

SIROCCO

Silencing RNAs: organizers and coordinators of complexity in eukaryotic organisms

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Regulation of the miR-212/132 cluster

SIROCCO Partners Simon Arthur and Gyorgy Hutvagner and their colleagues have published a paper describing the regulation of the mouse mir-212/132 cluster by brain derived neurotrophic factor. Synopsis: Neurotrophins are growth factors that are important in neuronal development and survival as well as synapse formation and plasticity. Many of the effects of neurotrophins are mediated by changes in protein expression as a result of altered transcription or translation. To determine if neurotrophins regulate the production of microRNAs, small RNA species that modulate protein translation or mRNA stability, we used deep sequencing to identify brain derived neurotrophic factor (BDNF) induced microRNAs in cultured primary cortical mouse neurons. This revealed that the miR-212/132 cluster contained the microRNAs most responsive to BDNF treatment. This cluster was found to produce four microRNAs; miR-132, miR-132*, miR-212, miR-212*. Using specific inhibitors, mouse models and promoter analysis we have shown that the regulation of the transcription of the miR-212/132 microRNA cluster and the microRNAs derived from it are regulated by the ERK1/2 pathway, via both MSK dependent and independent mechanisms.

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miR-132  5' -uaacagucuacagccaugggucg-3'
          ||| ||| ||| ||| ||| |||
miR-212  5' -uaacagucuccagucacggcca-3'
          ||| ||| ||| ||| ||| |||
miR-132* 5' -AACCGUGGCUUUCGAUUGUUA-3'
          ||| ||| ||| ||| ||| |||
miR-212* 5' - ACCUGGCUCUAGACUGCUUACUG-3'
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Alignment of miR-132 and miR-212 The mature and star sequences for murine miR-212 and miR-132 were aligned. Seed regions are highlighted.

[Regulation of the miR-212/132 locus by MSK and CREB in response to neurotrophins.](#)

Remenyi J, Hunter CJ, Cole C, Ando H, Impey S, Monk CE, Martin KJ, Barton GJ, Hutvagner G, Arthur JS. *Biochem J.* 2010 Mar 23. [Epub ahead of print]

SIROCCO at the 4th ESF Conference on Functional Genomics and Disease



SIROCCO Partners Gunter Meister, Thomas Meyer, Jørgen Kjems and Eric Miska presented a dynamic SIROCCO session at the 4th ESF Conference on Functional Genomics and Disease 14-17 April in Dresden, Germany. The conference was organized by the European Science Foundation in collaboration with the European Commission Directorate of Health.

The European Science Foundation is an association of 79 member organisations devoted to scientific research in 30 European countries. Its core purpose is to promote high quality science at a European level. The ESF facilitates co-operation and collaboration in European science on behalf of its principal stakeholders (Member Organisations and Europe's scientific community).

The journey home for some visitors to Dresden was made more of a challenge due to the eruption of the Eyjafjallajökull volcano in Iceland but the German train service lived up to its reputation for efficiency and coped with the extra travellers.



Conference centre on the banks of the Elbe River



RESEARCH SPOTLIGHT



MicroRNA-directed siRNA biogenesis in *Caenorhabditis elegans*.

Corrêa RL, Steiner FA, Berezikov E, Ketting RF.
PLoS Genet. 2010 Apr 8;6(4):e1000903.

Tracing the evolution of tissue identity with microRNAs.

De Mulder K, Berezikov E.
Genome Biol. 2010 Mar 30;11(3):111. [Epub ahead of print]

HSP90 Protein Stabilizes Unloaded Argonaute Complexes and Microscopic P-bodies in Human Cells.

Johnston M, Geoffroy MC, Sobala A, Hay R, Hutvagner G. Mol Biol Cell. 2010 Mar 17. [Epub ahead of print]

Integration of microRNA changes in vivo identifies novel molecular features of muscle insulin resistance in type 2 diabetes. Gallagher IJ, Scheele C, Keller P, Nielsen AR, Remenyi J, Fischer CP, Roder K, Babraj J, Wahlestedt C, Hutvagner G, Pedersen BK, Timmons JA. Genome Med. 2010 Feb 1;2(2):9.

Management News

PERIOD 3 REPORT:

Comments on the Period 3 (2009) financial report have been received from the European Commission and corrections are underway. Evaluation of the scientific report is pending.

Upcoming Events

SIROCCO Partner Exiqon in cooperation with Tecan is presenting a practical course on high-throughput microRNA profiling in Grödig, Austria 1-2 June 2010
For more information visit <http://www.tecan.com/microrna/>

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SIROCCO2010:

The SIROCCO Annual Meeting will be held
11-12 October 2010 at EMBL in Heidelberg.

See you there!



Heidelberg

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