UNIVERSITÉ DE GENÈVE

PRESS RELEASE

Geneva | 16 October 2013

Embargoed until October 17th, 2pm US Eastern time

What is the actual role of epigenetics on the function of the human genome?

UNIL | Université de Lausanne

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

The sequencing of the first human genome in 2001 generated many new questions that remain unanswered. For instance, why do identical twins have subtle differences in physical appearance? Or why are they not equally susceptible to diseases? This is where epigenetics comes into play. It has been postulated that factors such as the environment and our personal histories might chemically influence how our genes are turned on or off without changing the DNA sequence itself. Although epigenetics has received a lot of attention lately, its exact role and impact remains unclear. Scientists at the University of Geneva (UNIGE), University of Lausanne (UNIL), and the École Polytechnique Fédérale de Lausanne (EPFL) have now examined the relationship and interactions between a person's genome and its epigenome. This provides clues to the role of epigenetics in human characteristics and disease risk. The study will be published in the online portal of the journal *Science*.

A group of scientists led by Louis-Jeantet Prof. Emmanouil Dermitzakis at UNIGE, Profs. Alexandre Reymond and Nouria Hernandez at UNIL, and Prof. Bart Deplancke at EPFL, analyzed and compared sequenced genomes and epigenomes of parents and their children. «We were surprised to observe so much epigenetic variability among people», Prof. Deplancke explains. They found that a large portion of epigenome differences among people is actually determined by DNA sequence differences. The epigenome has been previously implicated as a significant contributor to differences among people and its importance has been compared to that of the genome sequence. The scientists found that many epigenetic modifications had only a relatively minor role in switching genes on or off, contrary to previous views. «Our study shows that epigenetic modifications are more likely to reflect molecular interactions on the DNA rather than determine them», says Prof Dermitzakis.

The study has substantial implications for the medical relevance of epigenetic modifications. While the epigenome may be an important biomarker for disease risk and progression, it may be a less relevant target for direct therapeutic interventions.

UNIVERSITÉ DE GENÈVE
Service de communication
24 rue du Général-Dufour
CH-1211 Genève 4

Tél. 022 379 77 17

media@unige.ch
www.unige.ch

contact

UNIGE - Emmanouil Dermitzakis
emmanouil.dermitzakis@unige.ch, +41 78 882 79 22

UNIL - Alexandre Reymond
alexandre.reymond@unil.ch

EPFL - Bart Deplancke
bart.deplancke@eplf.ch, +41 21 693 18 21