Speaker Bio

Personal Biography

I have a long-standing interest in cancer biology and its underlying mechanisms, using both murine and cell culture models. The underlying hallmark of cancers is their genomic instability, which is allowed them to adapt and accumulate DNA damage. As a result of loss of function in one or more DNA repair genes, cancer cells can bypass cell cycle checkpoints and accumulate mutations in the genome, leading to genome complexity and affecting the clinical response in cancer patients.

During my Ph.D. in Professor Pei-Jun Lu's lab, I collaborated with colleagues to uncover the roles of proteins, lncRNAs, and miRNAs in tumor progression and metastasis, as well as the potential of miRNAs as diagnostic biomarkers via liquid biopsy.

After completing my Ph.D., I joined Professor Julian Stingele's lab to continue my research in the areas of DNA damage and repair, specifically focusing on DNA-protein crosslinks (DPCs). DPCs are formed by proteins covalently linked to DNA and unpaired DPCs induce replication stress, leading to double-stranded breaks (DSBs), which are extremely toxic to cells. SPRTN is a DPC protease that resolves DPCs and allows for subsequent repair mechanisms. SPRTN is an essential gene and knockout of SPRTN in mice leads to embryonic lethality. Mutations in SPRTN with Ruijs-Aalfs syndrome patients result in C-terminal truncation (SPRTN-ΔC), leading to premature aging and early-onset hepatocarcinoma. This highlights the importance of comprehending the functional regulation of SPRN in DNA damage response and repair in DPCs. Importantly, we developed the Purification of x-linked Proteins (PxP) method, enabling dynamic monitoring of DPC resolution in cells. The PxP assay will be instrumental in uncovering the impact of DPCs on cancer progression.

Chemotherapy-induced DPCs contribute to cancer treatment efficacy; however, resistance often emerges during therapy. The mechanisms enabling cancer cells to tolerate or evade DPC-induced damage remain largely unclear. In my lab, I aim to investigate the role of DPCs in cancer progression and uncover the underlying resistance mechanisms.