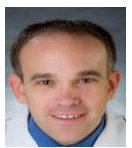


Towards Precision Medicine in Parkinson's Disease



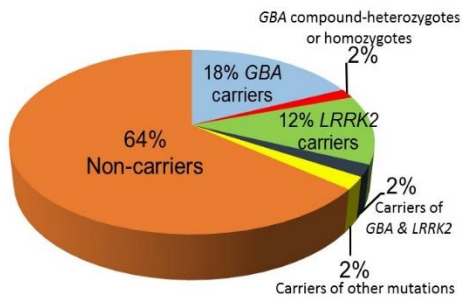
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Genetic Laboratory (Orr-Urtreger)

- Identify Mutation carriers in *GBA* and *LRRK2* (>33% of Ashkenazi Jews)
- Identify genetic modifiers of Parkinson's disease (PD) that increase or decrease PD risk or severity



GBA and *LRRK2* mutations in Ashkenazi Jews with PD



Movement Disorders Unit, Clinical Trials (Gurevich)

- Ongoing clinical trials for precision medicine studies in *LRRK2* and *GBA*. Examples:
- Intrathecal antisense oligonucleotides for *LRRK2*-PD
- Gene therapy using AAV vector for *GBA*-PD



From bench to bedside

Personalized Cures



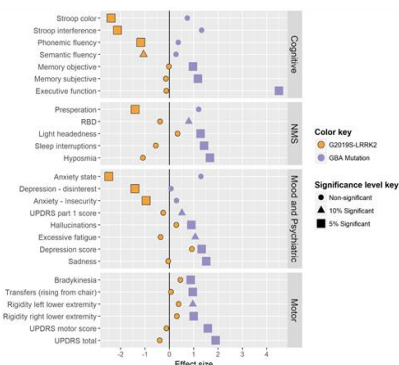
Laboratory for Early Markers of Neurodegeneration (LEMON) (Mirelman)

- Genotype/phenotype studies of carriers of *LRRK2* and *GBA* with and without PD (imaging, wearables and clinical)
- Biological markers of *GBA* and *LRRK2* in blood, urine, and spinal fluids

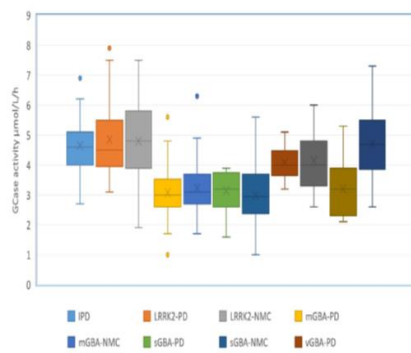


Phenotype: Center for the Study of Movement Cognition and Mobility (Hausdorff)

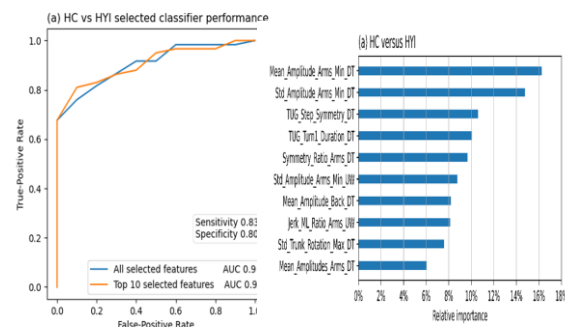
- Deep phenotyping of gait performance
- Analysis and treatment of freezing of gait and other gait disorders



Clinical phenotype of mutation carriers



Glucocerebrosidase activity by mutation status



Sensitive measures of gait distinguishing early PD from healthy controls