# Herinneringen
## (Memories)

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Vlaanderen-Nederland
Europees Fonds voor Regionale Ontwikkeling

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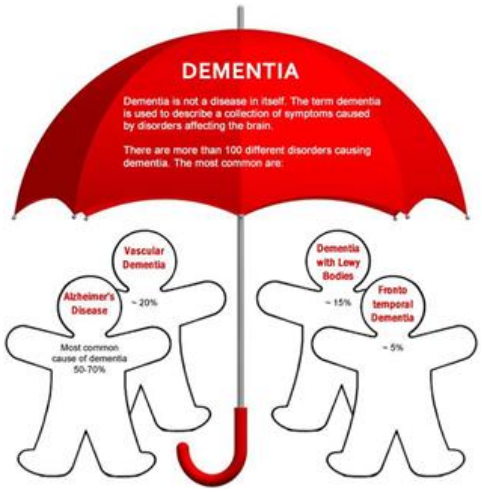


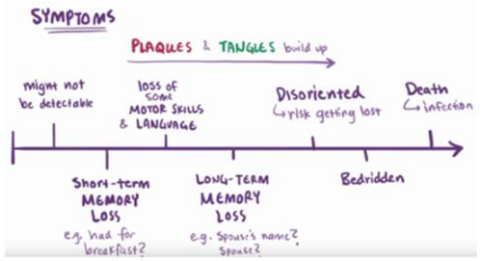


# Overall objective

- Alzheimer's disease (AD) is a set of symptoms caused by disorders affecting the brain
  - e.g. poor memory, difficulty learning, loss of motor skills, …
- Preventing AD is about <u>preventing these symptoms</u> through early diagnosis and treatment.

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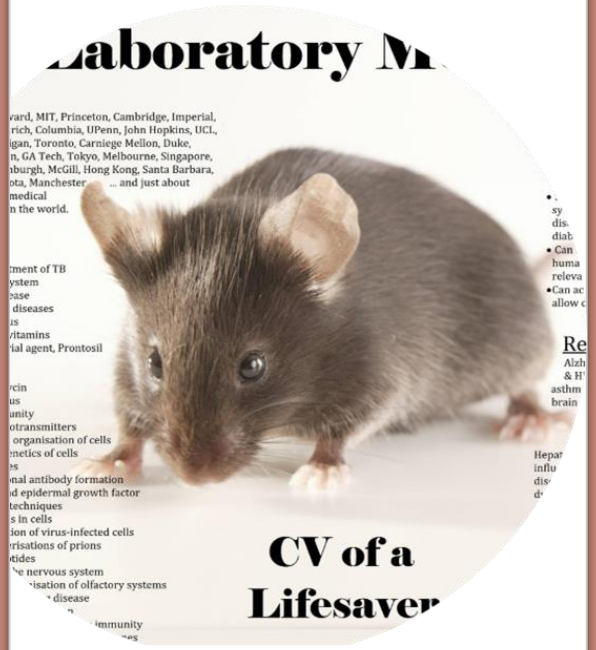


*'Memories''* challenges traditional Alzheimer's research.

