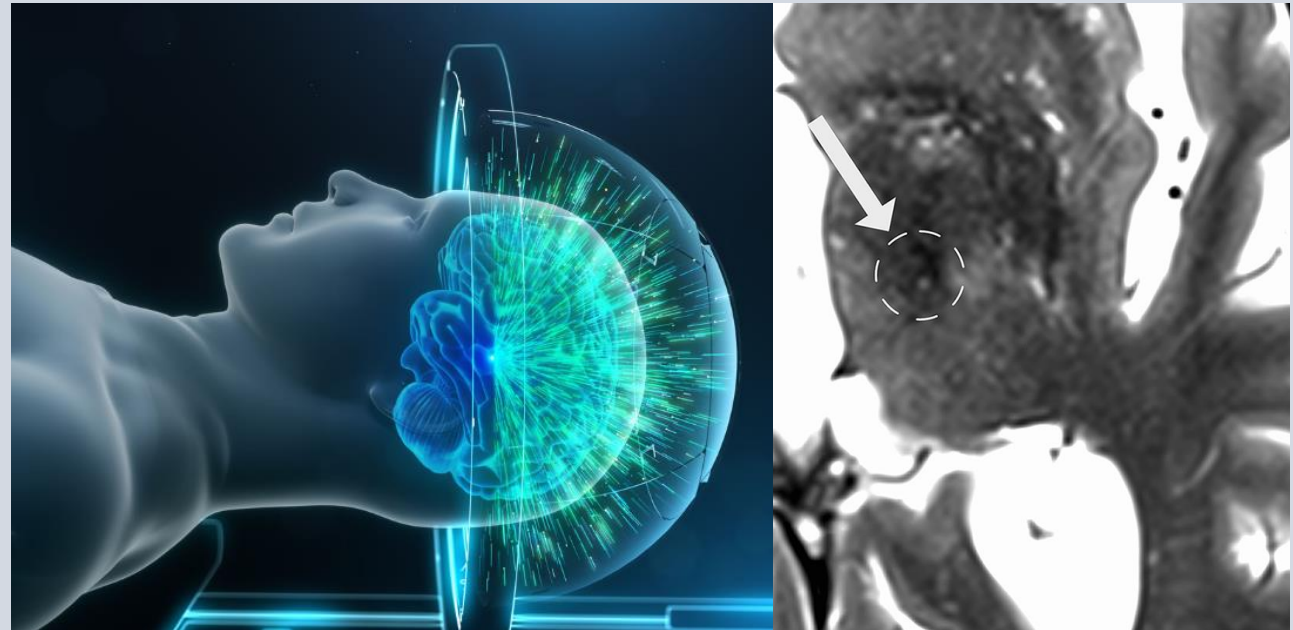


Turku BrainLab

Cutting edge clinical neuroscience

Juho Joutsa, MD, PhD

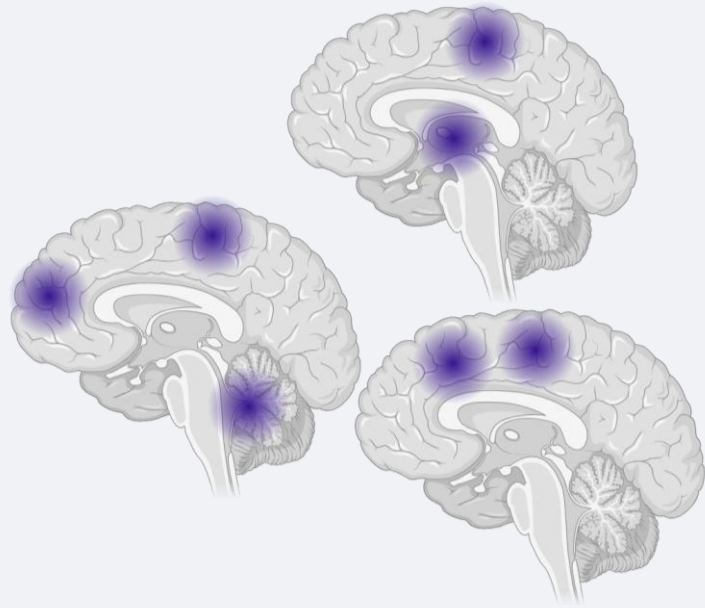
Professor of Neurology, University of Turku
Chief Neurologist, Turku University Hospital
Chair, Turku Brain and Mind Center
juho.joutsa@utu.fi



