Stem & PRogenitor Cell INterest Group

Wednesday, January 16, 2019

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"Barcoding of mammalian cells using homing CRISPR"

Rationale:
Occasional presentations by faculty mentors regarding paradigm-shifting discoveries or enabling techniques in areas related to stem and progenitor biology could be useful to the VCSCB community.

Coverage:
Combinatorial barcoding may provide an essential and refined level of understanding of lineage connections in many biological and disease contexts. I aim to guide discussion over Kalhor et al. ([Church Lab] *Science* 2018; doi 10.1126/science.aat9804), which describes homing-guide RNA/CRISPR-based barcode lineage-labeling of millions of cells in mammalian embryos. Kalhor's 60-insert hgRNA transgenic mouse strain may be bred to constitutive, tissue-specific, or inducible iCAS expressers, for flexible tracing approaches with minimal derivation of new strains. I will include a speculative proposal from Gaj and Perez-Pinera (*Genome Biology* 2018; doi 10.1186/s13059-018-1541-y) for using EvolvR (Halperin et al. [Dueber lab] *Nature* 2018; doi 10.1038/s41586-018-0384-8 –– an nCas9 variant fused to error-prone DNA polymerase) to generate greater barcode diversity, potentially from fewer hgRNA insert sites. I hope for active discussion of applications and limitations.

Serendipity: While I selected this paper many months ago for this SPRING presentation, please note that Dr. Reza Kalhor (first author) will visit us as a CDB faculty candidate on Jan 24/25, 2019.

9:00 am – 9455 MRB IV

Bagels provided