



**The
Healthy
Brain
Initiative**

The Healthy Brain Initiative

Radboud Universiteit

Radboudumc

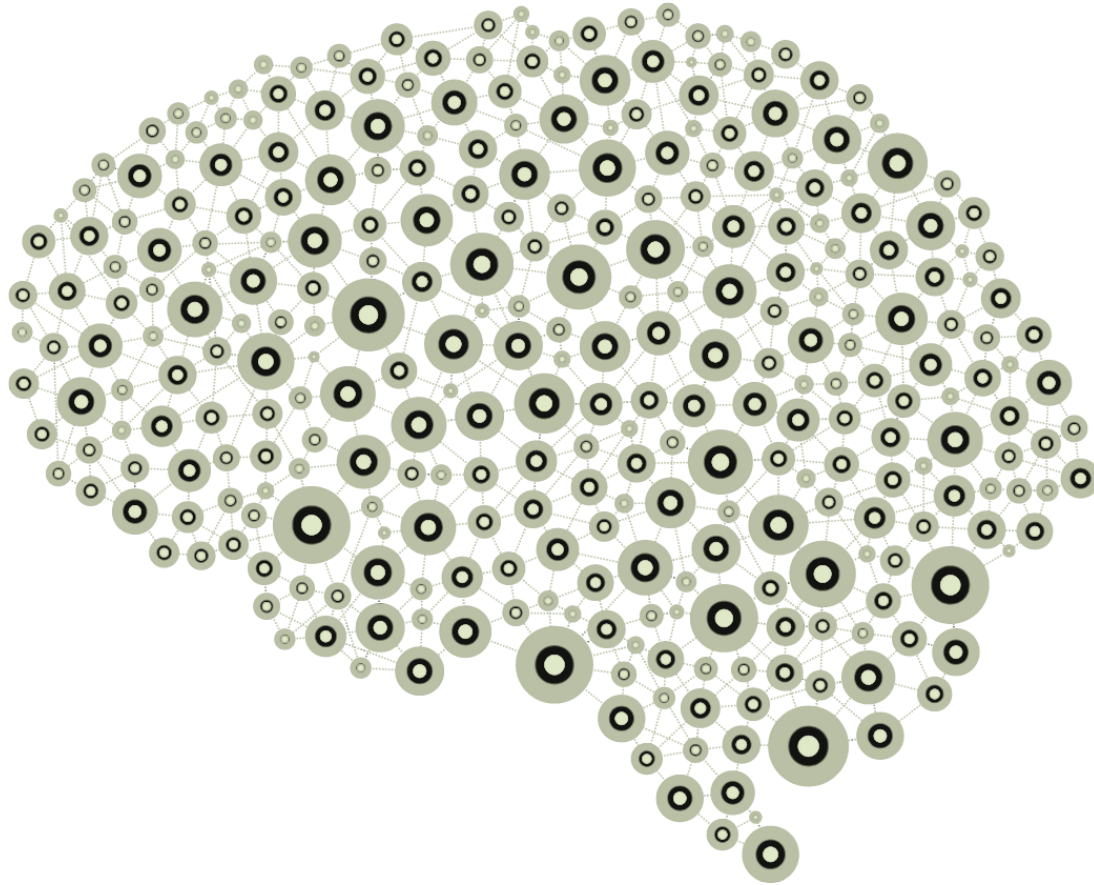
MAX PLANCK INSTITUTE
FOR **PSYCHOLINGUISTICS**

