

Juho Joutsa, MD/PhD

Assoc prof, neurologist

24.5.2023





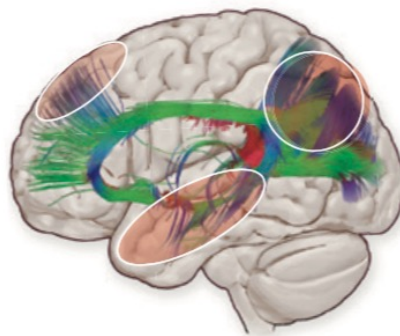
# Main line of research

From lesions to **brain networks** and treatment

A Lesions Causing the Same Symptom



B Map of Anatomical Connectivity



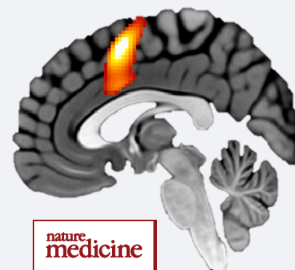
*Fox. N Engl J Med 2018*





## Major findings

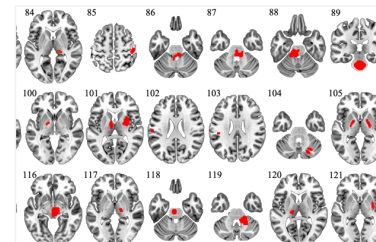
- Parkinsonism** (*Brain* 2018)
- Akinetic mutism** (*PNAS* 2018)
- Alien limb** (*PNAS* 2018)
- Essential tremor** (*Ann Neurol* 2018)
- Cervical dystonia** (*Brain*, 2019)
- Depression** (*Biol Psychiatry* 2019)
- Dementia** (*Brain* 2019)
- Holmes tremor** (*Ann Neurol* 2019)
- Migraine** (*Brain* 2020)
- Hallucinations** (*Mol Psychiatry* 2021)
- Central pain** (*Ann Neurol* 2022)
- DBS side effects** (*Brain* 2022)
- Dystonias** (*Neurology* 2022)
- Addiction remission** (*Nat Med* 2022)
- Epileptic seizures** (*JAMA neurol* 2023)
- Amusia** (*Submitted*)
- Stuttering** (*Submitted*)
- Ataxia** (*Manuscript*)
- Fatigue** (*Manuscript*)
- Neglect** (*Manuscript*)



Current state

## Current research

10 ongoing research projects on neurological and psychiatric disorders



### BRAIN

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



### PSMD

Multicenter study → diagnostic criteria, clinical guidelines & training program



Current state

## Current job description(s)



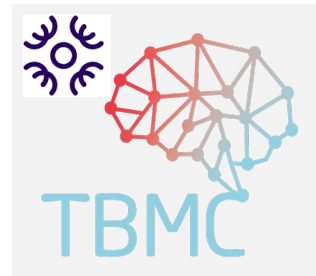
### Tenure track

ASSOC PROF  
Neuroimaging



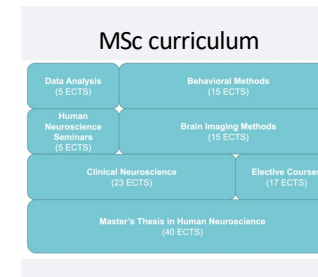
### Turku Brainlab

DIRECTOR  
30+ person research lab



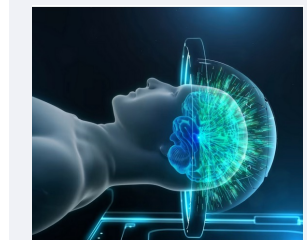
### Turku Brain & Mind Center

CHAIR  
Neurocenter Finland



### Human Neuroscience

HEAD OF PROGRAM  
Internat. Master's program



### Clinical work

NEUROLOGIST  
Turku Univ. Hospital (25%)



