Chunxiao Song joins Ludwig Oxford Branch as Assistant Member

June 16, 2016, NEW YORK AND OXFORD — Ludwig Cancer Research welcomes Chunxiao Song as an Assistant Member at its Branch in Oxford. Song comes to the Ludwig Institute for Cancer Research Oxford from Stephen Quake's laboratory at Stanford University, where he was a post-doctoral researcher. An accomplished scientist, Song has over recent years developed highly sensitive technologies to comprehensively probe the chemical—or "epigenetic"—modifications cells make to their DNA and its protein scaffolding to regulate gene expression. Song's expertise complements that of other Ludwig researchers who have become leaders in the rapidly advancing field of epigenomics.

Epigenetics drives such fundamental processes as embryonic development and the specialization of cells, and plays an important role in a number of complex human diseases, most notably cancer. A better understanding of how cancer cells remodel their epigenomes is likely to provide cancer researchers with deeper insight into everything from drug resistance to metastasis, and contribute to the development of novel therapies and diagnostics.

Song applies a mix of chemical biology, biophysics and genomics approaches to analyze the epigenome. As a graduate student at the University of Chicago, he developed a technology that permits profiling of epigenetic modifications on a single molecule of DNA, and a series of chemical labeling techniques to dissect the functional roles of epigenetic marks. The latter have become standard methods in the field. Song himself applied them to profile the distribution of two types of epigenetic marks across the mouse genome. As a post-doctoral researcher, he devised a highly sensitive method to visualize two major types of DNA modification on a single molecule of DNA.

His laboratory at the Ludwig Institute for Cancer Research, Oxford will continue to develop novel tools and technologies to explore the mechanisms, regulation and interplay of epigenetic modifications made to chromatin, DNA and RNA—the transcribed genetic information. Song, further, plans to develop new technologies to analyze the epigenome in individual cells and apply them to study the heterogeneity of cells within tumors. Such studies promise to open a new window into the biology of tumor evolution and could provide valuable clues to cancer prevention.

His laboratory will also conduct applied research, developing new tools to capture molecules of DNA shed by tumor cells into bodily fluids. He hopes to use these tools to develop new epigenetic biomarkers for liquid biopsies. These minimally invasive biopsies have the potential to significantly improve the early detection of cancers, the personalization of cancer therapy and the clinical monitoring of patient prognoses and responses to treatment.