A Human Being



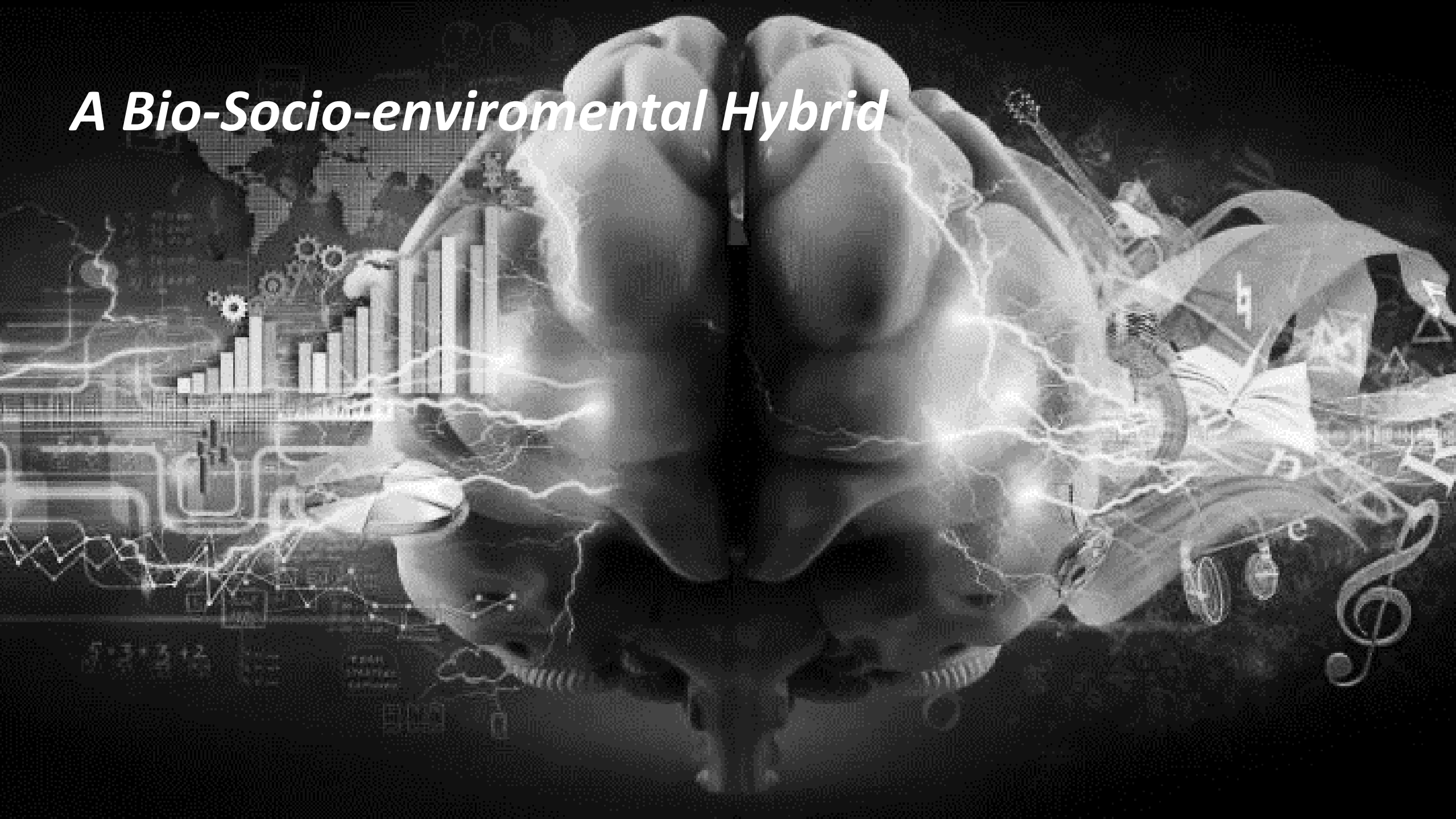


His Brain



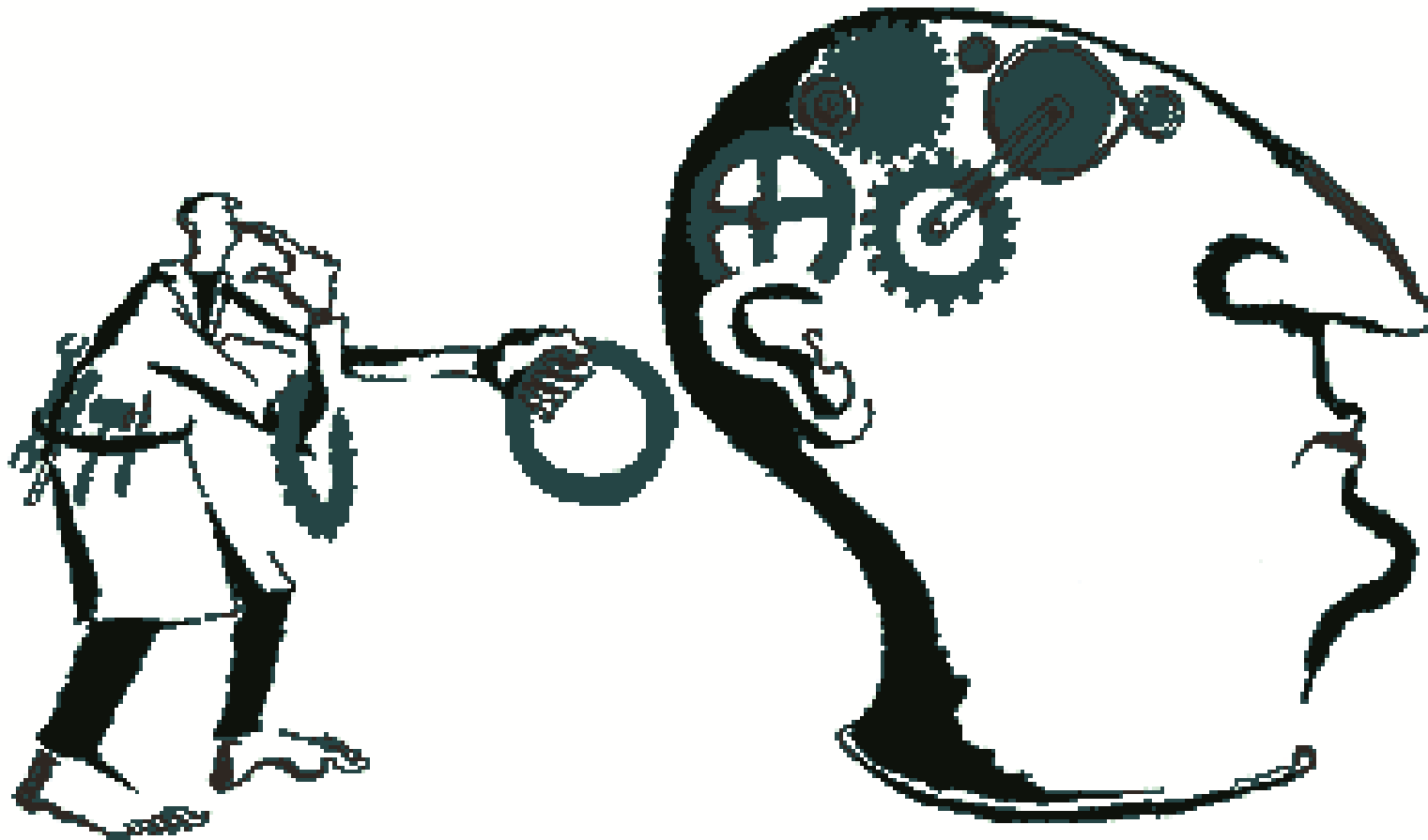
- It is the most individual organ
- It has almost 100 billion neurons with about one quadrillion connections
- It works a million times more energy efficient than a computer
- Preserving its health helps avoiding the most burdensome diseases

A Bio-Socio-environmental Hybrid





But how does it work?