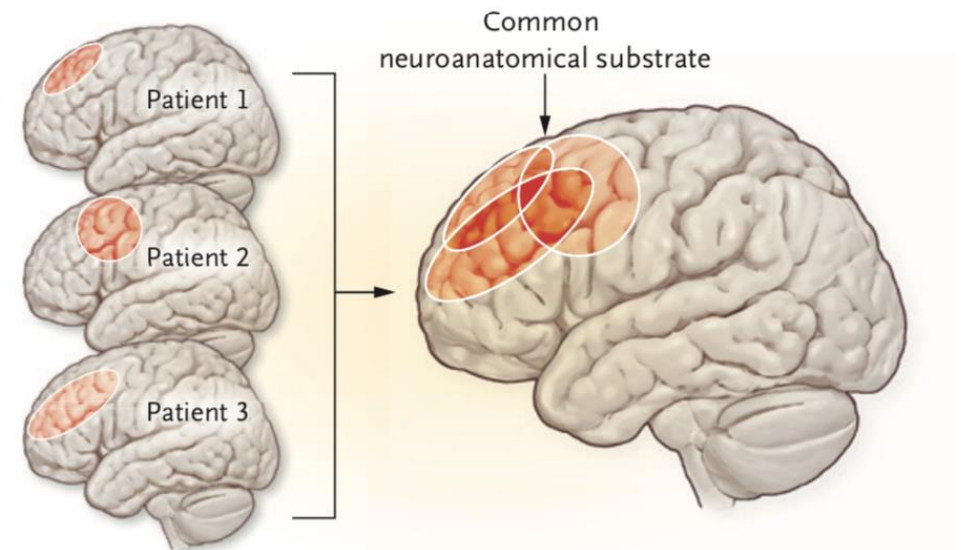


How to localize symptoms & treatment targets?

Results from case-control are heterogeneous



Brain lesions provide causal inference



Fox. N Engl J Med 2018



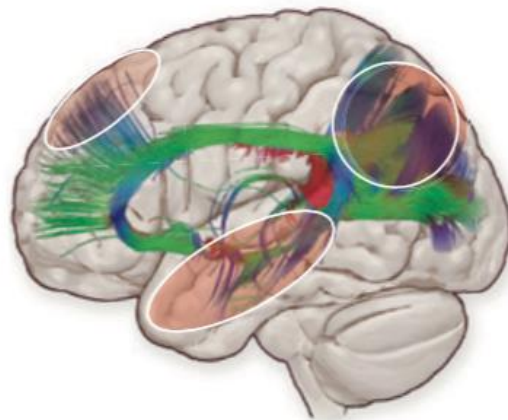
Main line of research

From lesions to brain networks and treatment

A Lesions Causing the Same Symptom



B Map of Anatomical Connectivity



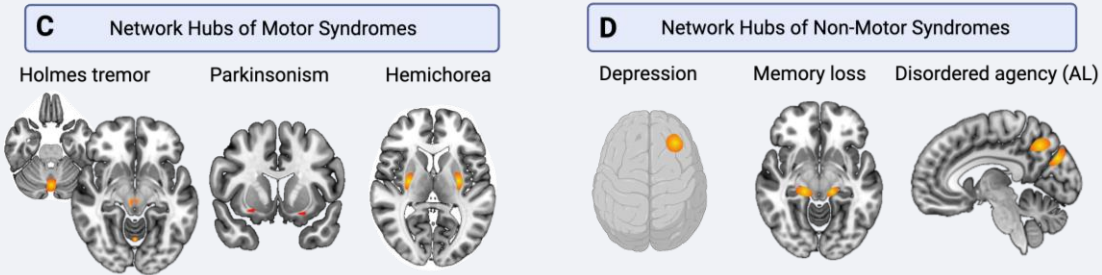
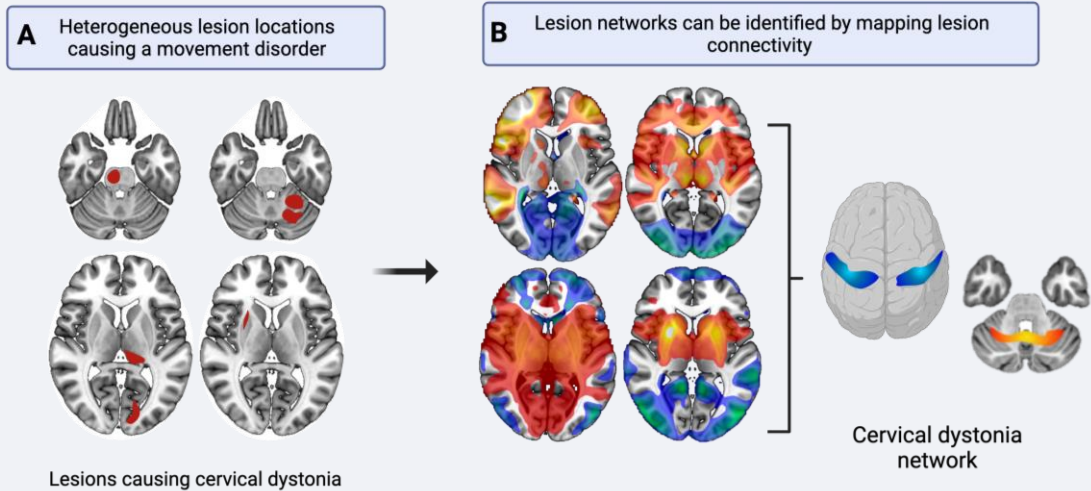
Fox. N Engl J Med 2018