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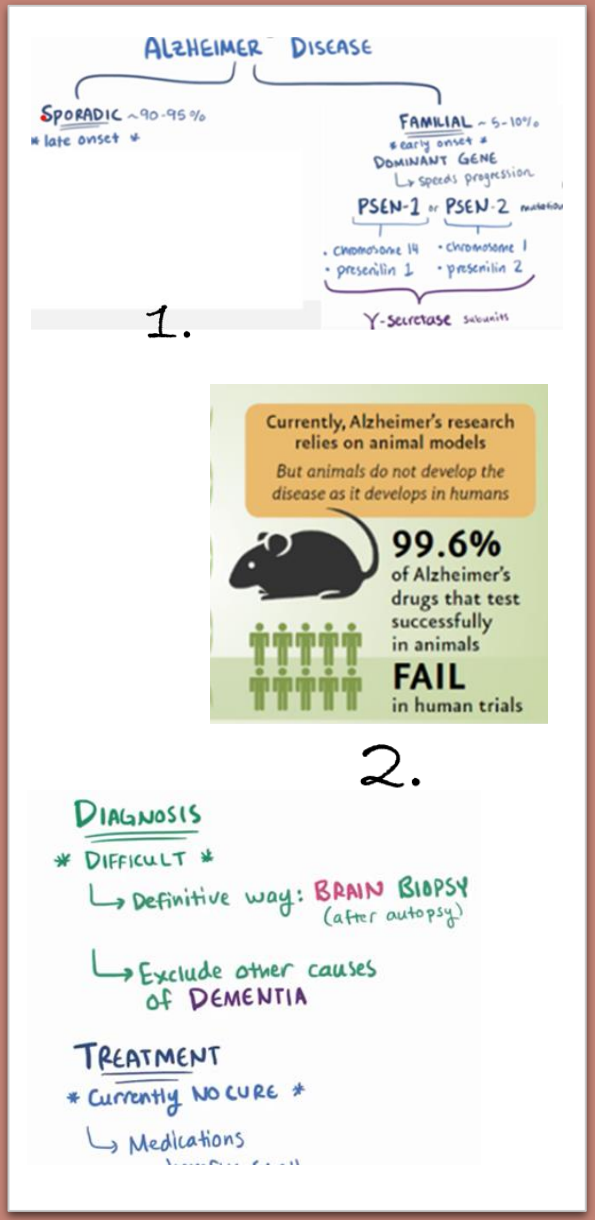
# *''Memories''* challenges the human relevance of traditional Alzheimer's research




- 1. Transgenic animals express typical AD traits without developing the clinical pathology of human AD.
  - 'Familial AD'-like models (<10% of AD cases);
  - Not modelling 'sporadic' AD which is most common (>90% of AD cases).

- 2. Decades of animal research have not translated into therapeutic success:
  - 99.6% failure rate.

- This disconnection between animal model and the human condition is not taken into account sufficiently.

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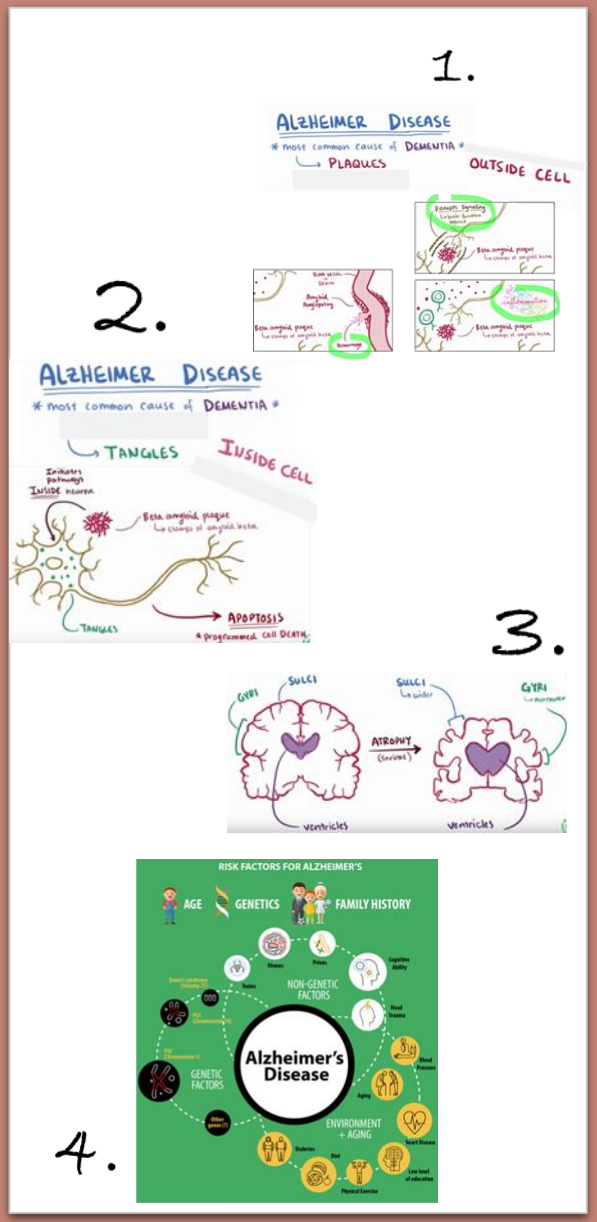
# ''*Memories*'' challenges the focus of traditional Alzheimer's research




- 1.-3. Traditional research has focused on patients with familial AD:
  - Amyloid plaques (1.)+ neurofibrillar tangels (2.);
    - Plaques or tangles not necessarily the cause of AD;
    - Thus targeting these may not be very effective treatment.
  - Brain irreversibly damaged (3.).