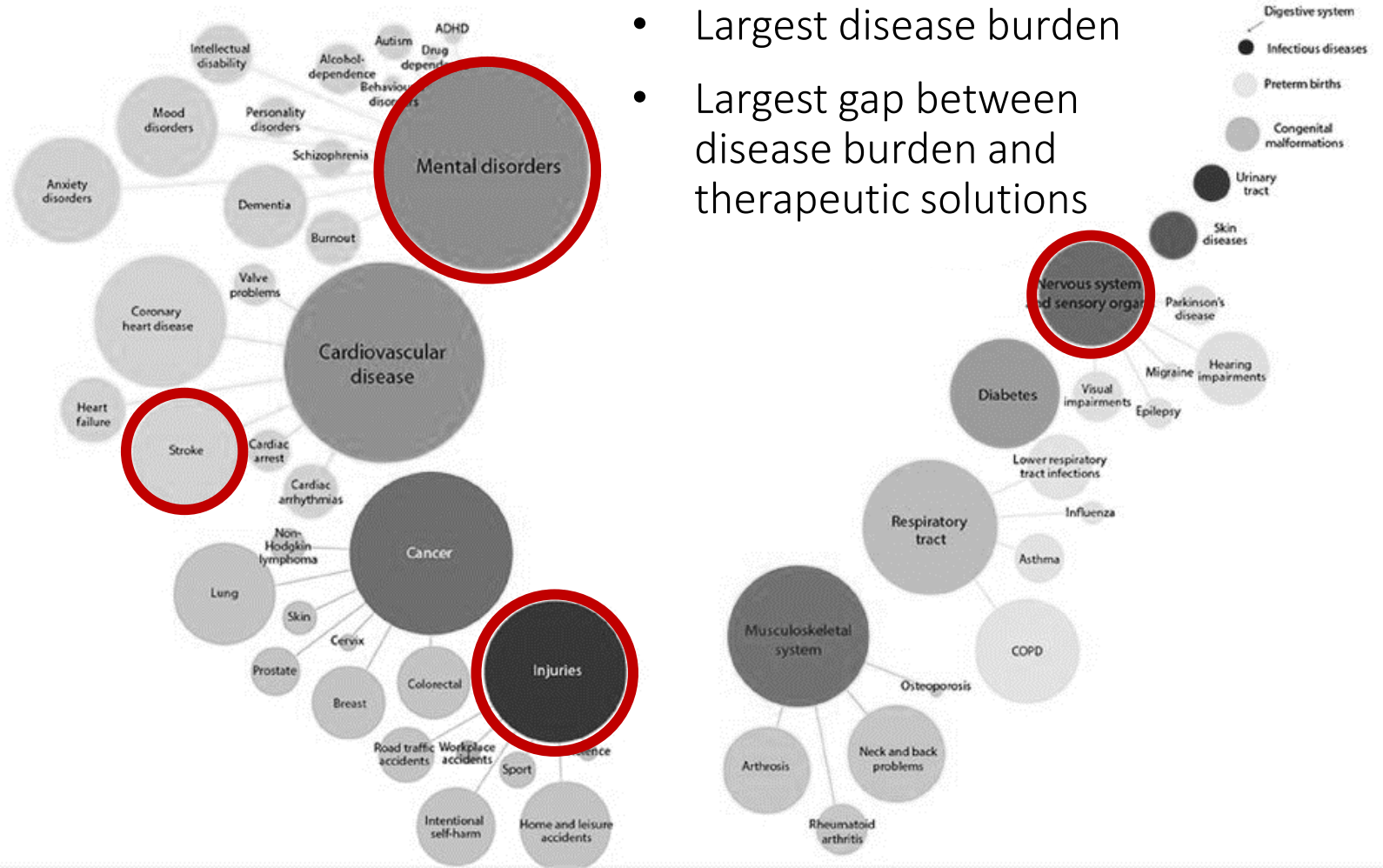


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Unmet Need in Health Care

Brain-based disorders

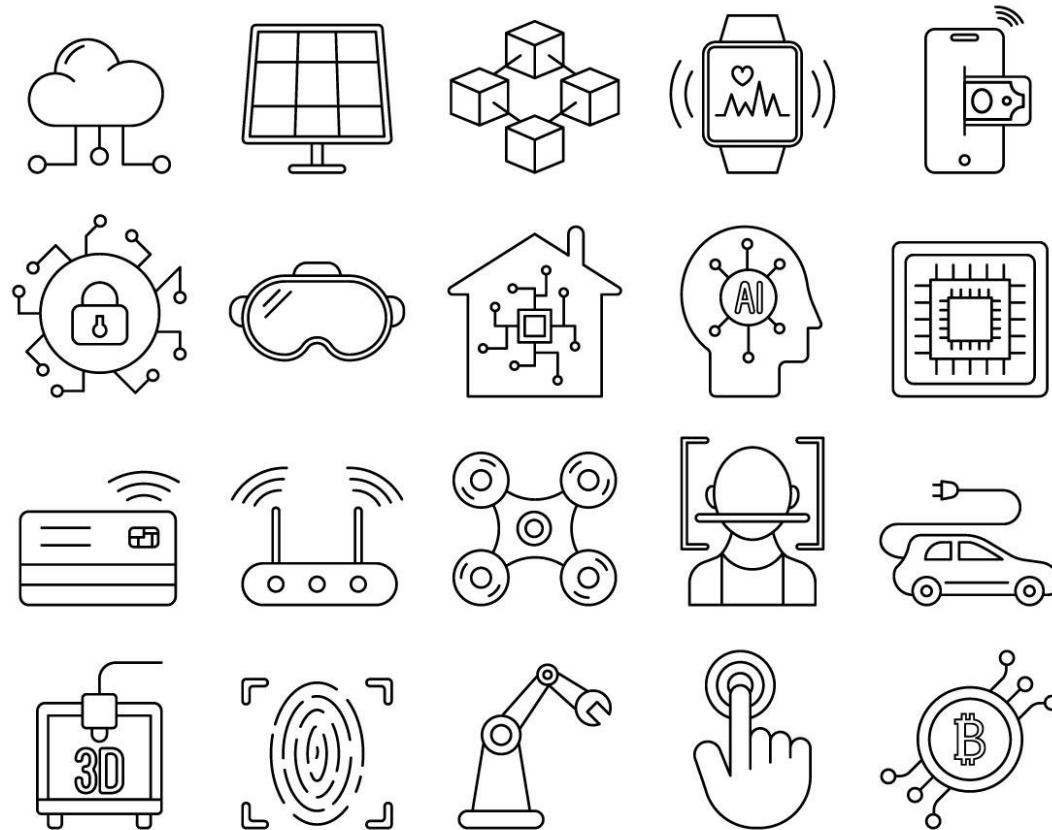
- Largest disease burden
- Largest gap between disease burden and therapeutic solutions





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Unmet Need in Technology





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Unmet Need in Education





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Unmet Need in Society at Large





“The human brain is civilization's most precious resource. Investment in brain sciences is, therefore, an investment in the future of society...”