# Keys for an academic career & road to my path?

“Chance favors the prepared mind”  
*Louis Pasteur*



Methods & effort

Learning is the key



Perseverance

Don't give up, rethink



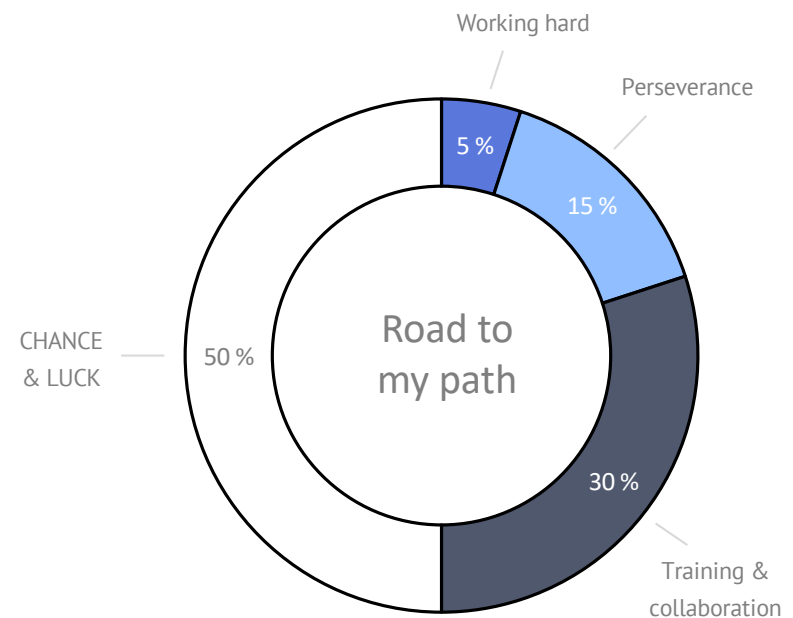
Teamwork

Together is always better



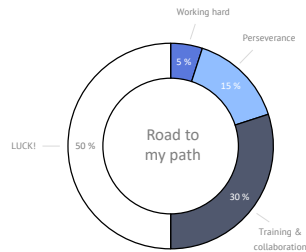
High aims

Think outside of the box





# Training phase



## Doctoral researcher

- Methodological skills
- Writing / presenting
- Pave the way for future



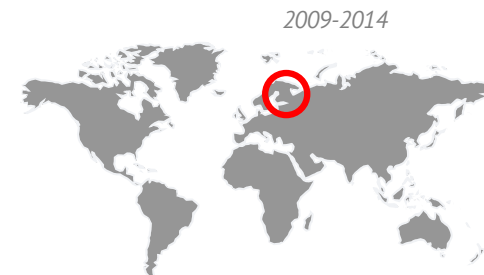
## Postdoc

- Expanding the skills set
- Understanding "the game"
- Networking



## After postdoc

- Faculty, funding & group
- Finding your niche
- International recognition



University of Turku

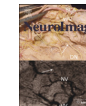
NeuroImage 60 (2012) 1992–1999



Contents lists available at SciVerse ScienceDirect

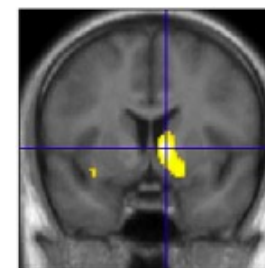
NeuroImage

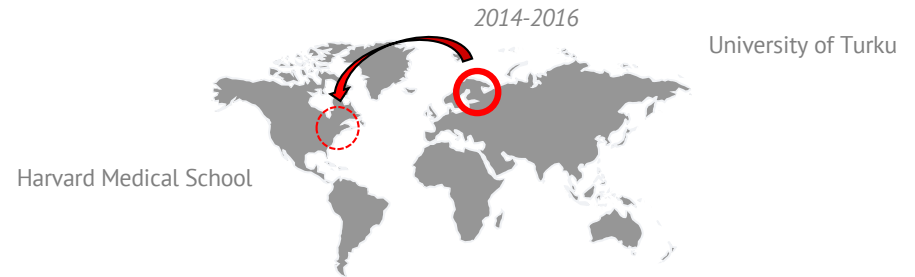
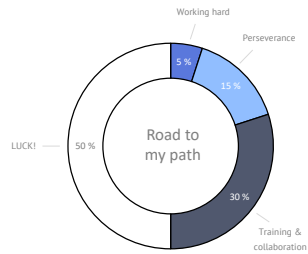
journal homepage: [www.elsevier.com/locate/ynimg](http://www.elsevier.com/locate/ynimg)



