

# Phosphodiesterase 10A IgG

## A novel biomarker of paraneoplastic neurologic autoimmunity

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### Study objective and summary result

This study aimed to describe a novel antiphosphodiesterase 10A (PDE10A) autoantibody that serves as a biomarker for paraneoplastic neurologic autoimmunity. PDE10A autoimmunity is likely rare and the majority of patients presented with movement disorders.

### What is known and what this paper adds

Various autoimmune movement disorders have been described in a paraneoplastic context. This investigation reports a novel biomarker for autoimmune movement disorders that expands the spectrum of diagnosable paraneoplastic CNS disorders.

### Participants and setting

The investigators examined the cases of 7 patients (4 men; median age, 70 years; age range, 66–76 years) for whom sera or CSF underwent testing at the Mayo Clinic Neuroimmunology Laboratory (Rochester, MN) and yielded a distinctive immunoglobulin G (IgG) staining pattern predominantly of the basal ganglia when applied to murine brain tissue. Five patients were retrospectively identified in the Mayo Clinic Neuroimmunology Laboratory database, and 2 were prospectively identified.

### Design, size, and duration

The patients' clinical data were extracted from electronic files ( $n = 1$ ) or provided by referring physicians ( $n = 6$ ). Immunoprecipitation of pig basal ganglia extractions with the patients' autoantibodies and mass spectrometry were used to identify the antigen. The specificity was confirmed with antigen-specific recombinant western blotting, cell-based immunofluorescence assays, and immune absorption experiments.

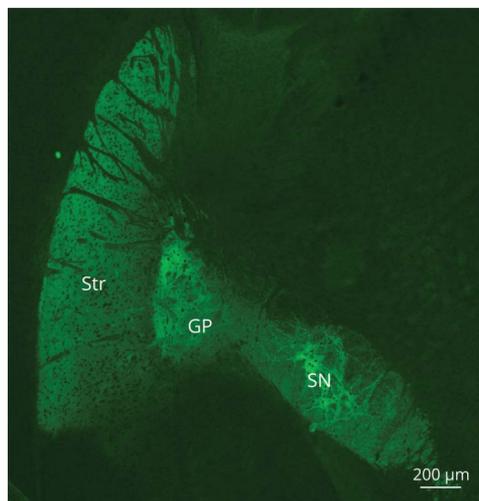
### Primary outcome measures

Identification of the antigen of interest and the patients' clinical presentation.

### Main results and the role of chance

PDE10A was identified as the antigen of interest. Four patients had documented movement disorders, and 6 had cancer. Two patients developed hyperkinetic movement disorders during treatment with immune checkpoint inhibitors for their cancer. MRI

**Figure** Indirect immunofluorescence assay performed on murine tissue with patient serum demonstrates synaptic staining of the basal ganglia



assessments with fluid-attenuated inversion-recovery and T2-weighted sequences revealed basal ganglia hyperintensities in these 2 patients and CSF-restricted oligoclonal bands were present.

### Bias, confounding, and other reasons for caution

A small group of patients were assessed in this study and limited clinical data were available for 5 patients.

### Generalizability to other populations

The rarity of this disorder may limit the generalizability of the results.

### Study funding/potential competing interests

This study was supported by the Center for Individualized Medicine, Mayo Clinic. Some authors report having filed patent applications related to anti-PDE10A autoimmunity, having licensing and patent interests in anti-aquaporin-4 autoimmunity in the context of neuromyelitis optica, receiving research support from various healthcare companies, and consulting for various healthcare companies. Go to [Neurology.org/N](http://Neurology.org/N) for full disclosures.

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