Daniel A Rappolee, Endocrinol Metab Synd 2014, 3:2
http://dx.doi.org/10.4172/2161-1017.S1.005

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference on
Endocrinology
October 20-22, 2014 DoubleTree by Hilton Hotel Chicago-North Shore, USA

Several reproductive stressors induce stress enzyme-mediated differentiation of placental trophoblast stem cells to produce hormones of early but not later placental lineages

Daniel A Rappolee
Wayne State University School of Medicine, USA

Hyperosmotic stress acting at the cells surface, benzopyrene induced mutagenic stress, and hypoxic stress activate the stress enzymes stress-activated protein kinase/jun kinase (SAPK/JNK) and AMP-activated protein kinase (AMPK) in mouse placental trophoblast stem cells (TSCs) and the blastocysts TSCs were derived from. In TSCs SAPK mediates induction of Hand1 transcription factor (TF) necessary for differentiation to giant cell lineages and necessary for placental lactogen (PL)1 hormone production. SAPK does not mediate the loss of Inhibitor of Differentiation (ID)2 that blocks Hand1, but AMPK does. AMPK also mediate the loss of several other potency TFs besides ID2 in both TSCs, embryonic stem cells (ESCs), and embryos. Together SAPK and AMPK mediate induction of the first lineage and hormones from TSCs, but suppress later placental lineages and hormones. Earliest markers of a stressed pregnancy soon after implantation of the embryo into the uterus, involves relative increases in the first placental lineage and hormones and decreases in later lineages and hormones. Of stressors tested to date, hypoxia is unique in inducing differentiation, but limiting full differentiation of lineages that require higher levels of oxygen to enable development of mitochondrial function.

Biography

Dan A Rappolee completed his PhD in 1989 and did postdoctoral work at UC San Francisco until moving to Northwestern University Medical School in 1992. He has been on faculty at Wayne State University Medical School since 2000. He has been on the editorial boards of Reproduction, Molecular Reproduction and Development, and Fertility and Sterility. He has trained numerous students and post docs and has had several NIH, AHA, and NASA grants. He has >50 peer-reviewed publication and >25 papers and book chapters on the impact of stress and stress enzymes on stems cells and embryos during early mammalian development.

drappole@med.wayne.edu