## Mesolimbic dopamine release is linked to symptom severity in pathological gambling

Juho Joutsa <sup>a,b,c,\*</sup>, Jarkko Johansson <sup>b</sup>, Solja Niemelä <sup>d</sup>, Antti Ollikainen <sup>e</sup>, Mika M. Hirvonen <sup>b,f</sup>,  
 Petteri Piepponen <sup>g</sup>, Eveliina Arponen <sup>b</sup>, Hannu Alho <sup>h,i</sup>, Valerie Voon <sup>l</sup>, Juha O. Rinne <sup>b</sup>,  
 Jarmo Hietala <sup>d</sup>, Valtteri Kaasinen <sup>a,b</sup>





# Training phase



## Doctoral researcher

Methodological skills  
Writing / presenting  
Pave the way for future



## Postdoc

Expanding the skills set  
Understanding "the game"  
Networking

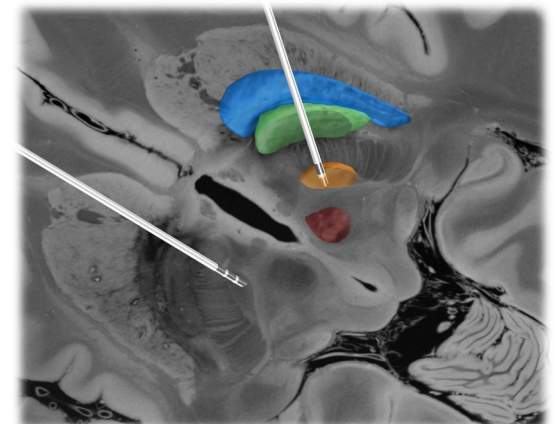


## After postdoc

Faculty, funding & group  
Finding your niche  
International recognition



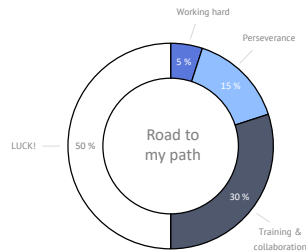
*Transcranial magnetic stimulation (TMS)*



*Deep brain stimulation (DBS)*



# Training phase



## Doctoral researcher

- Methodological skills
- Writing / presenting
- Pave the way for future



## Postdoc

- Expanding the skills set
- Understanding "the game"
- Networking



## After postdoc

- Faculty, funding & group
- Finding your niche
- International recognition



doi:10.1093/brain/awy161 BRAIN 2018: Page 1 of 12 | 1

**BRAIN**  
A JOURNAL OF NEUROLOGY

doi:10.1093/brain/awz112 BRAIN 2019: 142, 1660-1674 | 1660

**BRAIN**

doi:10.1093/brain/awz292 BRAIN 2019: 142, 70-79 | 70

**BRAIN**  
A JOURNAL OF NEUROLOGY

**onia based**

doi:10.1093/brain/awz405 BRAIN 2020: 143, 541-553 | 541

**BRAIN**  
A JOURNAL OF NEUROLOGY

**Network lo  
neuroimagi**

**R. Ryan Darby,<sup>1,2,3</sup> Juho**

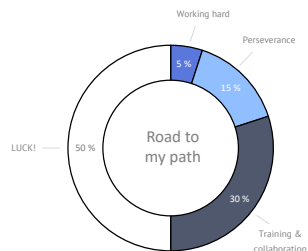
**Mapping migraine to a common brain network**

**Matthew J. Burke,<sup>1,2,3</sup> Juho Joutsa,<sup>1,4,5</sup> Alexander L. Cohen,<sup>1,6</sup> Louis Soussand,<sup>1</sup>  
Danielle Cooke,<sup>1</sup> Rami Burstein<sup>7</sup> and Michael D. Fox<sup>1,8,9</sup>**





