

SIROCCO

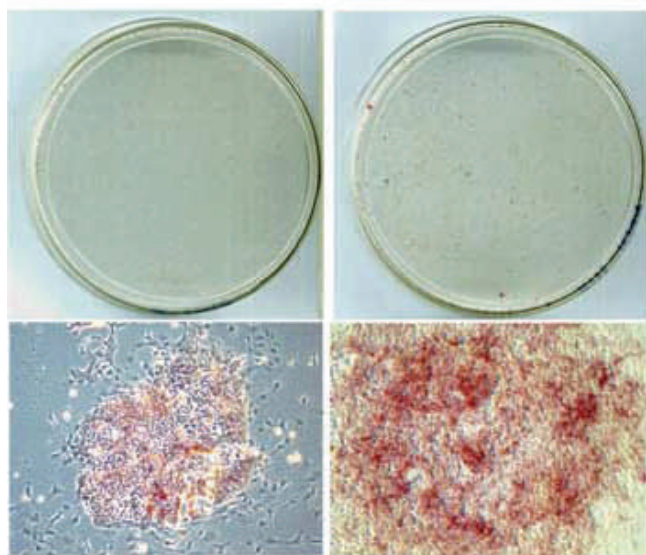
Silencing RNAs: organizers and coordinators of complexity in eukaryotic organisms

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miRNAs modulate differentiation in embryonic stem cells

SIROCCO Partner Tommaso Russo his colleagues from CEINGE have demonstrated in a recent paper that miRNAs play an important role in proper function and differentiation of mouse embryonic stem cells (ESCs). A systematic comparison of miRNA expression in undifferentiated vs. differentiating ESCs showed that 138 miRNAs are increased on the induction of differentiation. Among the candidate targets emerging from this analysis were three genes, Smarca5, Jarid1b, and Sirt1, previously demonstrated to be involved in sustaining the undifferentiated phenotype in ESCs. Smarca5 was demonstrated to be a direct target of miR-100, Jarid1b of miR-137, and Sirt1 was confirmed to be a direct target of miR-34a as previously described. The suppression of these three miRNAs by anti-miRs caused a block of ESC differentiation. These results demonstrate that miR-34a, miR-100, and miR-137 are required for proper differentiation of mouse ESCs, and that they function in part by targeting Sirt1, Smarca5, and Jarid1b mRNAs.



Control

anti-miR mixture

Figure shows the expression of stemness marker alkaline phosphatase. Cells transfected with the three anti-miRs (miR34a, 100 and 137) formed a significantly higher number of AP-positive colonies than controls. Suppression of single miRNAs had no effect on the expression of stemness markers, but suppression of miR-34a, miR-100, and miR-137 clearly hampered ESC differentiation.

[miRNA 34a, 100, and 137 modulate differentiation of mouse embryonic stem cells.](#) Tarantino C, Paoletta G, Cozzuto L, Minopoli G, Pastore L, Parisi S, Russo T. FASEB J. 2010 May 3. [Epub ahead of print]

Detlef Weigel elected as Fellow of the Royal Society



Congratulations to Detlef Weigel who was newly elected as a Foreign Member of the Royal Society for his contributions to the field of Arabidopsis molecular genetics. His work has defined new mechanisms in developmental timing and patterning, and he was the first to link a miRNA to plant development.

The Royal Society is the national academy of science of the UK. It was founded in 1660 and past fellows have included Isaac Newton and Charles Darwin. The continuing commitment of the Society is to expand knowledge and further the role of science and engineering.

<http://royalsociety.org/>



RESEARCH SPOTLIGHT



[miRNA 34a, 100, and 137 modulate differentiation of mouse embryonic stem cells.](#)

Tarantino C, Paoletta G, Cozzuto L, Minopoli G, Pastore L, Parisi S, Russo T.
FASEB J. 2010 May 3. [Epub ahead of print]

[Argonaute quenching and global changes in Dicer homeostasis caused by a pathogen-encoded GW repeat protein.](#)

Azevedo J, Garcia D, Pontier D, Ohnesorge S, Yu A, Garcia S, Braun L, Bergdoll M, Hakimi MA, Lagrange T, Voinnet O.
Genes Dev. 2010 May;24(9):904-15.

[The Conserved miR-51 microRNA Family is Redundantly Required for Embryonic Development and Pharynx Attachment in *Caenorhabditis elegans*.](#)

Shaw WR, Armisen J, Lehrbach NJ, Miska EA.
Genetics. 2010 Apr 26. [Epub ahead of print]

[JM14, a MjC domain protein, is required for RNA silencing and cell-to-cell movement of an RNA silencing signal in *Arabidopsis*.](#)

Searle IR, Pontes O, Melnyk CW, Smith LM, Baulcombe DC.
Genes Dev. 2010 May 15;24(10):986-91.

[Characterizing light-regulated retinal microRNAs reveals rapid turnover as a common property of neuronal microRNAs.](#)

Krol J, Busskamp V, Markiewicz I, Stadler MB, Ribi S, Richter J, Duebel J, Bicker S, Fehling HJ, Schübeler D, Oertner TG, Schratt G, Bibel M, Roska B, Filipowicz W.
Cell. 2010 May 14;141(4):618-31.

[The role of small non-coding RNAs in genome stability and chromatin organization.](#)

van Wolfswinkel JC, Ketting RF.
J Cell Sci. 2010 Jun 1;123(Pt 11):1825-39.

[Argonaute quenching and global changes in Dicer homeostasis caused by a pathogen-encoded GW repeat protein.](#)

Azevedo J, Garcia D, Pontier D, Ohnesorge S, Yu A, Garcia S, Braun L, Bergdoll M, Hakimi MA, Lagrange T, Voinnet O.
Genes Dev. 2010 May;24(9):904-15.

[An endogenous, systemic RNAi pathway in plants.](#)

Dunoyer P, Brosnan CA, Schott G, Wang Y, Jay F, Alioua A, Himber C, Voinnet O.
EMBO J. 2010 May 19;29(10):1699-712. Epub 2010 Apr 22.

SIROCCO2010

The SIROCCO Annual Meeting will be held 11-12 October at the EMBL Advanced Training Center in Heidelberg. Start time is scheduled for 13.00 on Monday 11 October - meeting ends 12.00 Wednesday 13 October 2010.

Accommodation has been booked at the following hotels:

Hotel ISG http://www.isg-hotel.de/index_en.html

Hotel Central <http://www.hotel-central-heidelberg.de/>

Hotel Ibis <http://www.ibishotel.com/gb/hotel-1447-ibis-heidelberg/index.shtml>

Please register for the SIROCCO meeting by email: fah37@cam.ac.uk by **18th July**

The EMBO|EMBL Symposium on the Non-Coding Genome follows the SIROCCO meeting at the same venue.

The EMBO|EMBL Symposium starts with a welcome session at 16.45 Wednesday 13 October 2010.

Travel information: http://www.embo-embl-symposia.org/info_participants/index.html

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