The Electrical and Computer Engineering Program presents
ECEN Seminar Series

Molecular characterization of tumors and potentially malignant lesions of oral cavity.

Binay Panda
Bio-IT Centre, Institute of Bioinformatics and Applied Biotechnology, Bangalore, INDIA

Wednesday, 23 October 2013, 12 – 1 p.m.
Lecture Hall 238
Light lunch will be served

The development in the field of high-throughput DNA sequencing holds tremendous potential for disease diagnosis, treatment, synthetic biology and agriculture. With the chemistry to generate sequence data using high-throughput assays largely taken care of, the challenge is shifted from 'data generation' phase to 'data management, analysis and interpretation' phase. Managing this data deluge combined with biological interpretation and follow up validation studies remain the talking points in key next-generation sequencing meetings. During the course of the talk, I shall speak about the utility of high-throughput tools like DNA sequencing as useful for diseases like cancer.

Head and neck squamous cell carcinoma is the sixth most common cancer in the world, with a mortality rate of nearly 50%. Oral cancer is the most common subtype of head and neck cancers in human, with a worldwide incidence in greater than 300,000 cases. India has one of the highest incidence and mortality of oral cancers in the world. Oral tongue tumors are especially important to study as the rate of metastasis is higher for tongue sub-site than others in the oral cavity and the rate of incidence for oral tongue cancer is increasing, especially among young age population (<45yrs of age), both in India and in the USA. Smoking and alcohol consumption are two main risk factors for oral cancer. By using new-generation genome sequencing, we have analyzed the coding regions of the genome and transcriptomes of oral tongue tumors and their associated potentially malignant lesions from the same patients. Pipeline tools were optimized to attain significant sensitivity in detecting SNVs, copy number alterations and other structural variations. I plan to discuss about our findings on novel somatic SNVs, indels, structural variations, novel transcripts and epigenetic changes in oral tongue tumor and their potential role in cancer diagnosis, prognosis and choice of therapy application.

Binay Panda received his Ph.D. from University of Oxford, UK and was an American Cancer Society postdoctoral fellow at the Scripps Research Institute, La Jolla, USA. Before returning to India to set up the Bio-IT Centre, he co-founded a molecular diagnostics startup company in the San Francisco bay area with focus on early detection of cancer using genetic markers. Binay also worked as a visiting researcher of genome science at the University of Tokyo, Japan. His current research interest includes cancer genomics, synthetic biology and computational biology. Binay is a visiting professor at the Mazumdar Shaw Cancer Center at the Narayana Hrudayalaya, Bangalore.

FOR MORE INFORMATION:

Noha Ezzat
noha.ezzat@qatar.tamu.edu
+974.4423.0152