

**Title: Developing Personalized Treatment for Children with Brain Tumors:
 From the Bench to the Bedside**

Speaker:

Dr. Ching C. Lau, MD PhD
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Date: Friday, 8 July 2011

Time: 11:00 am – 12:00 noon

Venue: Room 603, Chow Yei Ching Building

Abstract:

Despite advances in multi-modality therapy including surgery, radiation and chemotherapy, the prognosis for children with malignant brain tumors remains poor. Even among the survivors, there are long-term neuro-cognitive sequelae of the disease compounded by the adverse effects of the therapies on the developing brain and other organ systems. Thus there is an urgent need to develop more specific therapies that can optimize survival while minimizing the toxic effects on the normal brain tissue. With the goals of identifying reliable biomarkers that could predict disease progression and response to therapy as well as discovering novel therapeutic targets, we and others have made use of high throughput and comprehensive genomic technologies such as gene copy number and expression profiling coupled with ever improving computational resources and innovative algorithms to probe deeper into the complex process of the pathogenesis of several pediatric brain tumors including medulloblastoma. In the last few years, such genomic studies have provided a much better understanding of the biology of medulloblastoma and helped identify novel therapeutic targets. These include the recognition of at least four subtypes of medulloblastoma two of which are characterized by the involvement of the sonic hedgehog (SHH) or the wingless (WNT) pathways and the association of the over-expression of ERBB2 with poorer prognosis in medulloblastoma. Each genomic subtype of medulloblastoma has its own prognostic implications. Pre-clinical studies using inhibitors of SHH pathway and ERBB2 tyrosine kinase inhibitors have shown promising results. In addition, recent

findings of mutations in genes involved in chromatin remodeling suggest that induced differentiation is also a very attractive therapeutic strategy since normal brain tissue will theoretically be spared the deleterious effects of cytotoxic agents. Finally, novel methods used to exploit these potential targets such as nanotechnology and the development of cancer vaccine based on chimeric T-cell receptors against ERBB2 will also be discussed.

Biography of the speaker:

Ching C. Lau, M.D., Ph.D., is an Associate Professor of Pediatrics, and Co-Leader of the Pediatrics Program of the Dan L. Duncan Cancer Center at Baylor College of Medicine (BCM) in Houston, Texas. He is also an attending physician at the Texas Children's Hospital. His research interests include the molecular biology of pediatric brain and bone tumors and the clinical applications of genomic technologies with the ultimate goal of developing personalized treatment of children with cancer. His laboratory seeks to identify new, reliable prognostic markers and novel therapeutic targets in pediatric brain and bone tumors using advanced genomic and proteomic technologies. Dr. Lau's laboratory is focusing on establishing the molecular classification of three major types of pediatric brain tumors: medulloblastoma, ependymoma, and germ cell tumors, as well as that of the bone tumor osteosarcoma. More recently, he is also using genomic technologies in genetic epidemiology research including genome-wide association and genetic linkage studies of gliomas. He is also using second generation DNA sequencing strategies in genomic profiling of cancers. Dr. Lau is the Director of Research of the Pediatric Neuro-oncology Program and the Director of the Cancer Genomics Program. He is also a member of the Bioinformatics Steering Committee and Biopathology and Translational Research Committee of the Children's Oncology Group. Dr. Lau has published more than 80 research papers and book chapters. He is well funded by both the National Institutes of Health and private foundations and is the Principal Investigator of the NCI Therapeutically Applicable Research to Generate Effective Treatments (TARGET) Project on osteosarcoma. Dr. Lau is committed to training the next generation of scientists in computational biology and bioinformatics. He is currently an Executive Committee member of the Structural and Computational Biology and Molecular Biophysics (SCBMB) at BCM and the Co-Principal Investigator of the Computational Cancer Biomedicine Training Program funded by the Cancer Prevention & Research Institute of Texas (CPRIT).

Organizer: Prof. Y.S. Hung