- 4. Disproportionately little interest in environmental risk factors for onset and progression of sporadic AD.

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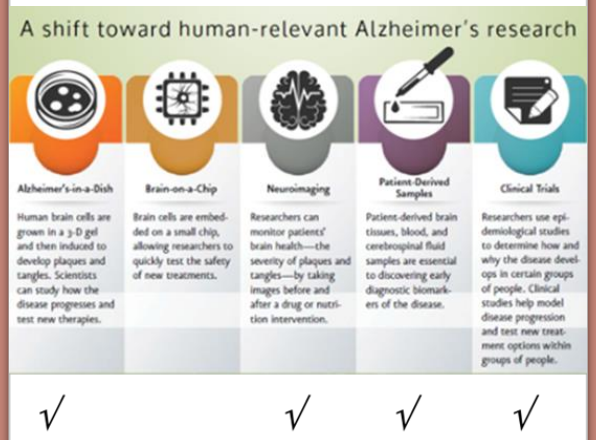
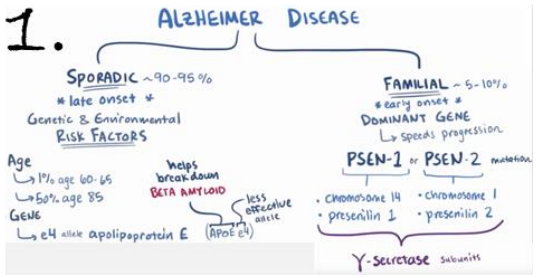
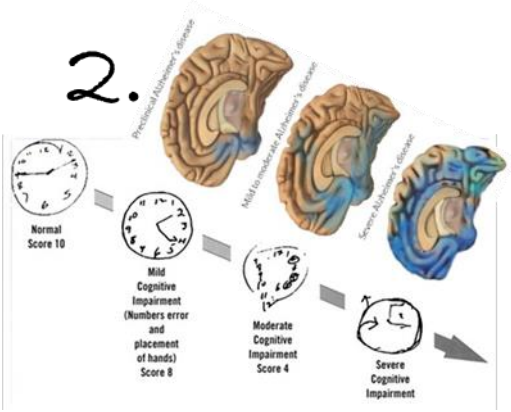


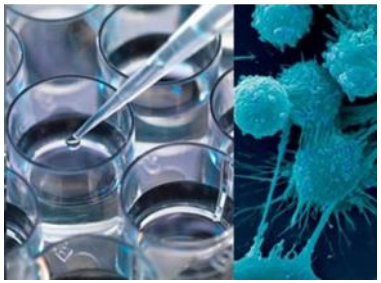

# ''Memories'' new paradigm:

From early <u>changes in gene expression by human neuronal cells in a dish</u> to early diagnosis and new drug targets.

# ''*Memories*'' addresses the earliest stages of human sporadic AD.




- 1. Sporadic AD (>90% of AD cases) is driven by age (changes in genes?) and exposure to <u>external risk factors:</u>
  - Lifestyle,
  - Drugs,
  - Chemicals.
- 2. Clinically, familial and <u>sporadic AD</u> are similar.
- 3. Traditional approaches for toxicity assessment can be applied to <u>identify preclinical changes.</u>