100 billion neurons
100,000 billion connections



From lesions to networks



From: Ellis et al., *submitted*

Major findings

- Amyloid in epilepsy, 50y follow-up (*JAMA Neurol* 2017)
- Parkinsonism (*Brain* 2018)
- Akinetic mutism (*PNAS* 2018)
- Alien limb (*PNAS* 2018)
- Targets based on lesions (*Ann Neurol* 2018)
- Cervical dystonia (*Brain*, 2019)
- Depression (*Biol Psychiatry* 2019)
- Holmes tremor (*Ann Neurol* 2019)
- Migraine (*Brain* 2020)
- Hallucinations (*Mol Psychiatry* 2021)
- Central pain (*Ann Neurol* 2022)
- STN-DBS side-effects (*Brain* 2022)
- Dystonias (*Neurology* 2022)
- Addiction remission (*Nat Med* 2022)
- Epileptic seizures (*JAMA Neurol* 2023)
- Essential tremor (*Neurology* 2023)
- GPi-DBS networks (*JNNP* 2023)
- Amusia (*Submitted*)
- Stuttering (*Submitted*)
- Fatigue (*Submitted*)
- Ataxia (*Submitted*)
- Neglect (*Manuscript*)
- Hemichorea (*Manuscript*)
- Amyloid in epilepsy, 55y follow-up (*Submitted*)

