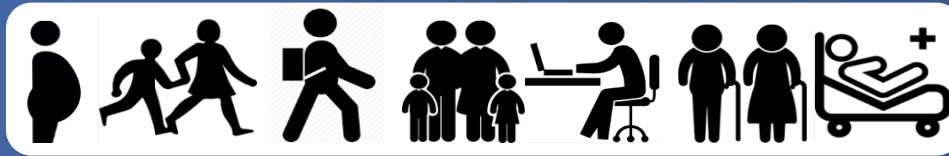


# Healthy Ageing Research Groningen

*From fundamental mechanisms to clinical application*



**Erik Boddeke**

Dean of Research

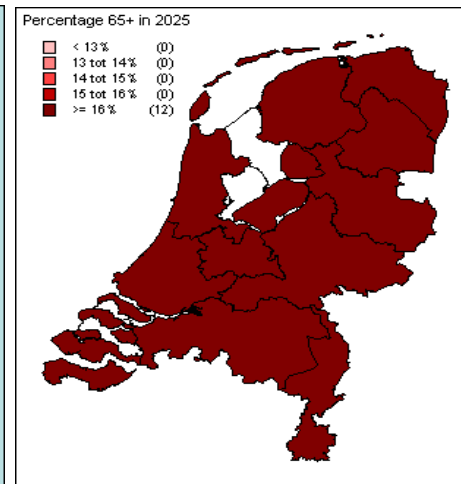
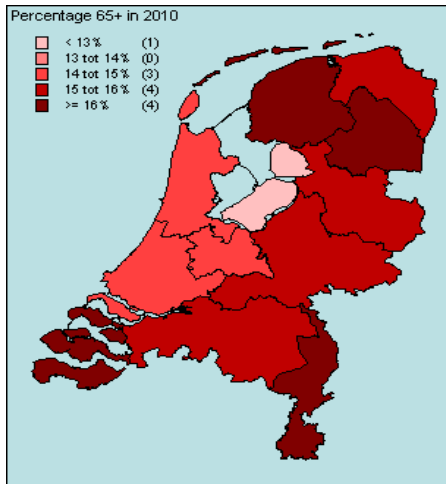
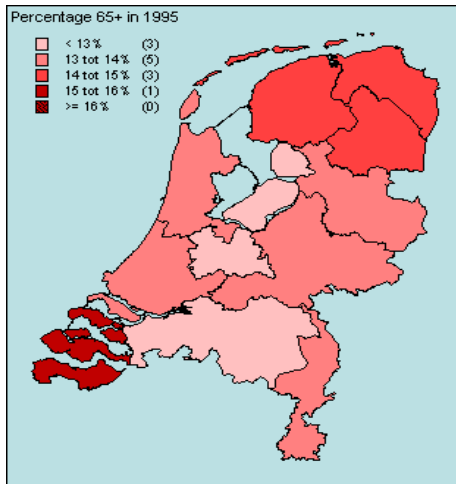
Dept. Neuroscience

University Medical Center Groningen, The  
Netherlands

ER GAAT NIETS BOVEN   
**GRONINGEN**

city  
of  
talent

# Healthy ageing is a challenge



Sterfte aan ziekten van het hart vaatstelsel 2009-2011: per gemeente\*, gecorrigeerd voor leeftijd en geslacht

Index (Nederland = 100)\*

< 90
90 - 95
95 - 105
105 - 110
> 110

— GGD-regio's

Cardiovasculair

\*Comparative Mortality Figure (CMF)

Bron: CBS, Doelmatigheidsmetingen, gegevens bezocht door RIVM

Overgewicht 2012 per gemeente\*, volwassenen van 19 jaar en ouder

Percentage

32,0 - 40,5
40,5 - 44,5
44,5 - 48,5
48,5 - 50,7
50,7 - 62,0

□ geen gegevens

Overweight

\*Een aantal gemeenten zijn samengevoegd

Bron: Doelmatigheidsmetingen GGD'en, CBS en RIVM

Eén of meer chronische ziekten 2012 per gemeente\*, volwassenen van 19 jaar en ouder

