Preclinical proof of concept of AF243 potency to prevent and/or treat sensorineural hearing loss

From 2012-09-01 to 2016-05-31, closed project | AFHELO Website

Objective

Approximately 10% of the global population (40% of people over 65), suffers hearing difficulties. The socio-economic impact is deep, since in children, early hearing impairment (HI) affects language learning, and in adults, acquired HI impairs social integration. The sense of hearing depends upon the integrity of the sensory epithelia in the inner ear. HI occurs when this tissue is disrupted, that is when the sensory hair cells (HC) die and the spiral ganglion neurons (SGN) subsequently degenerate and die. To date, there is no potent curative or preventive solution for HI, the clinical options are based on the use of prostheses such as cochlear implants. Studies are being conducted to develop alternative treatments combining both preventive and reparative strategies. Since HC and SGN are of the same developmental origin, transcription and growth factors that modulate early development of the inner ear have been under the scope. These studies gave rise to two main therapeutic hypotheses, the use of exogenous stem cell with induction of their differentiation to HC and/or SGN, or the proliferation/transdifferentiation of cells supporting HC in the inner ear. Up to now, problems of cell death and control of the cell differentiation have slowed down the emergence of new therapies.

To address this problem, AFHELO projects plans to evaluate potency of AF243, a small molecule which is a strong inducer of cell differentiation with interesting potential on carcino-embryonic cells differentiation and neuron survival, and on an in vivo model of chemo-induced deafness, used for cochlear implant testing. The strategy is to optimize AF243 development by first extending the therapeutic applications to two major types of HI (noise-induced and age related/presbycusis) and second by completing the preclinical studies (pharmacology, mechanism of action, ADME, safety) supporting the clinical evaluation of AF243 for prevention and/or treatment of sensorineural HI.

Related information

Result In Brief

Pre-clinical study success for hearing loss

Report Summaries

Final Report Summary - AFHELO (Preclinical proof of concept of AF243 potency to prevent and/or treat sensorineural hearing loss)

News

EU-funded research breakthrough offers hope to millions with hearing impairments
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Subjects

Scientific Research

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