

SIROCCO

Silencing RNAs: organizers and coordinators of complexity in eukaryotic organisms

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miRNA variants in Huntington's disease

SIROCCO Partner Xavier Estivill and his colleagues have revealed the degree of miRNA variability in the brain tissue of Huntington's disease patients.

Abstract: Huntington disease (HD) is a neurodegenerative disorder that predominantly affects neurons of the forebrain. We have applied the Illumina massively parallel sequencing to deeply analyze the small RNA populations of two different forebrain areas, the frontal cortex (FC) and the striatum (ST) of healthy individuals and individuals with HD. More than 80% of the small-RNAs were annotated as microRNAs (miRNAs) in all samples. Deep sequencing revealed length and sequence heterogeneity (IsomiRs) for the vast majority of miRNAs. Around 80-90% of the miRNAs presented modifications in the 3'-terminus mainly in the form of trimming and/or as nucleotide addition variants, while the 5'-terminus of the miRNAs was specially protected from changes. Expression profiling showed strong miRNA and isomiR expression deregulation in HD, most being common to both FC and ST. The analysis of the upstream regulatory regions in co-regulated miRNAs suggests a role for RE1-Silencing Transcription Factor (REST) and P53 in miRNAs downregulation in HD. The putative targets of deregulated miRNAs and seed-region IsomiRs strongly suggest that their altered expression contributes to the aberrant gene expression in HD. Our results show that miRNA variability is a ubiquitous phenomenon in the adult human brain, which may influence gene expression in physiological and pathological conditions.

[A myriad of miRNA variants in control and Huntington's disease brain regions detected by massively parallel sequencing.](#) Martí E, Pantano L, Bañez-Coronel M, Llorens F, Miñones-Moyano E, Porta S, Sumoy L, Ferrer I, Estivill X. *Nucleic Acids Res.* 2010 Jun 30. [Epub ahead of print]

miRNA length distribution

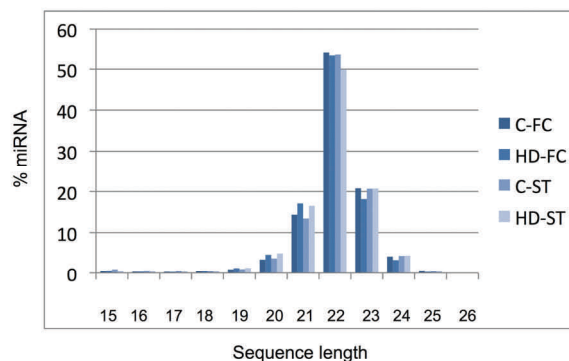


Table legend: Sequences deriving from 372-392 distinct miRNA genes were identified in the different libraries, showing a sequence length distribution with a sharp peak in the 22 nt length. Frontal cortex (FC) and the striatum (ST) are the two brain areas affected in HD. *control FC (C-FC)*, *HD-FC (HD-FC)*, *control ST (C-ST)* and *HD ST (HD-ST)*

Europe's largest investment in research

The European Commission has announced a €6.4 billion investment in scientific research and innovation next year - a 12% increase on this year's allocation. The programme is aimed at creating more than 165,000 jobs and developing "a more competitive and greener Europe", the Commission says. The focus is on tackling climate change, energy projects, food security, health and Europe's ageing population. Funds will be awarded to about 16,000 research bodies and businesses.

"Research and innovation are the only smart and lasting route out of crisis and towards sustainable and socially equitable growth," said the EU Commissioner for Research and Innovation, Maire Geoghegan-Quinn.

"There is no other way of creating good and well-paid jobs that will withstand the pressures of globalisation."

EU-funded research currently accounts for about 5% of the total public funding for research in the EU, she said.

The investment includes more than €600 million for health research, about €206 million of which will go into clinical trials for new drugs.

[http://ec.europa.eu/research/index.cfm?](http://ec.europa.eu/research/index.cfm?pg=newsalert&lg=en&year=2010&na=na-190710)

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RESEARCH SPOTLIGHT



[Viral Protein Inhibits RISC Activity by Argonaute Binding through Conserved WG/GW Motifs.](#)

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SIROCCO2010

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For **SIROCCO** information please contact Aileen Hogan
fah37@cam.ac.uk +44(0)1223 748975