8th SIBBM Seminar

Frontiers in Molecular Biology

Epigenetics in Development and Disease

Programme & Abstracts

Palermo, 24-26 May 2012

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Thursday, 24 May

14:00-14:15 **Welcome Address**
Giovanni Spinelli (Director of STEMBIO, Palermo)
Valerio Orlando (SIBBM President)
Pier Paolo Di Fiore (ABCD President)

Session I » Environment, Stress & Epigenetics – *Chair: Davide Corona (Palermo)*

14:15-14:55 **Keynote Lecture:** *Sergio Pimpinelli* (*Rome*) Environmental stress, transposons and evolution

14:55-15:20 **EMBO YIP Lecture:** *Fabrizio D'Adda di Fagagna* (*Milan*) Molecular mechanisms of cellular senescence

15:20-15:45 *Stefan Schoeftner* (*Rome*) ncRNAs tune the function of mammalian telomeres

15:45-16:00 *Fabio Ciccarone (Rome)* Poly(ADP-ribosyl)ation acts in DNA demethylation of mouse primordial germ cells through DNA-damage independent roles

16:00-16:15 *Angelo Rosa (Trieste)* Structure and dynamics of interphase chromosomes

16:15-17:45 **Coffee break and Poster Session I**

17:45-18:00 *Dupriez Vincent* (*Perkin Elmer*) Homogeneous microplate format assays to monitor histone modifications in biochemical and cell-based assays

18:00-18:15 *(Merck presentation)*

18:15-18:45 **Science & Society Talk:** *Giuseppe Testa (Milan)* Reprogramming genomes and reframing rights

18:45-19:15 **Science & Society Talk:** *Enzo De Simone (Naplese)* How (and why) to expose high school students to the emerging concepts at the frontiers of molecular biology: five years experience with the "Eureka" project

Friday, 25 May

Session II » Chromatin Modifications & ncRNA – *Chair: Marco Bianchi (Milan)*

9:00-9:40 **Keynote Lecture:** *Marco Bianchi (Milan)* HMGB1 and the control of nucleosome number

9:40-10:05 **Armenise-Harvard Talk:** *Tiziana Bonaldi (Milan)* Mass Spectrometry approach dissects the proteomic landscape of chromatin functional domains

10:05-10:20 *Maria Cristina Onorati (Palermo)* An RNA memory mechanism to inherit epigenetic marks

10:20-10:35 *Elena Magnani (Busto Arsizio,VA)* CDH1 epigenetic regulation: a role for UHRF1 modulation via promoter associated non-coding RNAs?

10:35-11:00 Coffee break

11:00-11:25 *Davide Gabellini (Milan)* A long non-coding RNA links copy number variation to a Polycomb/Trithorax epigenetic switch in FSHD muscular dystrophy

11:25-11:40 *Francesca Munari (Göttingen, Germany)* Molecular basis of hHP1β/nucleosome interaction in dependence of histone 3 methylation

11:40-11:55 *Marco Di Stefano (Trieste)* Gene co-regulation and co-localization in human chromosome 19: a knowledge-based computational approach

11:55-12:15 **Progetto Bandiera - Coordinator talk:** *Giuseppe Macino (Rome)* The Italian Epigen Project

12:30-14:00 Lunch break

Session III » Epigenetic Signaling in Development, Differentiation & Reprogramming – *Chair: Giovanni Spinelli (Palermo)*

14:00-14:40 **EMBO ABCD Lecture:** *Maria Pia Cosma (Barcelona, Spain)* Wnt signalling and the reprogramming of cell fate to pluripotency

14:40-15:05 *Michelangelo Cordenonsi (Padua)* The Hippo transducer TAZ confers cancer stem cell traits on breast cancer cells downstream of epithelial-to-mesenchymal transition and the deregulation of the cell polarity determinant Scribble

15:05-15:30 *Valerio Orlando (Rome)* Epigenetic control of Repetitive Elements mobilization contributes to cell differentiation and disease

15:30-15:45 *Cecilia Battistelli (Rome)* MyoD regulates p57kip2 expression by interacting with a distant cis-element and modifying a higher-order chromatin structure