Percentage

41,0 - 54,0
54,0 - 60,0
60,0 - 62,2
62,2 - 64,2
64,2 - 72,5

1 or more chronic diseases

\*Een aantal gemeenten zijn samengevoegd

Bron: Doelmatigheidsmetingen GGD'en, CBS en RIVM

Diabetes 2011 per gemeente

Aantal patiënten per 1.000 inwoners

25 - 40
40 - 45
45 - 50
50 - 75

— provincies

Diabetes

Bron: RIVM, SBAC, IMA

# There are regions in the world where they do better



# Our Ambition is a Man Made Blue Zone



Healthy Ageing Network  
Northern Netherlands  
Region of Knowledge and Development

We share this ambition with our regional partners in the Healthy Ageing Network Northern Netherlands

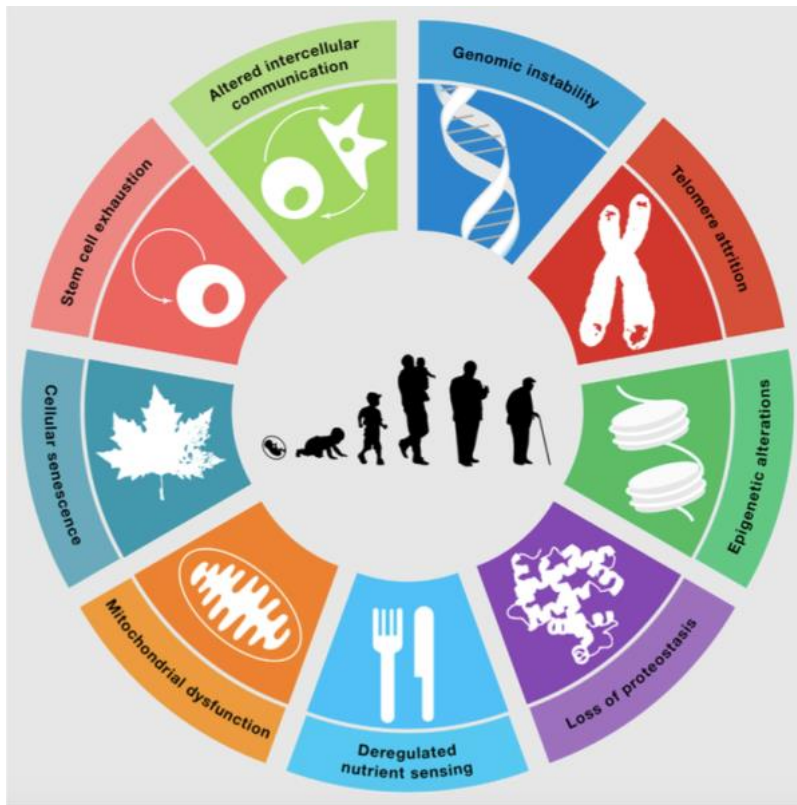
Health literacy  
Food consumption  
Physical activity and living conditions  
Monitoring: LifeLines



EIP on AHA  
REFERENCE SITE  
★★★★



# healthy ageing translational research



**ERIBA**

**lifelines** 

# European Research Institute for the Biology of Ageing

- 13 research groups
- 150 researchers
- 4500 sq mtrs
- Opening November 2013
- Total investment 50 M€

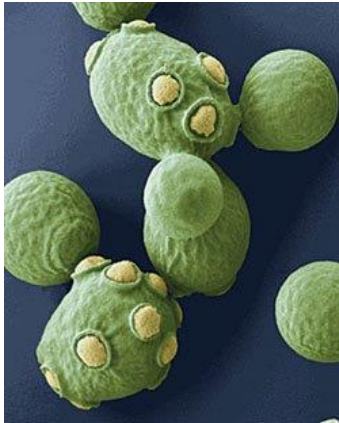
The mission of ERIBA is to better understand what causes ageing.

