A Chemical Genetics Approach towards Cancer Therapy Targeting Histone Demethylases

Fact Sheet

Project Information

Histone Demethylases

Grant agreement ID: 298603

Project closed

Start date
1 March 2012

End date
28 February 2014

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

Total cost
€ 200 371,80

EU contribution
€ 200 371,80

Coordinated by
THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD
United Kingdom

Objective

Cancer is one of the most common causes of death in the EU. The disease is characterized by aberrant gene activity in certain cells. Even today, cancer therapy is

little focused, which is reflected by severe side effects. Consequently, there is a need for novel and better tolerated therapies.
In this proposal an approach to validate a new class of enzymes as targets for cancer therapy is presented. In the cell nucleus, DNA is bound to special proteins, called histones, which play key roles in gene regulation. Histones can be dynamically modified with special marker groups, which allows the control of gene expression without alteration of the DNA itself. Specifically, it is intended to inhibit histone demethylases, specialized enzymes which remove certain marker groups (methyl groups) from histones, which results in gene silencing or activation. Histone demethylases are known to be upregulated in certain cancers and are therefore promising candidates for pharmacological cancer therapy. Ideally, small molecule inhibitors will inhibit cancer growth and might even be able to restore the normal genetic program of a cell.
During the study specific small molecule-enzyme pairs will be created, which allows the study of a single enzyme among very similar ones. This chemical genetics approach encompasses the mutation of the enzyme and the synthesis of specifically tailored small molecules. The properties of the enzyme-inhibitor pairs will be evaluated by in vitro assays and crystallization. Afterwards the compounds will be used to decipher the role of the histone demethylase in cell culture models by microarray methods and RNA sequencing.
The study will be very interdisciplinary and encompass chemical synthesis, biochemistry, cell biology and structural biology.

Fields of science (EuroSciVoc)

natural sciences > biological sciences > genetics > **DNA**

natural sciences > biological sciences > **cell biology**

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

natural sciences > biological sciences > biochemistry > biomolecules > proteins > **enzymes**

natural sciences > biological sciences > molecular biology > **structural biology**

Programme(s)

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

Topic(s)

FP7-PEOPLE-2011-IEF - Marie-Curie Action: "Intra-European fellowships for career development"

Call for proposal

FP7-PEOPLE-2011-IEF
See other projects for this call

Funding Scheme

MC-IEF - Intra-European Fellowships (IEF)

Coordinator

THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD

EU contribution

€ 200 371,80

Total cost

No data

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Region

South East (England) > Berkshire, Buckinghamshire and Oxfordshire > Oxfordshire

Activity type

Higher or Secondary Education Establishments

Links

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

Last update: 2 August 2019

Permalink: https://cordis.europa.eu/project/id/298603