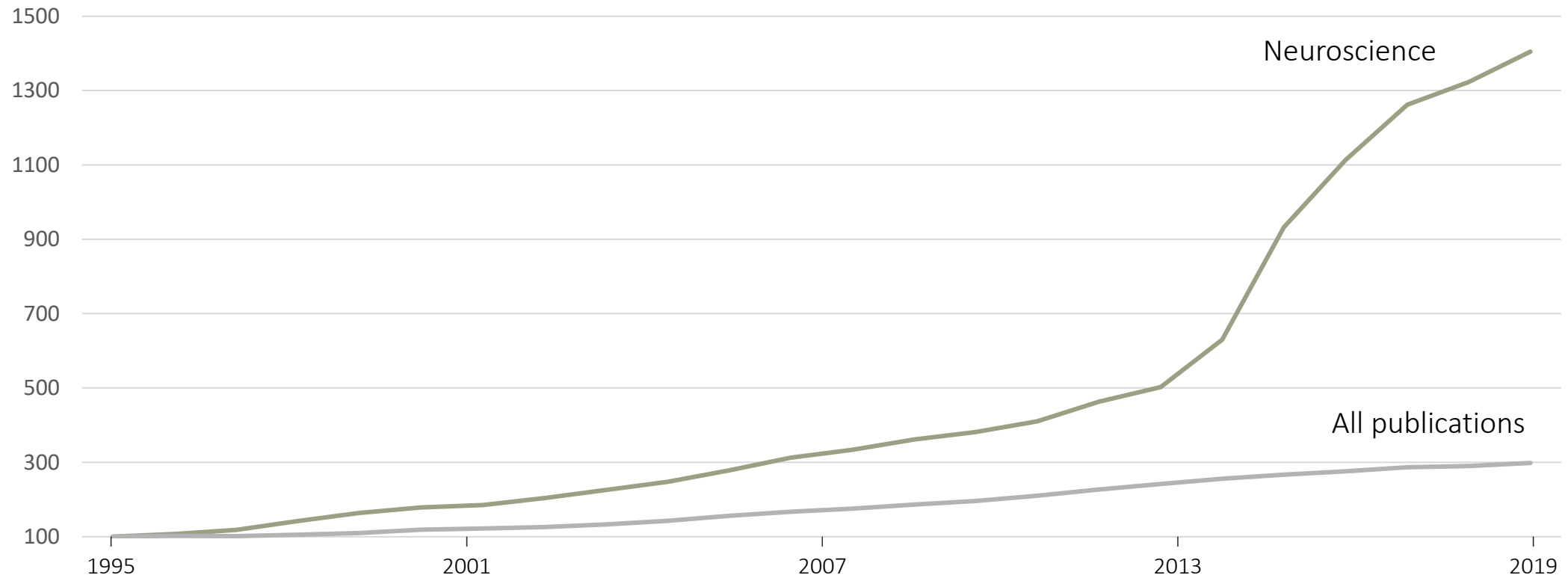




Growth in Neuroscience

Number of scientific publications / year

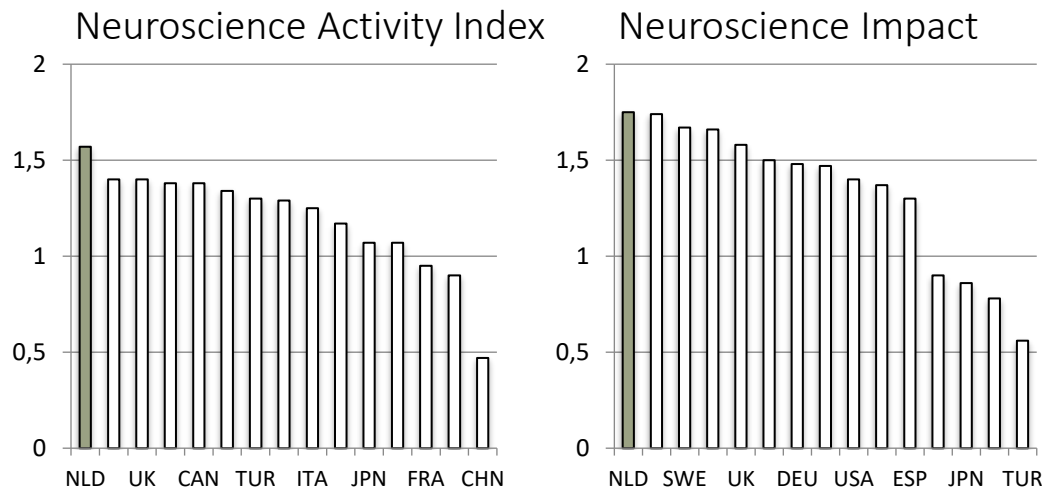
1995 = 100 Source: Pubmed.gov





Hotspot in NL, hotspot in Nijmegen

Right place



Source: Brain Science: Mapping the Landscape of Brain and Neuroscience Research. Elsevier 2014

Right place



- Donders Institute
- Behavioral Science Institute
- Max-Planck-Institute
- ...



