NeuroStemX- In vitro model of Fragile X Syndrome using naïve iPSCs

Neurological and mental disorders are top priorities for the European Commission, which actively invests in research aimed at better understanding brain function and dysfunction, and at finding new therapies for brain disorders. Fragile X syndrome (FXS) is the major monogenetic cause for intellectual disability and is frequently associated with autism spectrum disorder.
The trinucleotide repeat expansion, methylation and epigenetic silencing of fragile mental retardation 1 (FMR1) gene promoter leads to the loss of the corresponding protein. However, the molecular mechanism and the timing leading to FMR1 silencing are still unknown due to the absence of reliable in vivo and in vitro models. The recent development of naïve PSCs showing a broader unmethylated genome (including in FMR1) opened a new hope for disease modeling of FXS, but data are still partial and contradictory. The NeuroStemX project aims at filling this gap taking advantage of an optimized technique for the generation of naïve iPSCs developed at the University of Padova (UniPd) and generation of FXS neurons with various approaches mastered by the Experienced Researcher (ER) in conjunction with the microtechnologies developed by UniPd.
In particular, we aim at 1) identifying the timing of FMRP silencing during neural development using naïve iPSCs and 2) establishing a reliable in vitro system to model neuronal defects observed in FXS patients. In this project, we are addressing some of the most crucial problems related with FXS pathogenesis and modeling using a variety of innovative approaches.
This will give the ER an outstanding training-through-research opportunity by means of a personalized multidisciplinary project, in which the ER will enlarge her scientific competences and strengthen her professional profile. The training includes both scientific and transferable skills, aimed at the reinforcement of the ER professional maturity and independence.

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Find out more: https://cordis.europa.eu/project/rcn/222151/factsheet/en