# ERIBA

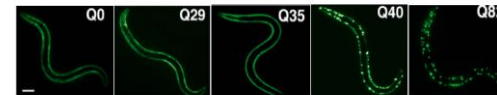
**Skoltech**  
Skolkovo Institute of Science and Technology



# Translational Research

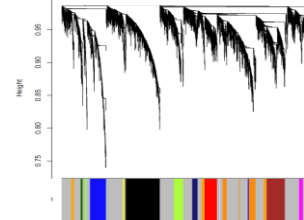


Protein aggregation in *C. elegans*

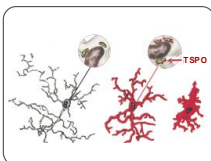
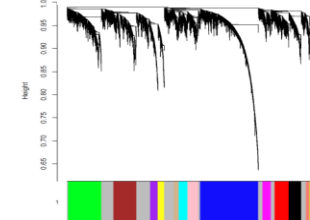


## Ageing models

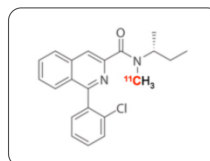
### Physiological



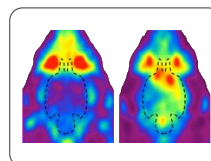
### DNA-damage



Microglia  
activation & T SPO  
overexpression

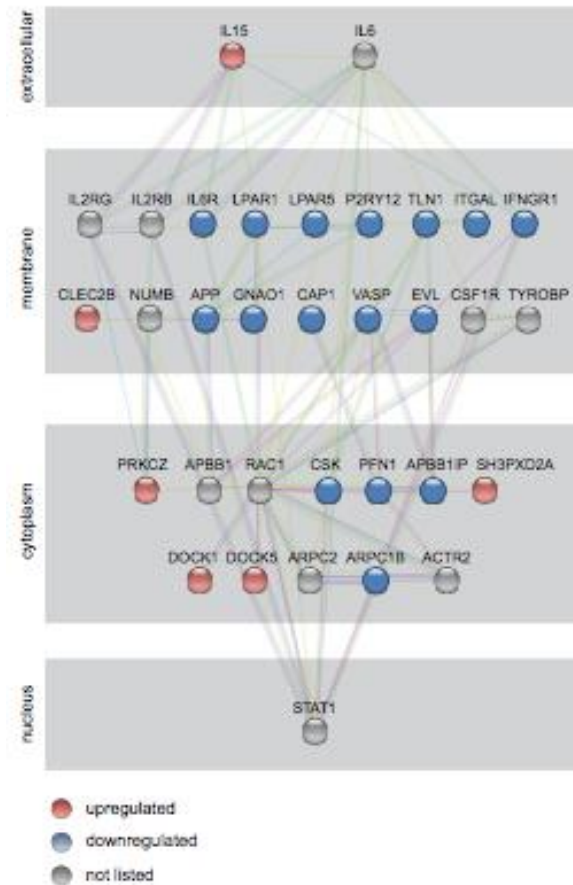
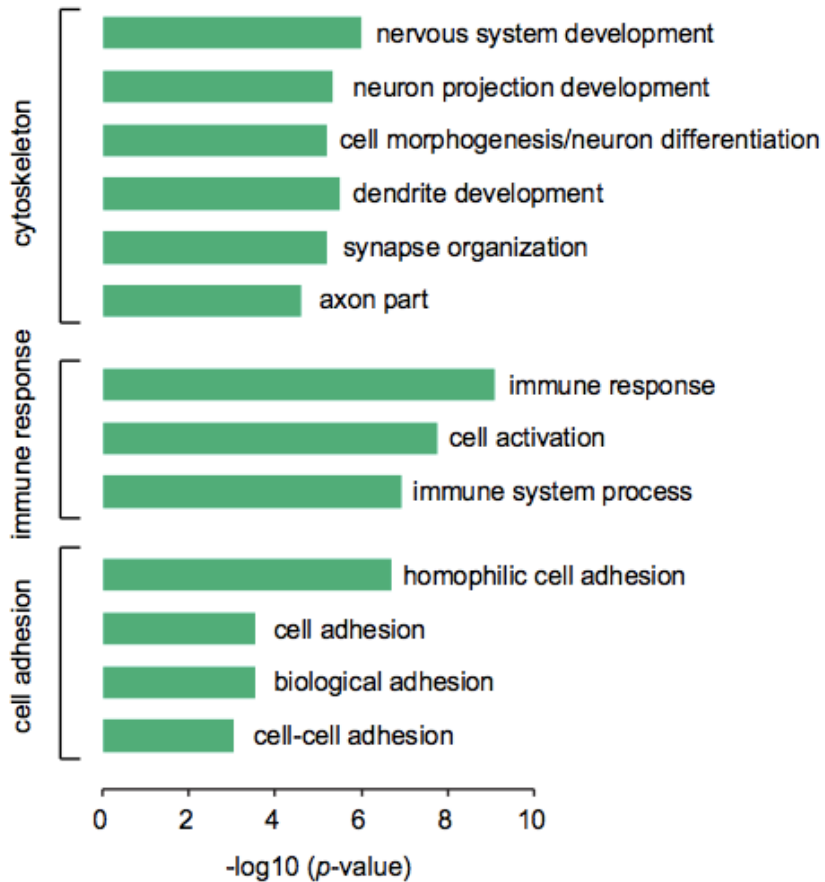


