35th Stem Cell Club Meeting

(Organised by the Stem Cells Research Singapore Website Committee http://www.stemcell.edu.sg)

Date: May, 26th, 2008 (**Monday**)
Time: 5:30 pm
Venue: Breakthrough, Level 4, Matrix

Host: Gerald Udolph

Time	Title	Speaker
5:30-6:30	**Molecular controls of oocyte to embryo transition in mammals**	***Davor Solter*** *IMB, Singapore*
6:30 -	**Wine and Cheese (at Invitrogen facilities, 4th floor Chromos)**	

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Molecular controls of oocyte to embryo transition in mammals

Davor Solter, IMB

The full-grown mammalian oocyte, arrested in prophase of the first meiotic division, contains all of the molecules that will be utilized to bridge the period of transcriptional silence that begins upon completion of oocyte growth and lasts till the activation of the embryonic genome. Nuclei from differentiated somatic cells can be reprogrammed to totipotency in the oocyte milieu during the oocyte to embryo transition. During this period, approximately two days in the mouse, stores of maternal messages are selectively utilized resulting in the synthesis of known and novel proteins. The Gene Ontology vocabulary was used to annotate the molecular functions of the 2-cell embryo transcriptome and compare it with a composite transcriptome of all other cells and organs in the Mouse Genome Database. The 2-cell embryo is enriched in transcripts encoding translation regulators and RNA binding proteins and is depauperate in those encoding ligands and receptors. Gene expression during the oocyte to embryo transition is controlled by timely translation and homologues of factors described in non-mammalian cells, which bind to specific cis-sequences in the 3'UTR of mRNAs are also found in the mouse oocyte and early embryo. Expression of specific retroviral elements varies in a stage-specific fashion and may change expression of adjacent genes. These mobile elements affect gene evolution and my play a role in epigenetic restructuring of the embryonic genome.