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oirm Ontario Institute for Regenerative Medicine

Dr. Jenny Nichols

Cambridge Stem Cell Institute

THURSDAY JANUARY 18, 2018

9:00AM-10:00AM

TITLE: "Pluripotency and Cell Fate Decisions in the Early Mammalian Embryo"

Terrence Donnelly Centre
160 College Street, 2nd Floor. Toronto ON M5S3E1
Red Seminar Room

BIOGRAPHY

We are currently optimising conditions to capture naive pluripotent stem cells from non-rodent mammalian embryos using a modified version of the mouse ES culture regime. How the pluripotent lineage is established during development is also an interesting question, which we address using molecular and genetic approaches incorporating mouse lines with specific and inducible deletions in key pluripotency factors.

We quantify transcripts using single cell technology and proteins by quantitative immunofluorescence. Conditional deletion mutants provide a valuable system with which to explore the temporal requirement for factors of interest during entry and exit from pluripotency and lineage priming. ES cells maintain a molecular profile closely related to the early epiblast from which they originate. They also retain the capacity to integrate into preimplantation embryos. We exploit this phenomenon to challenge the host embryo to react to the influx of epiblast cells and monitor its response in terms of selective elimination or modification of lineage decisions. Microinjection, live imaging and immunohistochemistry comprise the main tools for this project.

In collaboration with Wolf Reik and members of the Wellcome Trust Strategic Award consortium for single cell technology, we are exploring the molecular properties (currently transcriptome and methylome) of single embryo cells during cell lineage decisions, exit from pluripotency and gastrulation. We wish to understand when and how cells commit to specific tissues, identify lineage-specific molecular motifs and investigate the roles of heterogeneity of expression and cell-cell communication.

FOR MORE INFORMATION PLEASE EMAIL DEREK VAN DER KOOY: derek.van.der.kooy@utoronto.ca

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