NEURINOX gathers top researchers, patients and industry in an international symposium on innovative concepts for treating neurodegenerative diseases

Press release.

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Neurodegeneration leads to chronic debilitating diseases, including age-related syndromes like Alzheimer's and Parkinson's diseases and disorders affecting younger people such as epilepsy and multiple sclerosis. A common disease mechanism in neurodegeneration is inflammation of the brain, also referred to as neuroinflammation.

Neurinox, a 5-year international biomedical research project running until the end of 2016, was funded with 12M EUR by the European Commission (FP7). The project studies a specific aspect of neuroinflammation, namely the generation of oxygen radicals. Neurinox is led by the University of Geneva and involves 8 academic and clinical groups and 4 small-medium enterprises, from Switzerland, France, Sweden, Greece, Italy and Australia. Neurinox scientists discovered that oxygen radicals have a dual role in neurodegeneration: when they are too few, diseases like multiple sclerosis are more frequent, but when they are too many, other types of neurodegeneration, such as amyotrophic lateral sclerosis (Lou-Gehrig's disease) are accelerated.

Neurinox scientists have investigated how novel treatments can be created on the basis of these observations. They developed the first generation of molecules with drug-like characteristics acting at the source of oxygen radicals – enzymes called NADPH oxidases (NOX). These pharmacological tools are now available for preclinical tests and will give rise to future therapeutics. Furthermore, a number of prospective clinical studies involving multiple sclerosis (MS) and amyotrophic lateral sclerosis (ALS) patients led to discovery of new biomarkers. Neurinox researchers found that oxidation status in cerebrospinal fluid and the activity of NOX in the blood strongly correlate with disease severity of MS and ALS respectively. These findings are encouraging, and their relevance to other neurodegenerative diseases, such as Alzheimer’s, Parkinson’s, chronic inflammatory peripheral neurites, and Huntington’s disease should be tested in the future.

The latest findings of the consortium and its efforts to develop new drugs and personalized medicine approaches for epilepsy, ALS and MS were presented at the Neurinox International Symposium on "Innovative concepts for treating neurodegenerative diseases" which took place in Turin on 23-24 September 2015. The symposium integrated the consortium results into a larger context: patient representatives and opinion leaders from the pharmaceutical industry were providing their views, while high school and university students were invited to offer a fresh vision. The speakers participated in lively discussions involving the public with unexpected and

thoughtprovoking juxtapositions of opinions from patients, students, and researchers. Patient representatives gave personal and deeply impressive testimonials, which were particularly appreciated by all participants. Louise Hoffsten, Swedish musician who suffers from multiple sclerosis shared her expectations: “Lots of medicines were made since I got diagnosed; from the beginning there was nothing. Now there are a lot but it is never enough. I hope I can live to a day when I can experience a cure”. Karl-Heinz Krause, Neurinox director, said regarding the novel treatments for neurodegenerative diseases: “There is a realistic chance that Neurinox can contribute to new and efficient therapies: NOX targeting might be a part of the solution.”

The participation of about 50 high school and university students from 4 different European countries was a highlight of the meeting. Using innovative educational methods, students collected information on specific challenges within the Neurinox consortium. They interviewed patients, pharma representatives, medical doctors and basic researchers and produced short movies that raised enthusiasm among all participants. These videos can be viewed on the Neurinox website (http://www.neurinox.eu/page/neurinox-symposium-on-22-23-september-2015.php), which also provides comprehensive descriptions of neurodegenerative diseases and useful information on NADPH oxidases in health and disease.

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