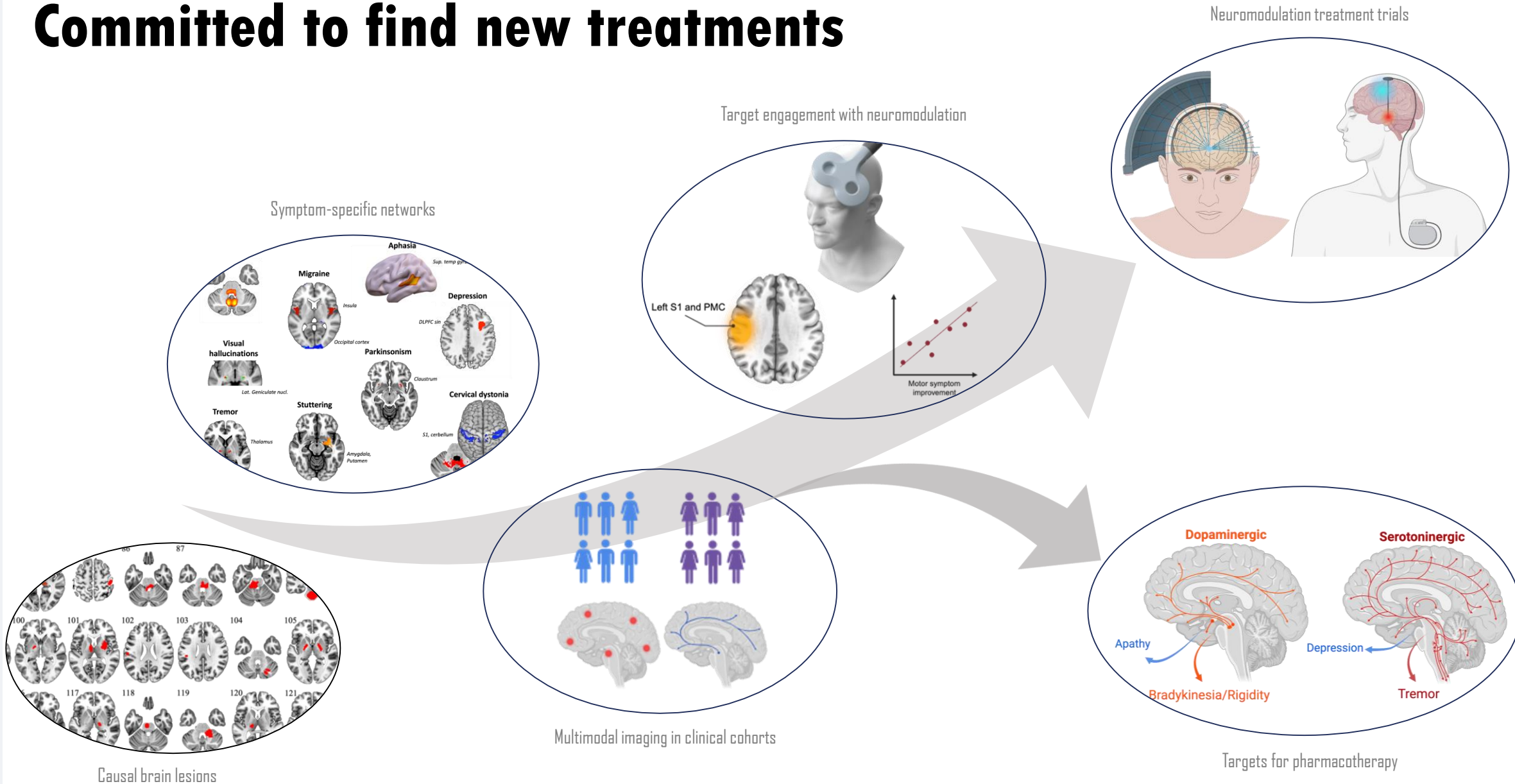
Addiction target



nature
medicine



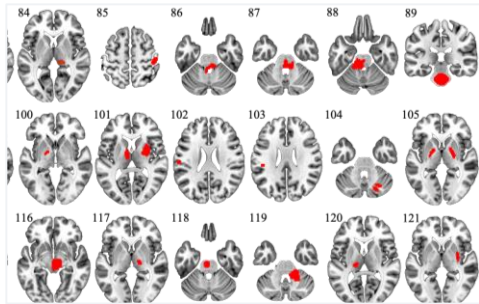
Committed to find new treatments





Currently >10 ongoing projects

UNIQUE LESION DATASETS



BRAIN

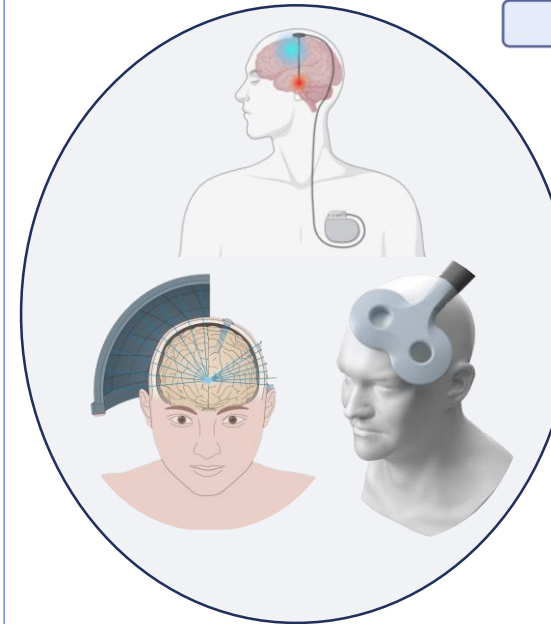
World largest prospective lesion network mapping study, 100+ neu/psy symptoms



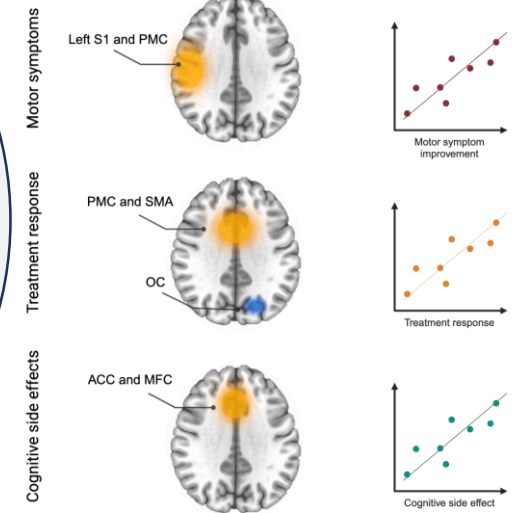
PSMD

Multicenter study → diagnostic criteria, clinical guidelines & training program

NEUROMODULATION



Symptom-specific networks identified using DBS-PET imaging





Turku BrainLab team







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