Radiolabelled  
T SPO ligand,  
[<sup>11</sup>C]PK11195



In vivo PET  
imaging

# human brain macrophage transcriptome: age



Collaboration: Prof. S.K.N. Marie, *Department of Neurology, Laboratory of Molecular and Cellular Biology, LIM15, School of Medicine, University of São Paulo & Center for Studies of Cellular and Molecular Therapy*





**lifelines**

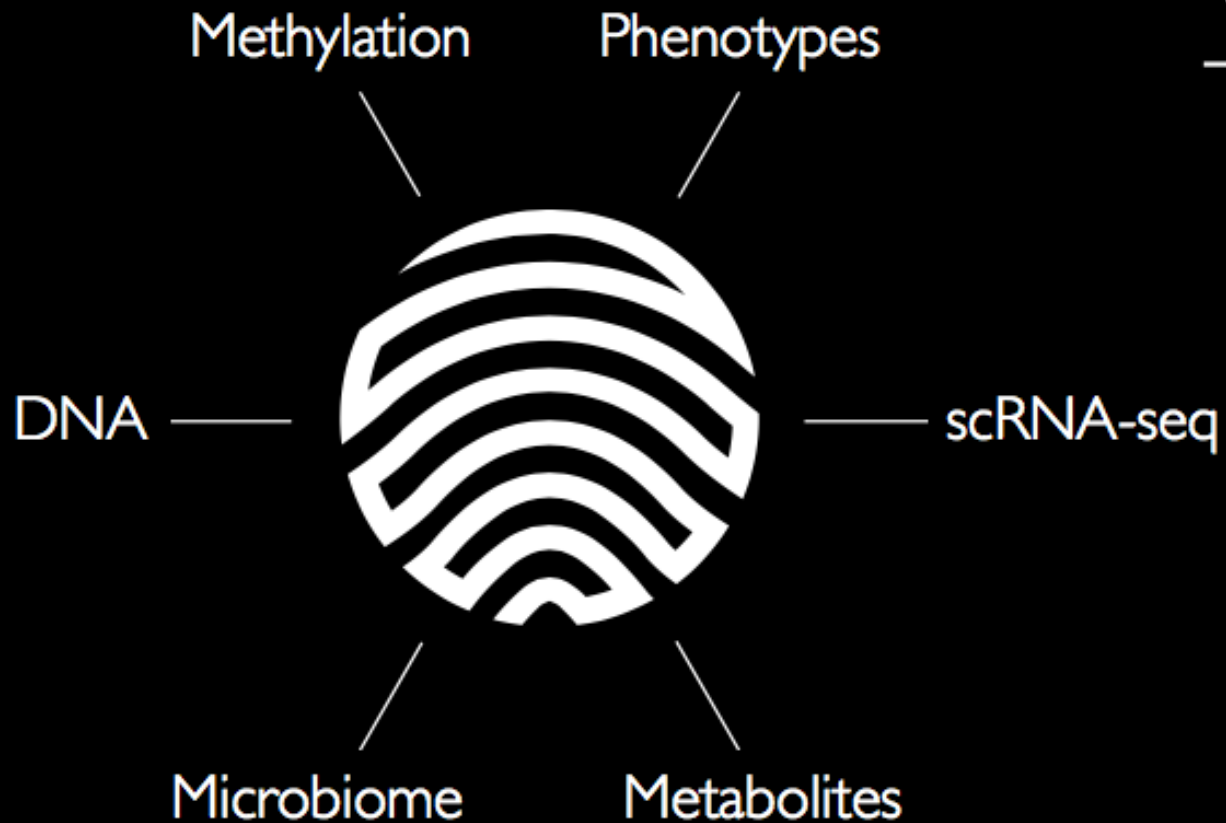
## Population research

- Northern Netherlands
- 167.729 participants
- Follow-up for at least 30 years
- 3 generations
- LifeStore

