Our research spans a wide range of areas from energy production including hydrogen fuel cells to cell culture studies on modified surfaces. Our research interests include molecular electronics, drug delivery using microfluidic systems and cell biology applications. Some of our current research activities include:

- Synthesis and characterization of highly ordered mesoporous silica (MCM-41) containing Pd-Co or Pd-Ni nano-catalysts.

- Characterization of nano-catalysts for syngas conversion to higher alkanes and steam reforming (H₂ production) of methanol and biofuels.

- Surface Modification by anodic oxidation to yield micro-/nano-porous Si; Ti/TiN sputtered on porous Si; nano-assembly of self-assembled monolayers (SAMs) on Si, ITO, GaAs.

- Impedance characterization of SAM-modified ITO and micro/nano-porous Si.

- Cell culture studies on micro/nano-porous Si, Ti/TiN sputtered on porous-Si and SAM-ITO towards the development of biosensors.

- Hepatocytes on SAM-ITO to develop bioreactors for drug toxicity screening.

- Investigation of biocatalysis and degradation of pollutants using nanoassembly of enzymes immobilized on polyelectrolytes (polymers).

Recent publications...


To know more about our research or if you are interested in joining our group, please contact Dr. Debasish Kuila.