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Field of Research (2 keywords): Cancer, epigenetics

Department: Medical Biophysics, University of Toronto

School of Graduate Studies Appointment (IMS, LMP, IHPME etc)? Yes/No: Yes

If YES, please name: Faculty of Medicine

Project Title: Chromatin determinants of cancer stem cells

Brief Project Description (<300 words):
Cancer stem cells lie at the apex of tumor hierarchy, thus defining the optimal target for therapeutic intervention in cancer patients. The commitment of stem cells to mature cells is dependent on epigenetic changes that restrict the accessibility of the DNA guiding chromatin compaction. Hence, epigenetic drugs promoting chromatin compaction to limit DNA accessibility are hypothesized to preferentially target cancer stem cells. We propose to address this hypothesis using a collection of 40 epigenetic chemical probes serving as lead compounds available through the Structural Genomics Consortium against populations of breast cancer stem cells (BCSCs). The efficacy of these chemical probes to negate the self-renewal capacity of BSCSs will be assessed through in vitro and in vivo limiting dilution assays. Their mechanisms of action will be confirmed by characterizing their impact on the genome-wide distribution of their target chromatin factor and associated epigenetic modifications. Together, this proposal is geared towards identifying new therapies against BCSCs and provide an opportunity to eradicate this disease.