International Headache Society

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BIOMIGRAINE: A multidisciplinary approach to the identification of BIOmarkers of MIGRAINE: a proof of concept study based on the stratification of responders to CGRP monoclonal antibodies

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This is an international research project that focuses on the identification of peripheral biomarkers associated to the response to a new class of specific preventive drugs for migraine, the monoclonal antibodies targeting CGRP.

The IHS funds will cover the description of an Epigenetic profiling of subjects suffering from CM enrolled in three European sites.

The project has three different stages:

a.   Exploratory analysis: DNA methylation

We will perform an exploratory DNA methylation profiling study in a Spanish cohort of CM sufferers stratified according to their excellent or poor response to erenumab. Hence, we will develop a computational algorithm to predict, a priori, the clinical response to erenumab therapy in migraine patients based on their epigenetic signature.

b.   Selection of methylated regions

We will replicate the findings obtained in stage a) in a bigger and heterogeneous cohort of CM subjects from Germany and Italy to finally identify the 10 most significant CpG regions and compute their genomic annotation and functional profiling with the current version of the human reference sequence assembly (GRCh38/hg38).

c.   Methylated regions validation as potential migraine biomarkers

We will explore whether a methylation pattern in peripheral leukocytes seen in the previous analysis is associated with the response to erenumab in CM using quantitative methylation approach.

The foreground of the project will represent an important step towards the identification of specific predictors of response to a new class of migraine preventive drugs. The project has also an important educational impact, as we will delegate the conduction of the study to young researchers who will develop research skills and start a young European research network on migraine.