The Healthy Brain Initiative

Institute for Health Sciences
Radboudumc

Institute for Molecular Life Sciences
Radboudumc

DONDERS
INSTITUTE



Radboud University Nijmegen

BSI
Behavioural Science Institute

MAX PLANCK INSTITUTE
FOR **PSYCHOLINGUISTICS**

Institute for Computing
and Information Sciences
Radboud University

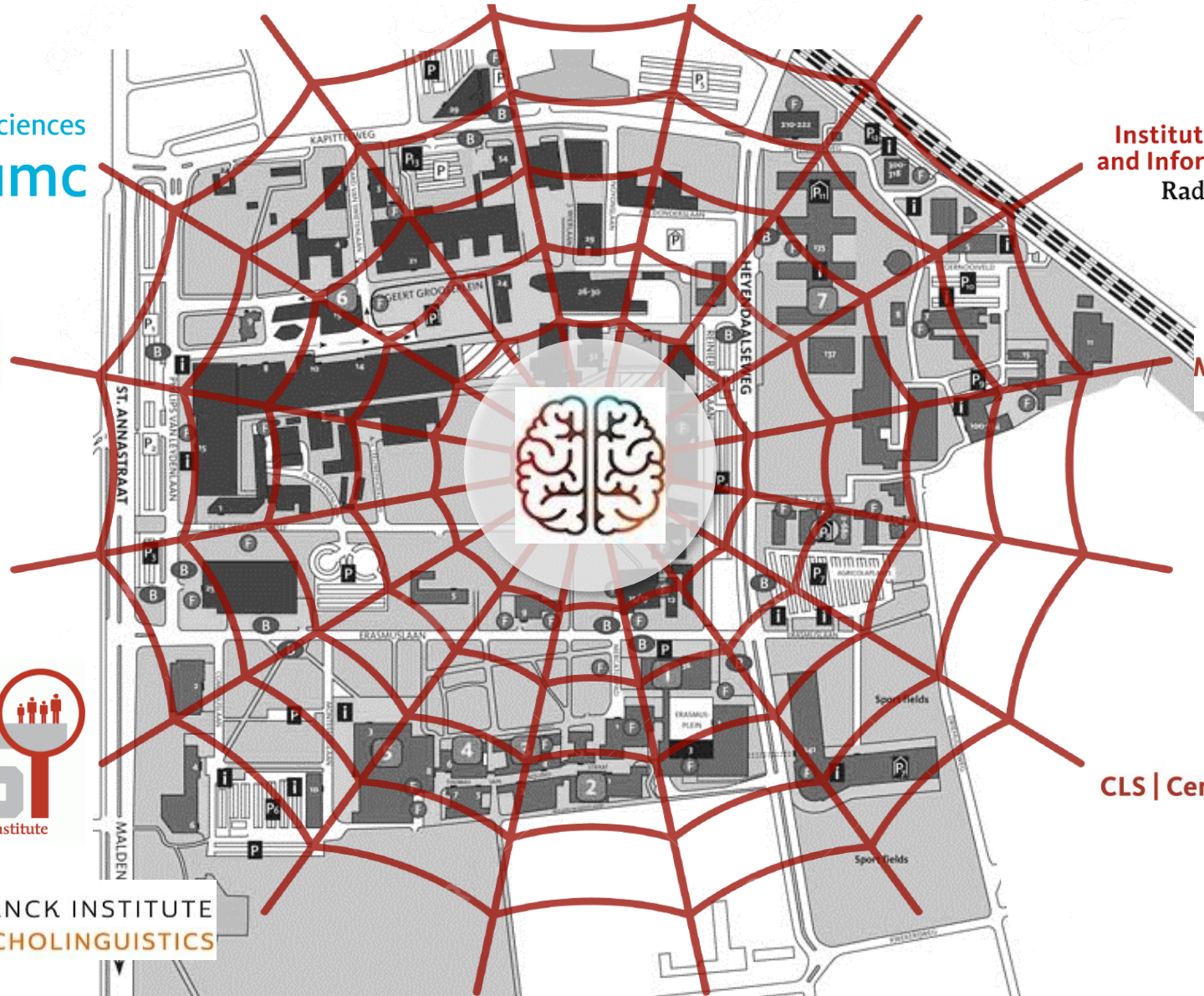


Institute for
Molecules and Materials
Radboud University



Nijmegen
School of
Management

CLS | Centre for Language Studies
Radboud University





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Virtual opening on December 16th
register @ bit.ly/NeurotechEU_VO





