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TrauMAP

Features of exposure to childhood adversity in the insular cortex in MDD and PTSD

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Early life adversity is the strongest environmental risk factor for psychopathology and is associated with increased disorder severity, comorbidity, chronicity and treatment resistance. Determining the altered biology responsible for how early adversity raises risk of psychiatric disorders is key to develop interventions and treatments for a large portion of patients. The overall goal of this project is to identify molecular and cellular mechanisms of psychiatric risk in the insular cortex (insula) – a highly important brain area relevant to psychiatric disorders – to provide a springboard for accurate patient subtyping and personalised drug development. Firstly, we will deeply phenotype the human insula in neurotypical controls using single-cell, spatial transcriptomics and mass spectrometry imaging, and make this atlas freely available to the neuroscience community. We will then study a large sample of individuals with depression, PTSD and controls, with and without early adversity, to identify transcriptomic changes and biological clusters related to exposure and risk in the insular cortex. Lastly, we will validate the features driving the identified biological clusters using our single-cell and spatial omics approaches, providing functional insight into the genes, cell types and pathways affected. This innovative approach will contribute to the identification of new biological subtype-based treatment approaches for psychopathology, to overcome trial-and-error prescribing.