# Transition phase



## Doctoral researcher

Methodological skills  
Writing / presenting  
Pave the way for future



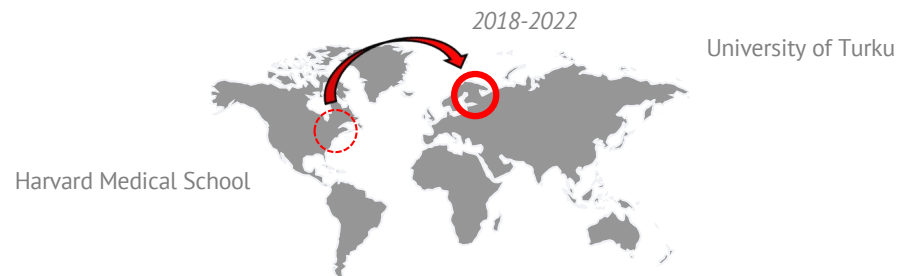
## Postdoc

Expanding the skills set  
Understanding "the game"  
Networking



## After postdoc

Faculty, funding & group  
Finding your niche  
International recognition



<https://doi.org/10.1093/brain/awad123>

BRAIN 2023; 00; 1-10 | 1

# BRAIN

UPDATE



## The return of the lesion for localization and therapy

Juho Joutsa,<sup>1,2,3</sup> Nir Lipsman,<sup>4,5,6</sup> Andreas Horn,<sup>3,7,8,9</sup> G. Rees Cosgrove<sup>3,10</sup> and Michael D. Fox<sup>3,8,11</sup>

RESEARCH ARTICLE

## Clinical and Structural Findings in Patients With Lesion-Induced Dystonia

Descriptive and Quantitative Analysis of Published Cases

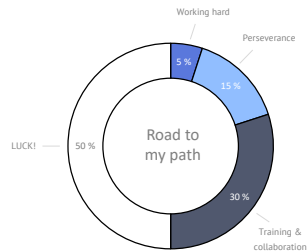
Daniel T. Corp, PhD, Christopher J. Greenwood, PhD, Jordan Morrison-Ham, BS, Jaakko Pullinen, MD, Georgia M. McDowall, BS, Ellen F. P. Younger, BS, Hyder A. Jinnah, MD, Michael D. Fox, MD, PhD, and Juho Joutsa, MD, PhD

**Correspondence**  
Dr. Corp  
[daniel.corp@deakin.edu.au](mailto:daniel.corp@deakin.edu.au)

*Neurology*® 2022;99:e1957-e1967. doi:10.1212/WNL.0000000000201042



# Independent phase



## Doctoral researcher

Methodological skills  
Writing / presenting  
Pave the way for future



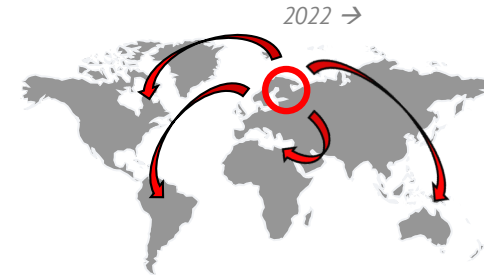
## Postdoc

Expanding the skills set  
Understanding "the game"  
Networking



## After postdoc

Faculty, funding & group  
Finding your niche  
International recognition



University of Turku



OPEN

## Brain lesions disrupting addiction map to a common human brain circuit

Juho Joutsa<sup>1,2,3,17</sup>, Khaled Moussawi<sup>4,5,17</sup>, Shan H. Siddiqi<sup>3,6,17</sup>, Amir Abdolahi<sup>7</sup>, William Drew<sup>3,6</sup>, Alexander L. Cohen<sup>3,6,8,9</sup>, Thomas J. Ross<sup>4</sup>, Harshwardhan U. Deshpande<sup>4</sup>, Henry Z. Wang<sup>10</sup>, Joel Bruss<sup>11</sup>, Elliot A. Stein<sup>4</sup>, Nora D. Volkow<sup>16</sup>, Jordan H. Grafman<sup>12,13,14</sup>, Edwin van Wijngaarden<sup>15</sup>, Aaron D. Boes<sup>11</sup> and Michael D. Fox<sup>3,6</sup>

### *They Were Cigarette Smokers. Then a Stroke Vanquished Their Addiction.*

Patients whose brain injury coincidentally relieved their nicotine cravings may help unravel the neural underpinnings of addiction, a new study suggests.