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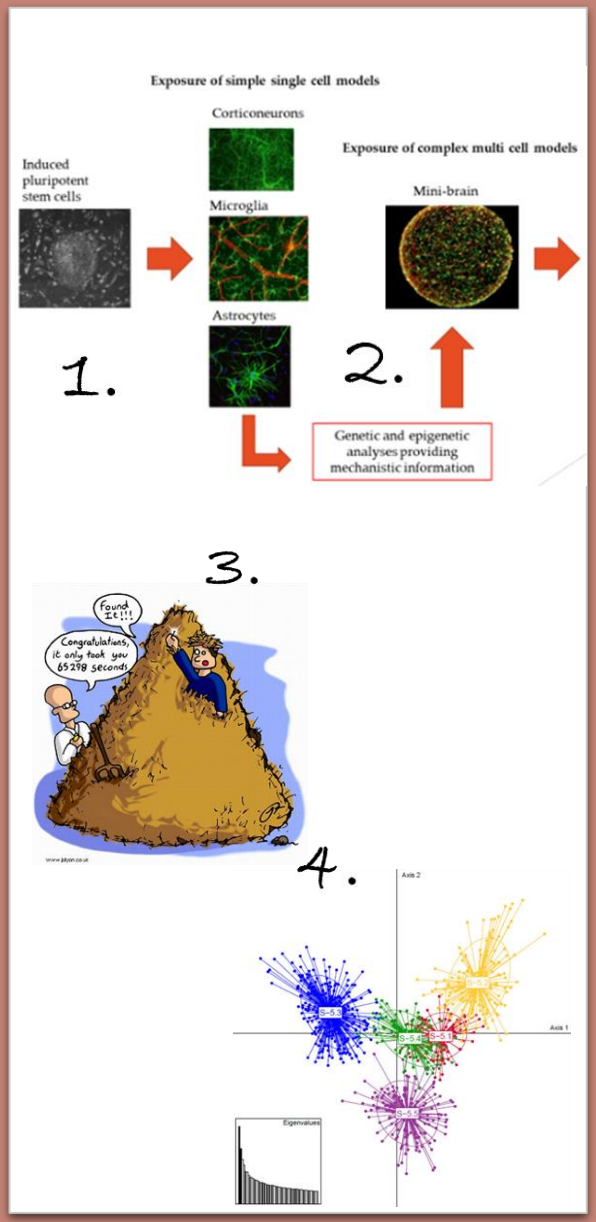
# ''*Memories*'' does not use animal models for gene identification.




- 1. Exploitation of the advances in induced pluripotent stem cell (iPSC) technology.
- 2. iPSC derived human cortico-neurons are exposed to external risk factors while in culture.
  - Pesticides,
  - Drugs,
  - Heavy metals.
- 3.-4. Identification of differences in gene expression and processes.

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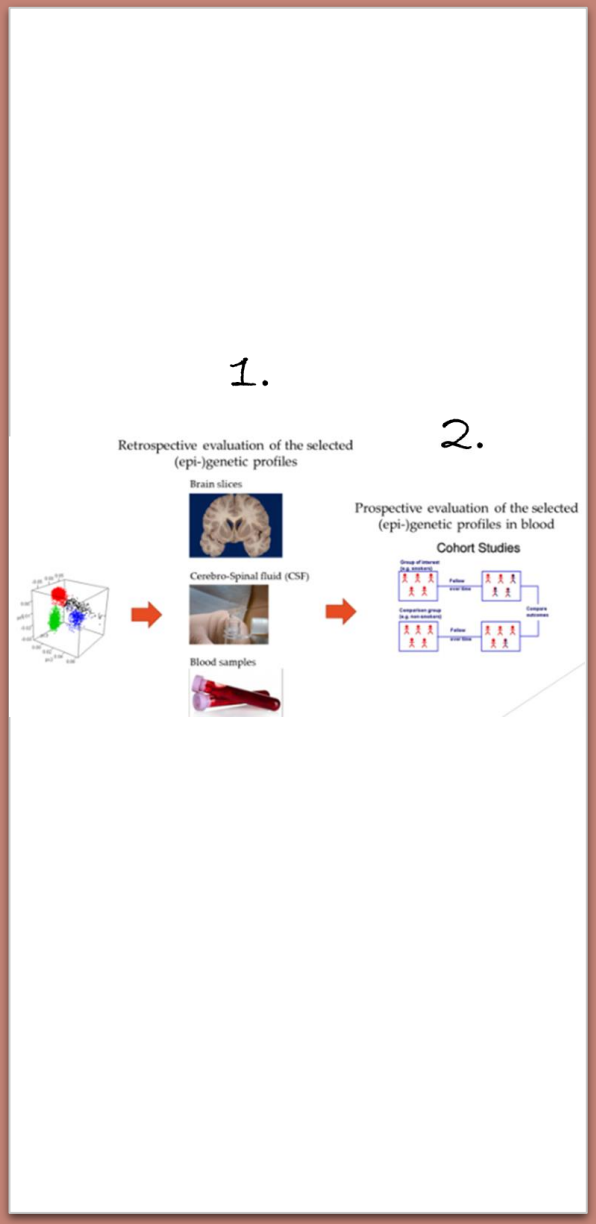
# ''Memories'' does not use animal models to demonstrate human relevance.