# LifeLines

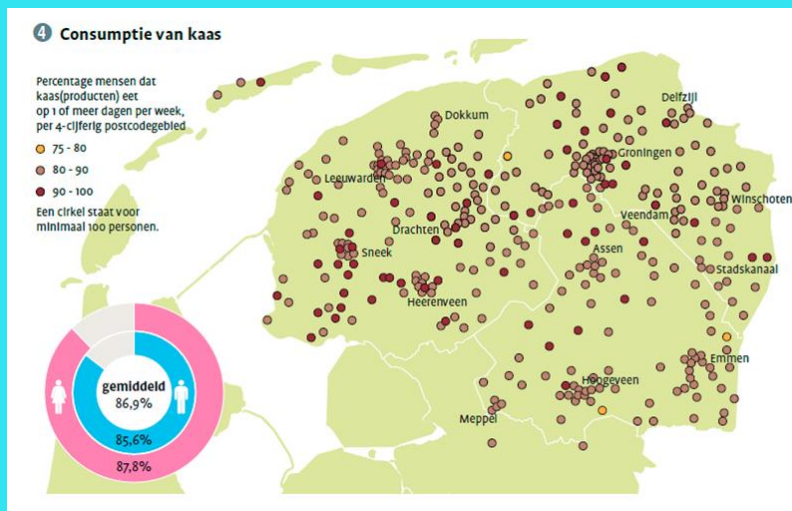


- Collection data and biomaterial
- >165.000 participants
- 30 years follow-up
- 3 generation design
- General population
  
- Research infrastructure
- Worldwide available

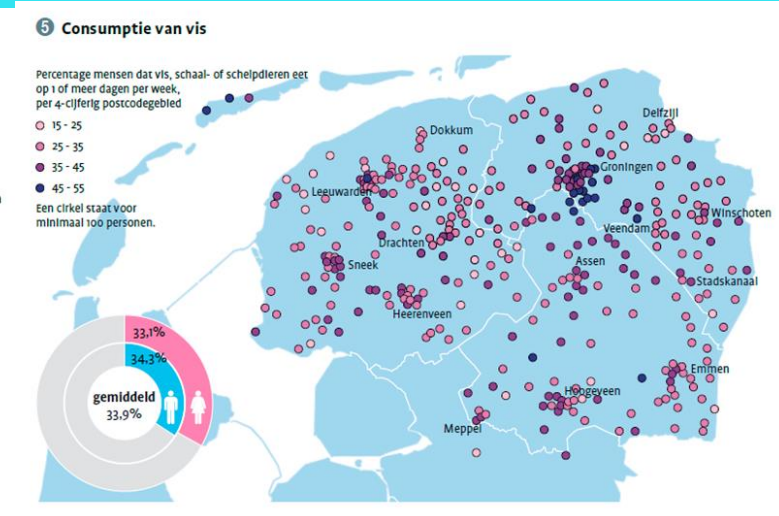


**Lifelines Deep** (1500 samples)

# Lifelines: detailed life style monitoring



Consumption of cheese



Consumption of fish

## Lifelines food consumption data: 3-generations

[www.lifelines.net](http://www.lifelines.net)







— Illumina Global Screening  
Array (€40 per individu)

**End 2017:**

- Genotype data available for  
80.0000 lifelines participants



# Big Data in Health @ Groningen

- Lifelines
  - Largest Dutch population based study
- Target/ERCET
  - Big Data computing infrastructure
- Leading role in national and European biobanking collaborations
  - BioSHaRE
  - BBMRI
  - Maelstrom



# Healthy ageing in the clinic:

UMCG Lifestyle navigator: lifestyle check; advice/ advisors

Embrace: integrated care model for older adults

Peri-surgery fitness

Biomarkers for age-related diseases

Centres for Parkinson-, AD patients

Etc.. Etc..



Healthy Ageing Network

Northern Netherlands  
Region of Knowledge and Development

MADE POSSIBLE BY



European Innovation  
Partnership on Active  
and Healthy Ageing

REFERENCE SITE