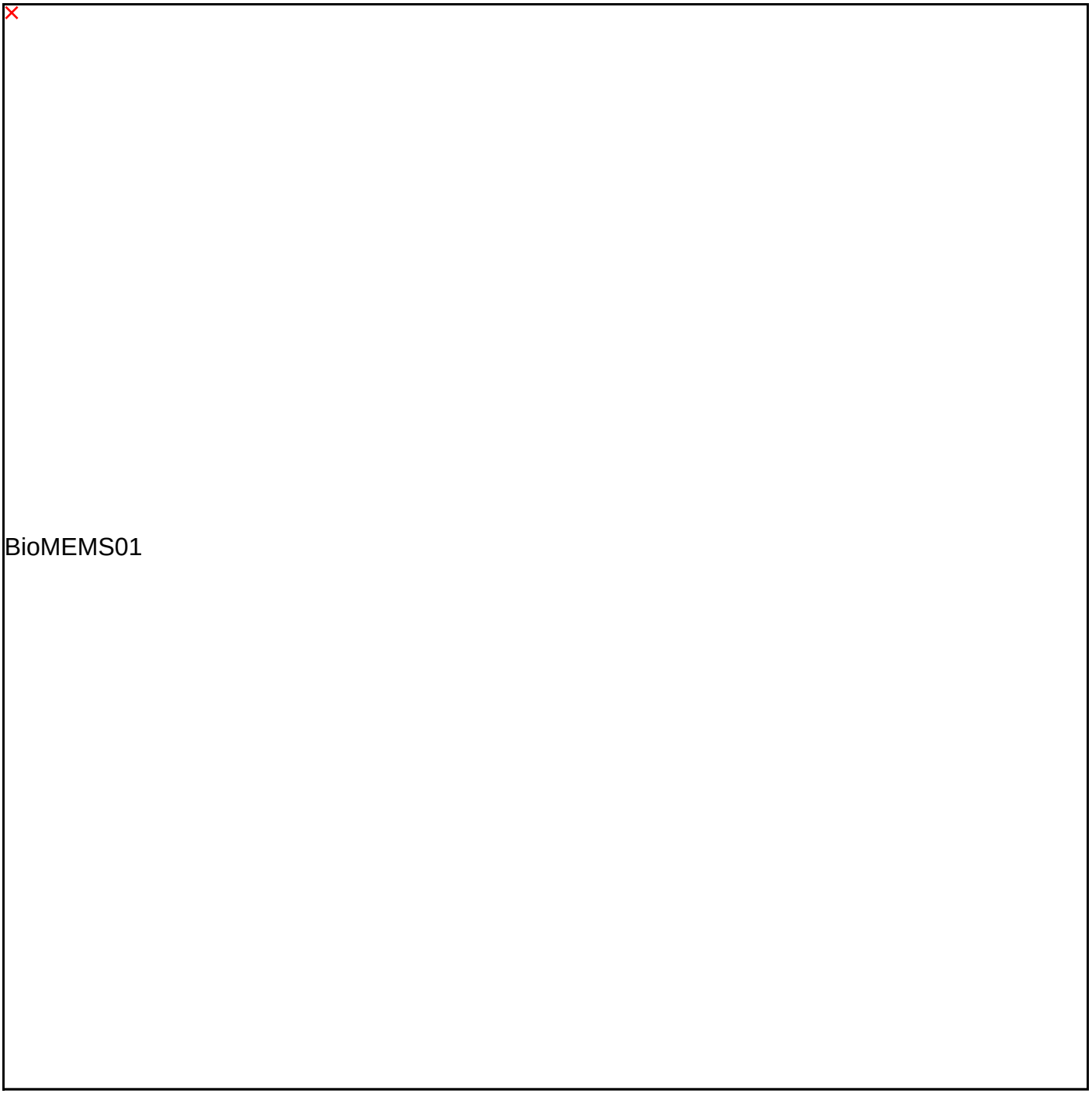
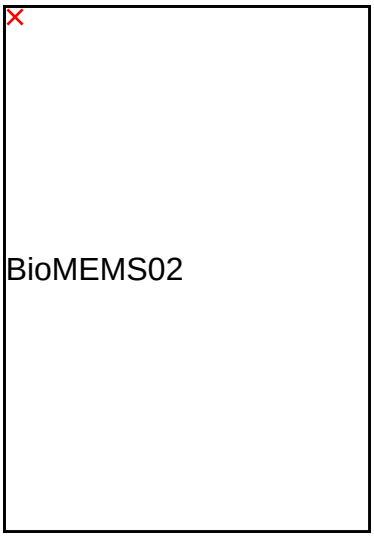
Piezo MEMS/BioMEMS



BioMEMS01

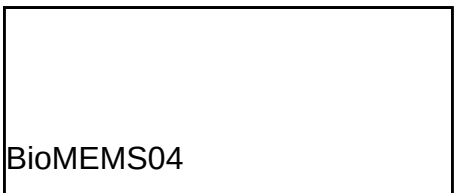
The PiezoMEMS team has a specific interest in BioMEMS applications. Biomedical devices is an area that can benefit from making smart miniature devices such as in BioMEMS applications. These applications can range from wearable devices to implantable devices.

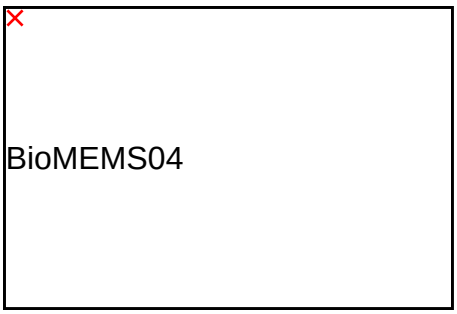
Smart materials can be the active layer for MEMS devices which can be used as a sensor, actuator, transducer, or energy harvester.



One of the key challenges associated with BioMEMS is to ensure that all the materials are biocompatible. Our group has worked closely with medical partners to test the biocompatibility of our materials in specific applications. Creating flexible/stretchable BioMEMS devices is critical for numerous applications. The PiezoMEMS team is currently developing novel methods for creating flexible/stretchable smart materials and devices. This includes developing flexible smart materials as the active layer, as well as development of flexible/stretchable electronics and packaging.

The group has developed methods to create flexible piezoelectric materials that are both MEMS compatible and biocompatible. These materials have been used in energy harvesting devices to power a leadless pacemaker. Another application that the team is currently developing includes resonator based biosensors. These devices consist of a PiezoMEMS resonator, which functions as a sensor when biomarkers are adhered to the surface. The team is also developing highly efficient novel devices to create aerosols which can be used for drug delivery applications. Our technology is also useful for tactile sensing for prosthetics or robotics.





Development of biocompatible flexible thin film piezoelectric materials and other smart materials offer numerous benefits to in the area of BioMEMS, and the team is always interested in developing new technology and materials to enhance device performance in the medical field through monitoring, diagnostics, and therapeutic methods.

Contact

- Nathan Jackson
  MNS (Circuits and Systems) - Hetrogeneous Integration
  +35321 4904120
  nathan.jackson (at) tyndall (dot) ie_unpublished