students with a past experience in wet-lab chemistry. Experience in scanning force microscope or Quartz Crystal Microbalance will be an added advantage but not necessary. Grades will be taken into account.

Contact Persons:

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