

Seminar

Date: 27 April 2009 (Monday)
Time: 11:00 am - 12:00 pm
Venue: Y943, The Hong Kong Polytechnic University

Microfabricated Magnetoelastic Biosensors for the Detection of Bacillus Anthracis Spores

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Abstract:

Bio-agents such as Bacillus anthracis or Salmonella typhimurium pose an imminent threat as terrorist agents. As seen from the anthrax terrorist attacks of the U.S. Postal Service in 2001, widespread panic and fear amongst the general public can easily disrupt both commercial and agricultural sectors of the U.S. economy. Magnetoelastic biosensors for the detection of Bacillus anthracis spores have been fabricated and tested in liquid solutions containing known concentrations of spores. The biosensors are comprised of a magnetoelastic resonator and bio-molecular recognition element (phage) that has been engineered to bind the target agent, Bacillus anthracis, multi-valently. The magnetoelastic particles were manufactured using microelectronics fabrication techniques. Phage was engineered at Auburn University and immobilized onto all surfaces of the sensor. Tests were conducted to determine the sensitivity and detection limit of the biosensors by exposing the biosensors to static solutions containing known concentrations of spores. Upon capture of the target agent (Bacillus anthracis spores) by the phage, an increase in the mass of the biosensor occurs. This increase in mass causes a change in the resonance frequency that is proportional to the mass increase. The change in biosensor resonance frequency was measured wirelessly and remotely. Scanning electron microscopy was used to confirm binding of spores to the sensor surface.

Biosketch:

Dr. Chin is now the Director of Auburn University Detection and Food Safety Center, the Elected Chairman of Materials Engineering at Auburn University and Professor of Auburn University. He has been the principal investigator, co-principal investigator, or co-investigator of over 8 million dollars of externally funded projects in the last 5 years. His Areas of technical expertise are: Sensor development, biological sensor materials, adaptive materials, failure analysis, time dependent deformation, mechanical lifetime prediction, welding and joining, and environmental degradation of high temperature materials.

* Refreshment will be served after the seminar.