15:45-16:00 *Paola Tognini (Pisa)* Experience-dependent expression of miR132 regulates ocular dominance plasticity

16:00-16:20 **Editor Talk:** *David del Alamo (The EMBO Journal, Heidelberg, Germany)* Behind the scenes of scientific publication

16:20-17:45 Coffee break and Poster Session II

Session IV » Functional Epigenomics – *Chair: Valerio Orlando (Rome)*

17:45-18:25 **EMBO Lecture:** *Amos Tanay (Rehovot, Israel)* Hi-C and the hierarchical domain chromosomal topology

18:25-18:40 *Raffaele Giancarlo (Palermo)* The chromatin organization of an eukaryotic genome: sequence specific + statistical=combinatorial

18:40-20:00 General SIBBM Society & Board Meeting (SIBBM members only)

20:30 Social dinner (tickets available at SIBBM registration desk)

Saturday, 26 May

Session V » Epigenetics, Disease & Regenerative Medicine

Chair: Irene Bozzoni (Rome)

9:00-9:40 **Keynote Lecture:** *Irene Bozzoni (Rome)* The increase in complexity of the RNA landscape: new functions of non coding RNAs

9:40-9:55 *Anna Garbelli (Pavia)* A new paradigm for HIV-1 chemotherapy: targeting the host cell viral cofactor DDX3

9:55-10:10 *Federica Lo Sardo (Rome)* PcG-mediated higher order chromatin structures modulate replication programs at the *Drosophila* BX-C

10:10-10:25 *Anna Comel (Trieste)* Dissecting the tumor suppression activity of the bromodomain containing protein BRD7

10:25-10:40 *Italia Anna Asteriti (Rome)* A high-throughput imaging approach to study Aurora-A inhibition in human cell

10:40-11:00 Coffee break

11:00-11:25 *Gabriella Minchiotti (Naples)* Molecular control of satellite cell lineage progression and muscle regeneration through a novel Cripto -dependent mechanism

11:25-11:50 *Vania Broccoli (Milan)* Reprogramming cellular identity for *in vitro* modeling and replacement therapy of Parkinson's disease

12:00-12:30 Chiara D'Onofrio "Giovani" Award (prize to be awarded to the best Selected Talk) - Final Remarks & Departure

Poster Abstracts

(presenting authors are shown underlined)

P27

The expression of PTHrP isoforms in differentiating human fat-derived mesenchymal stem cells

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Mesenchymal stem cells (MSCs) from fat tissue can differentiate *in vitro* towards osteoblasts and adipocytes [1], and to search for stemness/early differentiation markers, we examined the expression of the splicing isoforms of Parathyroid Hormone-related Peptide (PTHrP), a regulator of proliferation, differentiation and apoptosis. The PTHrP gene, coding for three protein variants of 139, 141 and 173 aa, contains two TATA promoters, P1 and P3, and a GC-rich promoter, P2, and nine exons undergoing to alternative splicing [2]. In MSCs we found four mRNAs encoding for the 139 and 173 aa isoforms, whereas osteo-differentiating cells produced only two mRNAs encoding for the same protein isoforms, and adipo-differentiating cells only one mRNA encoding for the 173 aa isoform. Moreover, P2 was always silenced whereas P3 only in differentiated cells. Our results suggest that during differentiation, the expression of PTHrP isoforms becomes increasingly selective. We also examined the methylation state of P2 and P3 in undifferentiated and osteo-differentiating MSCs, to check the possible correlation between methylation and promoter silencing. In agreement with gene expression data, three CpG island internal sites of P2 were hyper- and partially-methylated in most DNA preparations, and CpG sites of P3 were methylated in differentiated cells. We conclude that PTHrP plays a role in the differentiation of MSCs through the selective regulation of isoforms *via* promoter methylation and that PTHrP isoform expression could be considered a putative marker of MSC differentiation.

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[1] Bunnell B. A. et al., Adipose-derived stem cells: Isolation, expansion and differentiation. Methods, 45 (2008) 115-120.
[2] Southby J. et al., Alternative promoter usage and mRNA splicing pathways for parathyroid hormone-related protein in normal tissues and tumours. British Journal of Cancer 72 (1995) 702-707.

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