

# BDR SEMINAR in Kobe

"CDB SEMINAR" and "QBiC SEMINAR" have been renamed "BDR SEMINAR".

## John Isaac Murray

Department of Genetics Perelman,  
School of Medicine, University of Pennsylvania



**Wednesday, January 16, 2019 16:00-17:00**

7F Seminar Room, DB Building A, Kobe

## A comprehensive spatiotemporal map of embryonic gene expression in *C. elegans*

### Summary

A central goal of developmental biology research is to identify how genes control cell fate and execute the complex cellular behaviors needed to generate a multicellular organism. A critical step is to define the expression patterns of all key regulators and their targets. We have used a "whole organism shotgun" approach to measure mRNA levels at single cell resolution genome-wide across the entire embryo. We used the 10x Genomics platform to collect single cell RNA-seq data from over 100,000 single cells from embryos at different developmental stages. The resulting dataset provides genome-wide expression levels over time as all embryonic cell types are specified and differentiate. In parallel, we have used 4D microscopy and automated cell tracking to define the expression of hundreds of genes across *C. elegans* embryogenesis. Combining these data with known markers of terminal cell fates has allowed us to identify the majority of embryonic cells and compare their expression genome-wide. These efforts have identified new candidate regulators of progenitor identity, and fundamental insights about the nature of embryonic gene regulation and developmental robustness.



RIKEN Center for Biosystems Dynamics Research (BDR)

**Host: Shuichi Onami**  
Developmental Dynamics, BDR  
[sonami@riken.jp](mailto:sonami@riken.jp)  
Tel: 95-3440