OHSU Center for Spatial Systems Biomedicine

The Center for Spatial Systems Biomedicine welcomes membership applications from faculty who are interested in participating in an integrated program focusing on the genomics of molecular, cellular and tissue structures. It is comprised of faculty with expertise in multiple aspects of spatial systems biology including:

1. **Genome science** to elucidate details of normal and aberrant genome form and function,
2. **Four dimensional measurement technologies** enabling imaging at scales ranging from Angstroms to cm,
3. **Reporter chemistry** and **cell and tissue engineering** to enable visualization and quantitative analysis of specific molecular machines in cells, tissue and living animals,
4. **Multiparameter data management, visualization and modeling,**
5. **Development of laboratory disease models** that capture the complexity and diversity of human disease function in anatomic context.

The OCSSB engages multiple research programs and links clinical and basic science to address the most pressing and important biomedical questions:

Cancer

How can we tailor treatment to individuals? How can we discover robust therapeutic strategies faster and cheaper? How can we detect aggressive tumors earlier when they are more easily treated? Why is metastatic disease so resistant to treatment? How does the microenvironment influence therapeutic response and can we develop microenvironment independent therapeutic approaches?

Neurobiology

What contributes to the structural and functional basis of specific neural circuits involved in normal and maladaptive neurophysiological processes? How can we identify and map neural connections involved in acute and chronic pain, addiction and reward? How can we evaluate the cellular consequences of promising agents of neurorescue, neurorepair, or neuroprotection?

Cardiovascular disease

Why do non-communicable diseases, such as obesity, diabetes and cardiovascular disease, develop in some but not all individuals? Why do some cardiovascular diseases "run in the family?" How can we predict the beneficial as well as adverse effects of new drugs at the gene and metabolite level?

Immunology and Infectious Disease

What are the molecular requirements of virus entry into host cells? How can we tailor new drugs to interfere with the molecular machinery of viral assembly? How can we boost immune strategies that work against intracellular pathogens? How can we detect the molecular basis of autoimmune induced disease?