Peptide-Microarray Profiling of Maternal Synapsin Autoantibodies for Patients Stratification

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Maternal autoantibodies can impair synaptic function during neurodevelopment, particularly when the blood brain barrier is not fully formed[1]. Previous in vitro experiments have shown that patient-derived SYN1 monoclonals can enter neurons through FcγII/III-mediated endocytosis and cause functional impairment[2]. So far, the complex autoantibody repertoire remains unresolved and their single contribution in neurophysiology and neurodevelopment after transplacental exposure remains unclear[3].

In this study, we analysed the linear epitopes of 125 patients with SYN1 autoantibodies in µSPOT format[4]. We identified 23 distinct subgroups of epitopes, with one having higher prevalence (20%). Notably, patients with linear epitopes had a significantly increased risk of experiencing pregnancy complications. To further investigate these epitopes, we want to determine whether the identified epitope is a major driver of autoimmunity by applying the identified peptide on hippocampal neurons and brain section staining.

The implementation of µSPOT array used in this study has applicability in pregnancy screenings, allowing the prediction of autoantibody-mediated complications and thereby enabling timely interventions. In addition, the microarray mapping would enables affinity-purification of epitope-reactive autoantibodies and offers an alternative method to B-cell antibody isolation[5]. This could potentially lead to novel molecular insight on SYN1-autoantibody mediated diseases.

References:

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