# PhD student position

## Multimodal imaging to understand vulnerability for developing schizophrenia

Developmental Imaging and Psychopathology laboratory (DIPLab)

22q11.2 deletion syndrome (22q11DS) is the most common neurogenetic disorder in humans (1/2000 person). The frequent occurrence of psychotic symptoms and psychosis in the syndrome is one of its most distinctive features, making 22q11DS a genetic model for schizophrenia. In the recent years, a series of findings suggests that neurobiological changes, especially in the fronto-limbic system, with divergent developmental trajectories of hippocampal volume and its connectivity to frontal and dopaminergic brain areas, are preceding and co-occur with the emergence of psychosis in 22q11DS.
Currently our aims are to : 1) Identify critical periods and sequential changes occurring in the fronto-limbic system associated with emergence of psychotic symptoms; 2) Assess the impact of "second-hit" factors on altered neurodevelopmental trajectories and the emergence of psychosis; 3) Leverage on novel digital phenotyping techniques to develop cognitive, behavioral and clinical markers of vulnerability to psychosis that can be estimated remotely, over longer more representative time periods, in the ecological environment of individuals with 22q11DS.

Since 2001 the DIPLab has performed longitudinal follow-up in one of the largest cohorts of children and adolescents with 22q11DS. Our comprehensive research protocol consists in gold-standard neuroimaging acquisitions, including structural MRI, functional MRI and diffusion-weighted MRI as well as high-density EEG. Moreover, we perform extensive neuro-cognitive and clinical evaluations.

Methods employed in the lab: Cortical morphometry (thickness, gyrification), voxel-based DTI, tractography, resting-state fMRI, high-density EEG, graph theory, pattern recognition, multivariate pattern analysis.

Tools employed in the lab: Matlab, SPM, FSL, FreeSurfer, connectomemapper.

Place of work/date: Campus Biotech; Chemin des Mines; 9 - 1202  Geneva / **Starting in January 2023 or after**

Department: Department of Psychiatry, Faculty of Medicine, University of Geneva

Your responsibilities:

- To work in collaboration with clinical and engineering departments for the development and application of new neuroimaging and digital psychiatry methodologies.
- To analyze complex multimodal and longitudinal neuroimaging data.
- To participate to neuroimaging data or other pertinent data acquisition.
- Manuscript redaction.

Your Profile: We are looking for young, nearly graduated students with a master's degree in medicine, psychology, neurosciences, or an equivalent title. Expertise in programming and neuroimaging data analysis and management is not mandatory but a strong asset.

Application: Please send full application documents (motivation letter, CV, copy of the diploma and graduations, Optional: letter of recommendation) by a single email titled **"DIPLab PhD position application – YOUR NAME"** to the following email addresses:

Farnaz DELAVARI (farnaz.delavari@unige.ch)
Corrado SANDINI (corrado.sandini@unige.ch)
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