Xenopus Zygote Arrest 2 (Xzar2) binds to the TCS in the 3’ UTRs of the key cell cycle mRNAs, Mos and Wee1. Dominant inhibitory Xzar2 also attenuates the accumulation of Mos and Wee1 proteins during meiotic maturation of Xenopus oocytes. We propose that one role of the Zar proteins in early development may be to regulate the synthesis of maternal cell cycle proteins in the maturing oocyte in anticipation of their roles in fertilization and embryogenesis.

doi:10.1016/j.ydbio.2011.05.523

Program/Abstract # 559
Asian Sand Dust (ASD)—Particle Matter (PM) effect on overexpression of tissue Transglutaminase2
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During springtime in the East Asia, Asian Sand Dust (ASD)—Particular Matter (ASD-PM) from China and Mongolia desert areas over to East Asia on the westerlies and is generally thought to threaten the East Asian health by provoking respiratory illness like bronchitis and asthma and conjunctivitis. And tissue Transglutaminase (TG) are enzymes that are widely used in biological systems and can contribute to various pathophysiological reactions and affect to blood coagulation, skin barrier formation, inflammatory, autoimmune and tissue repair. In this study, we examined how ASD-PM associates lung fibrosis and hepatocyte. C57BL/6 mice were exposed to saline suspensions of ASD particle 3 times a week for 4 weeks, 8 weeks, and 12 weeks. Following exposure with ASD, the liver was analyzed by immunochemistry using hematoxylin and eosin (H&E) and Masson’s trichrome (MT) staining. We studied Transglutaminase mRNA (Tg mRNA) and TG expression, using Real-Time PCR and Western Blot in mice hepatocyte treated with ASD. Long term exposure to ASD showed significant collagen accumulation in the liver as compared with short term mice. And long term exposed sample also overexpress Tg mRNA and TG in hepatocyte. As a result, ASD-PM accumulates collagen and causes overexpression of Tg mRNA and TG. Our results suggest that if people or animals are exposed to ASD, ASD will damage the lung and liver and result to fibrosis.

doi:10.1016/j.ydbio.2011.05.524

Program/Abstract # 560
The expression of urokinase-type plasminogen activator is induced in cultured mouse blastocyst by the high glucose concentration
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During embryo implantation in mammals, the blastocyst penetrates the uterine wall at different depths by an invasive process, involving proteases that degrade the extracellular matrix (ECM), including matrix metalloproteinase 9 (MMP9) and urokinase-type plasminogen activator (PLA2). Plasminogen is activated to plasmin by PLA2 and plasmin degrades ECM and activates some MMPs, like MMP-9. PLA2 and MMP-9 are expressed in primary trophoblast cells of mouse blastocyst in vivo and in vitro and they are secreted abundantly during embryo implantation. High concentration of glucose affects the synthesis and degradation of the ECM in different cell types, because it induces the formation of reactive oxygen species (ROS) that alter the expression of PLA2 and MMPs. Therefore the effect of glucose on the expression of PLA2 in cultured mouse blastocysts was evaluated. Gestation fourth blastocysts were cultured in HAM-F-10, and high glucose 25 mM, was added in different schedules, glucose 6 mM was used as a control, the expression of PLA2 was evaluated using real time RT-PCR and amidolytic assay. Glucose 25 mM inhibits hatching (−25%) and induces a higher activity of PLA2 in the conditioned medium and enhanced the level of PLA2 mRNA in embryo extracts obtained after four days of culture. Hydrogen peroxide (10 mM) induces similar increase in PLA2 activity in the conditioned medium. High concentrations of glucose promote oxidative stress, due to increased formation of ROS, which probably increased the expression of PLA2 in trophoblast cells of mouse blastocysts. Supported by PAPIT, DGAPA, UNAM, grant IN230611.

doi:10.1016/j.ydbio.2011.05.525

Program/Abstract # 561
Comprehensive survey and perturbation of the transcriptional control of Ptf1a
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Pancreatic transcription factor 1a (Ptf1a) participates in the formation of the ternary complex Ptf1, that has a critical role in pancreas specification and is involved in cell fate choices within the pancreas and additionally in the retina, cerebellum, hindbrain and dorsal spinal cord. The proximal promoter of mouse Ptf1a can partially recapitulate pancreatic expression; in addition, an autoregulatory element positively regulates Ptf1a expression in the pancreas, dorsal spinal cord and hindbrain, while a conserved immediate downstream area has dorsal spinal cord activity. Analysis of a spontaneous deletion of downstream Ptf1a non-coding sequence suggests that necessary regulatory elements for proper cerebellar and pancreatic development remain to be identified. We sought to assess the role of Ptf1a autoregulation in a tractable genetic system. As a first step towards this direction we comprehensively characterized cis-regulatory elements tiling the entire sequence of a BAC that recapitulates endogenous expression in zebrafish. We discovered previously uncharacterized regulatory elements with activity in the hindbrain, retina and spinal cord, and also identified a zebrafish autoregulatory enhancer with comparable activity to the known mouse enhancer. Using the BAC transgene that contains all necessary Ptf1a regulatory sequences, we mutated the Ptf1a binding sites within the autoregulatory enhancer, thus perturbing the autoregulatory loop. We are currently testing the ability of the mutated transgene to rescue the Ptf1a null phenotype, to determine the role of autoregulatory control in the dynamics of allocation between opposing cell fates and the stability of terminal differentiation.

doi:10.1016/j.ydbio.2011.05.526

Program/Abstract # 562
Multiple cis-acting enhancers regulate temporal and spatial expression of the human LHX3 gene in the developing pituitary
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LHX3 is a LIM homeodomain transcription factor necessary for proper development of the pituitary and central nervous system.