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Regulation and function of non-coding RNAs in epigenetic processes: the paradigm of X-chromosome inactivation

Fact Sheet

Project Information

NCRNAX

Grant agreement ID: 206875

Project closed

Start date
1 April 2009

End date
31 March 2014

Funded under
Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Total cost
€ 1 220 000,00

EU contribution
€ 1 220 000,00

Coordinated by
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS
France

Objective

Some 150 years after the emergence of genetics, epigenetic mechanisms are increasingly understood to be fundamental players in phenotype transmission and development. In addition, epigenetic alterations are now linked to several human diseases including cancers. A common feature of many epigenetic phenomena, for which X-chromosome inactivation (XCI) is the paradigm, is the implication of non-coding RNAs (ncRNAs). Regulatory ncRNAs belong to 2 major classes: (i) long ncRNAs, which can be transcribed from a single strand as well as in the opposite orientation when they may overlap with either protein-coding or non-coding genes. Both sense (Xist) and antisense (Tsix) ncRNAs control the initiation of XCI; and (ii) short ncRNAs, such as si- or miRNAs, which interfere, through different pathways, with gene function. The aim of this project is to gain insights into the regulation and function of ncRNAs in the control of gene expression program, using XCI as a model system. We propose to combine molecular genetics, embryology and cell biology to (1) decipher the transcriptional control of Xist and the coordinate regulation of the Xist/Tsix sense/antisense tandem in relation to developmental programs; (2) functionally characterise a novel ncRNA on the X chromosome which nests several miRNAs and for which preliminary data suggest a role in XCI and (3) develop a system to extend our knowledge of the regulatory stages of XCI in human through the use of human embryonic stem cells. Our comprehensive analysis of the function and regulation of ncRNAs in XCI has important implications for our understanding of the numerous diseases associated with abnormal patterns of inactivation and is a critical prerequisite to any subsequent therapeutic approaches. This project is in absolute adequacy with the future “Epigenetic and Cell Fate “ host centre co-headed by Prs. Lalande and Viegas-Pequignot, a large-scale initiative expected to strengthen French and European research in Epigenetics.

Fields of science (EuroSciVoc)

natural sciences > biological sciences > molecular biology > **molecular genetics**

medical and health sciences > medical biotechnology > cells technologies > **stem cells**

medical and health sciences > clinical medicine > **oncology**

natural sciences > biological sciences > genetics > **RNA**

medical and health sciences > clinical medicine > **embryology**

Keywords

Chromatin modifications

Non-coding RNAs

X-chromosome inactivation

X-chromosome inactivation Chromatin modifications Non-coding RNAs

Programme(s)

FP7-IDEAS-ERC - Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

ERC-SG-LS2 - ERC Starting Grant - Genetics,Genomics,Bioinformatics and Systems Biology

Call for proposal

ERC-2007-StG
See other projects for this call

Funding Scheme

ERC-SG - ERC Starting Grant

Host institution

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS

EU contribution

€ 1 220 000,00

Total cost

No data

Address

RUE MICHEL ANGE 3
75794 Paris
France

Region

Ile-de-France > Ile-de-France > Hauts-de-Seine

Activity type

Research Organisations

Links

Contact the organisation   Website
Participation in EU R&I programmes
HORIZON collaboration network

Beneficiaries (1)

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS

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