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**Healthy
Brain
Study**

Het dertigersbrein
ontrafeld





Healthy Brain Study

Het dertigersbrein
ontrafeld

Complementing small-scale studies

EXPERIMENTAL STUDIES

- Monodisciplinary
- Reductionistic approach
- Group average
- Single-session assessment
- Laboratory experiment
- Students

HEALTHY BRAIN STUDY

- Interdisciplinary
- Multidimensional assessment
- Large n and single-subject validity
- Dynamic Assessment
- Step into the real world
- Population-based sample



Healthy Brain Study

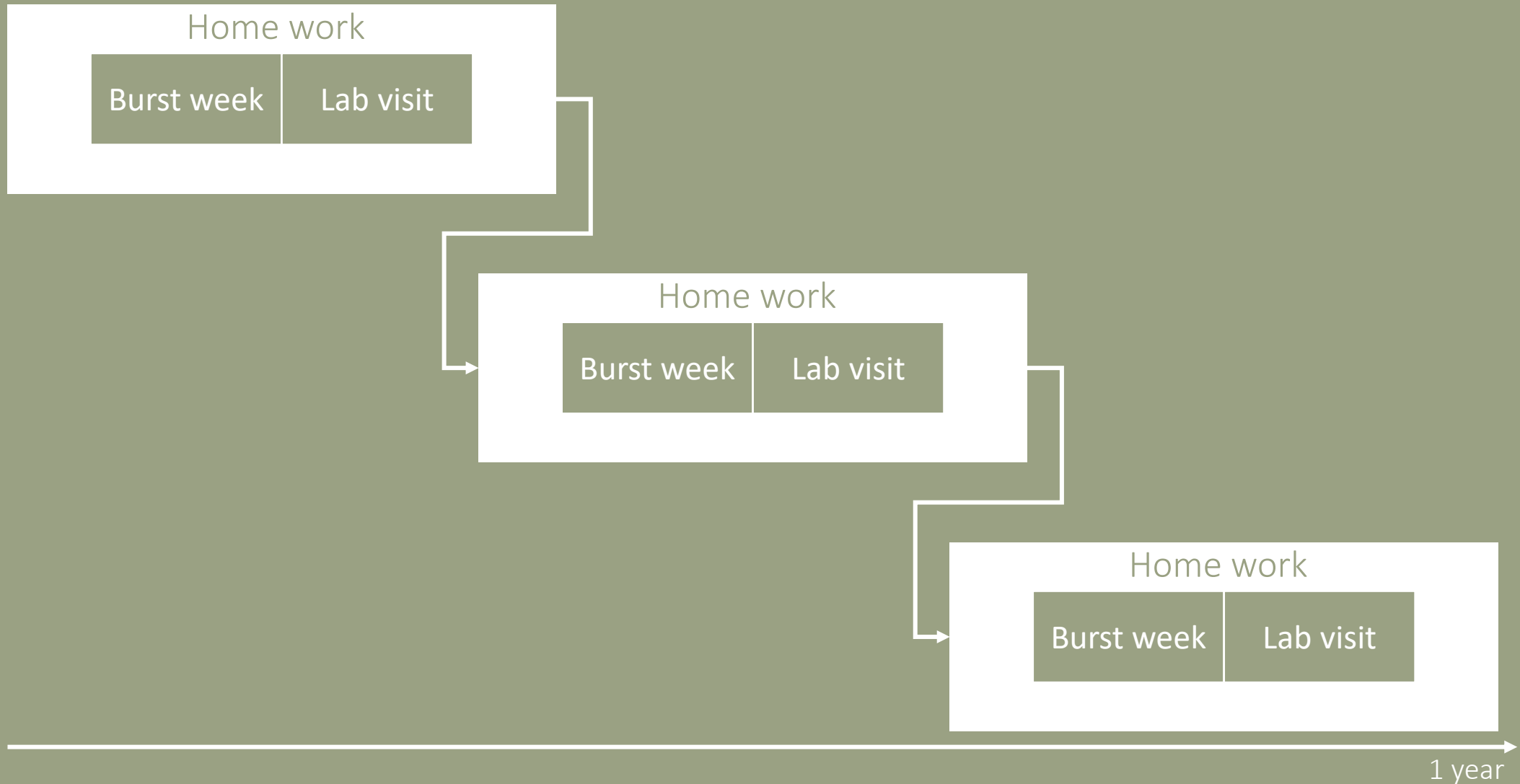
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Participants