**The New York Times**



TURKUBRAINLAB

Est. 2018

# Independent phase



## Multimodal

Clinical, MRI, PET, SPECT,  
EMG, PAT, TMS, DBS, HIFU



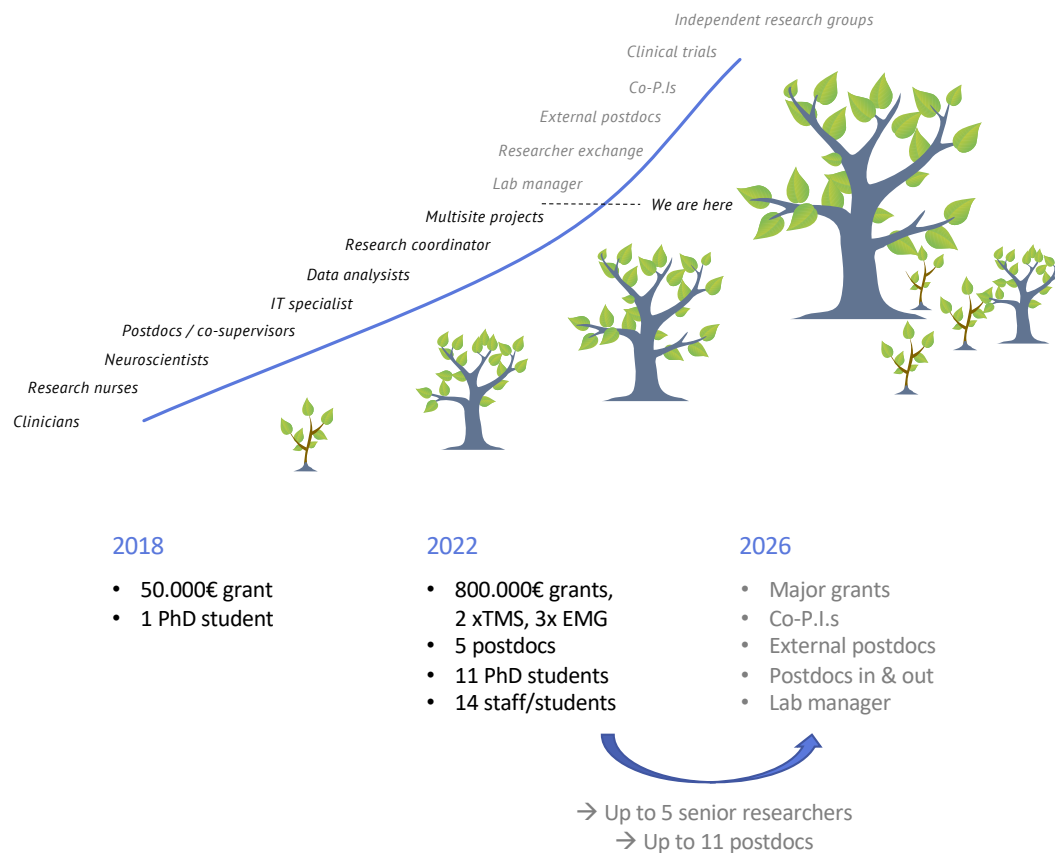
## Interdisciplinary

Between and  
combining disciplines



## Quality, not quantity

Scientific/clinical relevance,

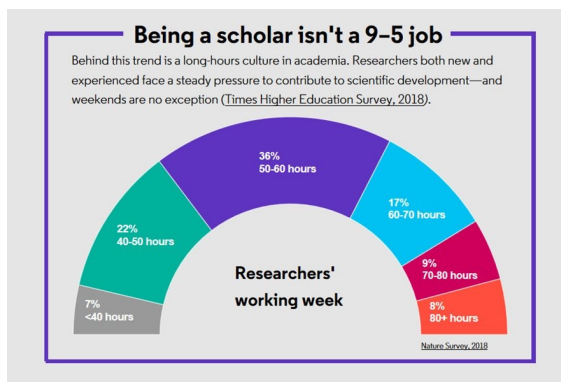




# How to combine clinical work?

2009-2016	5/6 years of residency
2016-2018	Boston (observing at HMS)
2018-2019	On-call only (Academy of Finland)
2019-2020	Last year of residency (assist. prof.)
2020-	TYKS, part-time (mov disord, neuromodulation) Kaarina, consultant (general neurology)

“Work smarter, not <sup>just</sup> harder”



2009

M.D. + start of residency

2020

Medical specialist in neurology

Current

Turku University Hospital  
Kaarina Healthcare center



**TURUN  
YLIOPISTO**