R-LiNK - Optimizing response to Li treatment through personalized evaluation of individuals with bipolar I disorder: the R-LiNK initiative

P.I.: Prof. Paolo Brambilla

Bipolar disorder (BD) is a prevalent mental disorder and a leading cause of suicide. Lithium (Li) is the key mood stabilizer for prevention of BD relapse and suicide. Whilst many cases become asymptomatic with Li treatment, the majority show sub-optimal response. Identifying biomarkers for predicting Liresponse would enable personalization of treatment, define criteria for stratification of BD cases and further refine the clinical response phenotype.

The objectives of this proposal are to (i) improve outcomes of bipolar I disorder (BDI) cases prescribed Li through the application of stratified approaches; (ii) optimize the early prediction of Li response using a set of multi-modal biomarkers ("blood omics", Magnetic Resonance Imaging and Li7-Magnetic Resonance Imaging derived-markers); (iii) develop a multidisciplinary multinational network of experts to undertake this and future projects on personalized diagnostics and therapeutics; and (iv) implement new, powerful technologies to characterize brain Li distribution and the blood molecular signature of Li in responders and non-responders.

This cutting edge approach will identify the eligibility criteria for treatment with Li in BD in terms of response, safety and tolerability. The assessment of each putative biomarker (singly and combined) will be guided by preliminary findings already obtained by R-LiNK; our expertise will allow exploratory analyses and innovative modelling of multi-modal data.

Likely impacts include improved outcomes and quality of life for BDI cases; development of a screening tool for clinicians; and an evaluation of the cost-effectiveness of this stratified approach. The network will develop new avenues of research on Li mechanisms of action and disease mechanisms; our industrial partnerships will enable development of medical devices to improve treatment adherence and patient's autonomy, diagnostic kits, and tools based on the molecular signature in treatment responders.