- 1000 people aged 30-39 y
- Rather healthy, Dutch speaking
- Representative sample from the greater Nijmegen area
- Monitored and adjusted: Gender, age and education



Overall Design











Healthy Brain Study

Het dertigersbrein ontrafeld

Burst week

Burst week with wearable devices 			
 1 week	Once	 Collecting stool by home sampling stool kit Collecting first morning urine in sterile urine container Collecting saliva by home saliva kit	30 min
	Daily	 Collecting self-report data by using a smartphone-based app	10 x 1,5 minutes
		 Physiological recordings by wearable devices	continuous
		 Sleep recording	during the night

Lab Visit

Lab visit Radboud campus 			
1 Day	Start	 Welcome Biosamples: collecting blood and hair	8.00 - 8.30
		Breakfast	8.30 - 8.45
	MRI	 Mock scanner followed by neuroimaging	8.45 - 9.45
		Break	9.45 - 10.00
	Behaviour	 Behavioural tasks	10.00 - 11.00
		Break	11.00 - 11.15
	Physiology	  Measuring body composition Åstrand-Ryhming test Cold pressor test including saliva collection.	11.15 - 12.15
		Lunch	12.15 - 12.45
	Cognition	 Cognition tasks	12.45 - 14.00
		Break	14.00 - 14.15
	Affect	 Affective tasks	14.15 - 15.30
	Sensory	 Sensory tests	15.30 - 15.45
	End	 Feedback	15.45 - 16.00

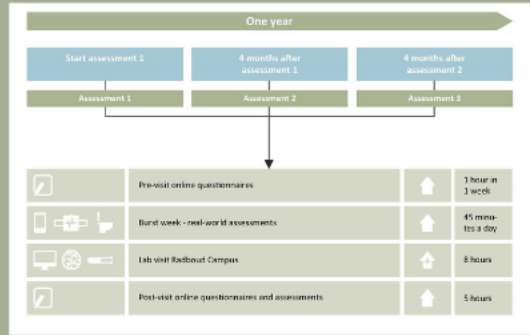


Understanding the human brain



2017

- Network for team science
- Rationale and design:
 - Truly interdisciplinary
 - Large N and single-subject inferences
 - Repeated measures
 - Daily life
 - Population-based



2018

Preparation and implementation of all assessments



July 2019
Start recruitment of 1000 people from Nijmegen region, aged 30-39 yrs old.



March 2020

- Study on hold due to Covid-19
- 136 Informed consent forms signed
- 104 assessments

July 2020

Resume study

August 2020

First rewarded pre-seed subsidies.



September 2019

- First participants included
- Start data collection



2022 and beyond

Many research projects using the Healthy Brain Study data



2022

- Data collected
- 90 Terabyte
- > 500.000 hours of assessments



2021/2022

- Pre seed subsidies
- External grants

November 2020

- 264 Informed consent forms signed
- 261 assessments
- 15 participants finished the complete study





**Healthy
Brain
Study**

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What is in for YOU?

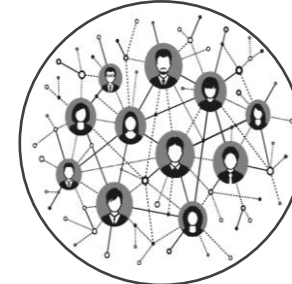
Data



Expertise



Network



Infrastructure





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Healthy Brain Study

Project leader
Guillén Fernández

G.Fernandez@donders.ru.nl

Project manager
Lucy Overbeek

Lucy.Overbeek@radboudumc.nl