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LETTER TO THE EDITOR

Central European Group on Genetics of Movement Disorders

Over the last two decades, we have witnessed major developments in neurogenetic research, the aetiopathogenesis and possible treatment options. Although substantial progress has been made, the first genome-wide studies have explained relatively little of the heritability of most complex traits, leading to a theory that a more fine-scale analysis considering the characteristics of individual populations may hold the key to the missing heritability.

In contrast to the Western part of Europe, where the genetics of movement disorders have been thoroughly studied, genetic reports from patients of Central European ancestry have been scarce as cohorts from this region were rarely included and their genetic background remains unknown. Therefore, the Central European Group on Genetics of Movement Disorders (CEGEMOD) has been established to address this gap, representing a collaboration between nine tertiary movement disorder centres from Slovakia, Czech Republic, Poland and Hungary (Figure 1 and Appendix). The CEGEMOD consortium aims to create a collaborative network that will establish a Central European based registry of movement disorder patients, with focus on Parkinson's disease (PD): atypical parkinsonism such as multiple system atrophy, progressive supranuclear palsy, Lewy body dementia and corticobasal syndrome; prodromal PD (with and without rapid eye movement sleep behaviour disorder) [1] and ataxia. The emphasis is on building a framework for future collaborative studies that will lead to the identification of genetic risk factors and to explore the genotype–phenotype correlations (disease subtypes, age at onset, motor and non-motor symptoms), leading to the investigation of new, population-based diagnostic and therapeutic interventions. To achieve this goal, we have established a partnership with the Institute of Neurology, University College London, UK,

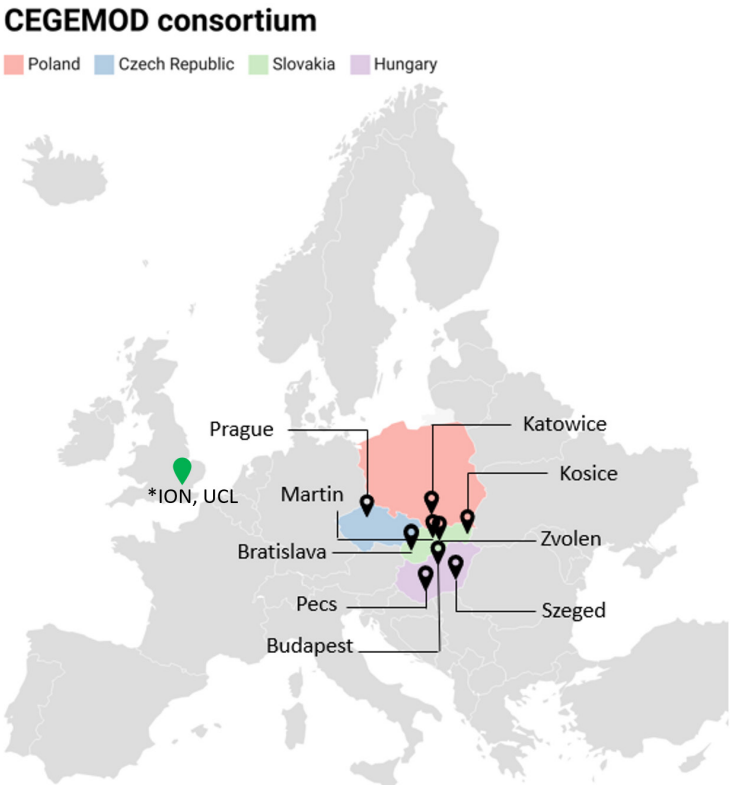

FIGURE 1 Central European Group on Genetics of Movement Disorders (CEGEMOD). *UCL, ION, Institute of Neurology, University College London, UK, as central technical training hub.

for their technical support to enable the development of local facilities through education and training.

To date, nearly 3500 individuals have been enrolled, making our consortium the largest ethnically matched case–control cohort of Central Europe (Table S1). Each site uses uniform diagnostic criteria and collects a standardized set of clinical and demographic variables.

Our pilot study assessing the contribution of rare *LRRK2* pathogenic variants to PD confirmed that most *LRRK2* variants which are pathogenic in PD in North and West Europe are not a frequent cause of PD in Central Europe. Additionally, we identified a c.1256C>T (p.Ala419Val) *LRRK2* variant that is highly population-specific and mostly observed in South and East Asians, in two PD patients of Hungarian origin [2]. These findings highlight the potential difference of ethnic background across European countries considering migration patterns, settled ethnic minorities and their genetic influence. The largest ethnic minority of Central Europe, the Roma population, has already been shown to have a common South Asian genetic origin [3] and to harbour several rare disease-causing variants, although a genetic background of parkinsonism and ataxia specifically has never been studied in this population. Correspondingly, in a related project aimed at the genetics of dystonia, we have already identified two novel founder mutations in this population—the *VPS16* c.559C>T (p.Arg187*) recurrent variant present only in the Roma population [4] and the *WARS2* exon 2 deletion reported only in subjects of Slovak origin so far [5].

AUTHOR CONTRIBUTIONS

Miriam Ostrozovicova: Conceptualization; project administration; writing – original draft; investigation. **Petr Dusek:** Conceptualization; investigation; resources; writing – review and editing. **Milan Grofik:** Conceptualization; investigation; resources; writing – review and editing. **Vladimir Han:** Conceptualization; investigation; writing – review and editing; resources. **Petr Holly:** Conceptualization; investigation; writing – review and editing; resources. **Robert Jech:** Conceptualization; investigation; resources; writing – review and editing. **Peter Klivenyi:** Conceptualization; investigation; resources; writing – review and editing. **Norbert Kovacs:** Conceptualization; investigation; resources; writing – review and editing. **Kristina Kulcsarova:** Conceptualization; investigation; resources; writing – review and editing. **Egon Kurca:** Conceptualization; investigation; resources; writing – review and editing. **Alexandra Lackova:** Conceptualization; investigation; resources; writing – review and editing. **Veronika Magocova:** Conceptualization; investigation; resources; writing – review and editing. **Jan Necpal:** Conceptualization; investigation; writing – review and editing; resources. **David Pinter:** Investigation; conceptualization; writing – review and editing; resources. **Evzen Ruzicka:** Conceptualization; investigation; resources; writing – review and editing. **Tereza Serranova:** Conceptualization; resources; writing – review and editing; investigation. **Katarzyna Smilowska:** Conceptualization; investigation; resources; writing – review and editing. **Igor Straka:** Conceptualization; investigation; resources; writing – review and editing. **Tatiana Svorenova:** Conceptualization; investigation; resources; writing – review and editing. **Gertrud Tamas:** Conceptualization; investigation; resources; writing – review and editing. **Peter Valkovic:** Conceptualization; investigation; resources; writing – review and editing. **Katerina Zarubova:** Conceptualization; investigation; resources; writing – review and editing. **Henry Houlden:** Writing – review and editing; conceptualization; project administration; supervision; resources. **Mie Rizig:** Conceptualization; project administration; supervision; resources; writing – original draft. **Matej Skorvanek:** Conceptualization; writing – original draft; project administration; funding acquisition; investigation; resources.

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CONFLICT OF INTEREST STATEMENT

None of the authors have a conflict of interest to disclose.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

APPENDIX

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