

## **G-protein coupled receptors in cardiovascular diseases: Building bio-engineering platforms to unravel molecular mechanisms**

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**Belknap Research Building, Room 139 (Auditorium)**

**Video streamed live at [mms://livestream.louisville.edu/remotelive](https://mms://livestream.louisville.edu/remotelive)**

Seven transmembrane G-protein coupled receptors (GPCRs) play a critical role in several biological and pathological processes and have been favorite molecules for drug targeting. Leukotriene B<sub>4</sub> (LTB<sub>4</sub>), a pro-inflammatory lipid molecule, mediates its actions via a high affinity GPCR known as BLT1. The LTB<sub>4</sub>/BLT1 axis was shown to be an important mediator of inflammatory disorders including atherosclerosis, arthritis and asthma. Molecular insights into the structure-function of LTB<sub>4</sub> receptors and LTB<sub>4</sub>-mediated signal transduction pathways will be discussed. Briefly, we have identified the critical amino acid residues involved in the ligand binding, activation mechanism, phosphorylation of the receptors. We have also demonstrated a critical role for BLT1 in the development of atherosclerosis and identified mechanisms involved in the disease progression. Currently, in collaboration with bio-engineering department we are developing new systems for understanding the GPCR functions in cells under stress. Specifically, we are investigating how dynamic shear stress alters growth and expression patterns of BLT1 and other atherogenic genes in human umbilical vascular endothelial cells.

Dr. Jala is an Assistant Professor and Chairman of Curriculum Committee of the Dept of Microbiology and Immunology at the University of Louisville since 2004. He received his Ph.D. in Biochemistry from the Indian Institute of Science, Bangalore, India in 2001. He joined the James Graham Brown Cancer Center, Dept of Microbiology and Immunology at UofL as a Postdoctoral Fellow in 2001 and joined the Faculty in 2004. Dr. Jala's research has been recognized by the “best Poster Award (1<sup>st</sup> prize)” at Research Louisville in 2003 and he received “Prof. A. Krishnamurthy Award” for the best paper published in Indian journals from Society for Biological Chemists in 2004.

Dr. Jala's research focuses on structure-function relationships of G-protein coupled receptors (GPCRs) and their role in the development of inflammatory diseases. His main focus is in investigating the causative effects and mechanisms in the development of inflammatory diseases in mouse models, especially in atherosclerosis, arthritis and colon cancer. GPCRs are the largest known class of molecular targets with proven therapeutic value. GPCRs are instrumental in the transmission of a wide range of chemical messages from the extracellular environment to the interior of the cell. GPCRs have been implicated in a wide range of disorders including allergies, cardiovascular dysfunction, depression, obesity, cancer, pain, arthritis, diabetes, AIDS and various central nervous system disorders.