- 1. Evaluation (retrospective) of the human relevance of potential (soluble) biomarkers on human clinical samples:
  - Brain slices;
  - Cerebrospinal fluid;
  - Blood*.

- 2. Evaluation (prospective) of the predictivity of confirmed biomarker 'blood' profile in human cohorts.

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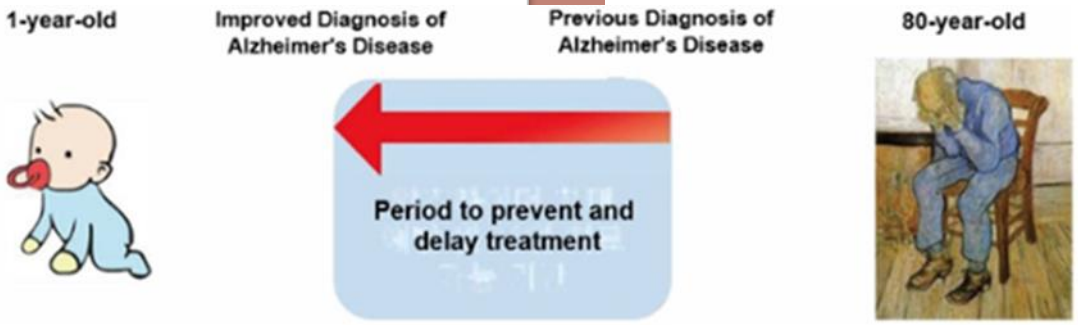
''*Memories*'' aims at tools that support prevention of clinical AD.

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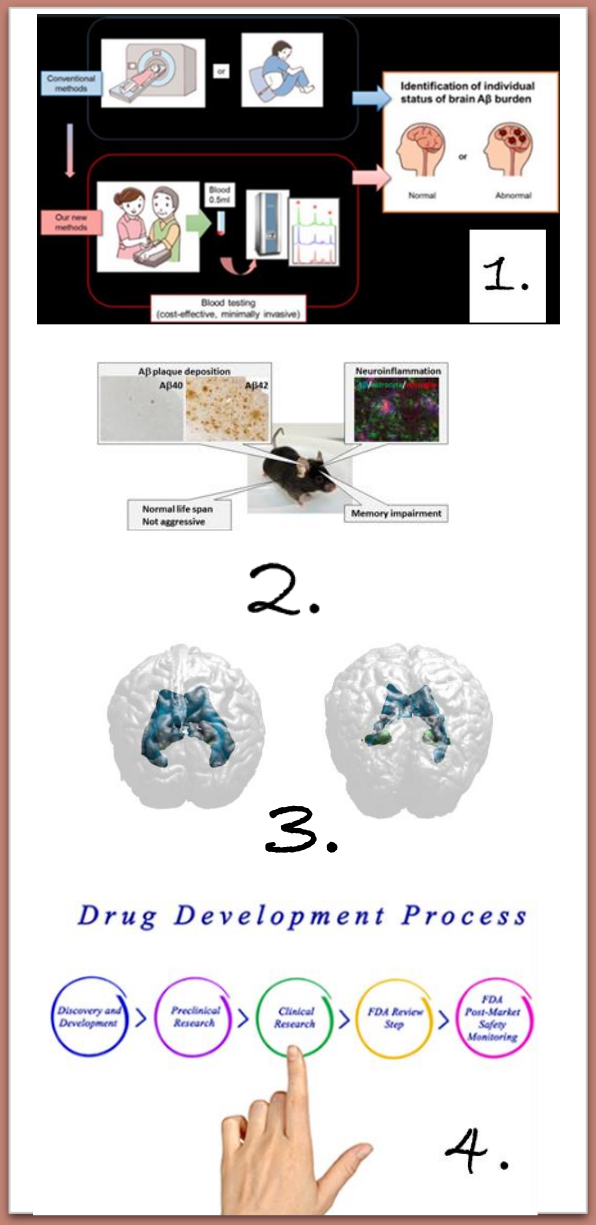


# *''Memories''* aims at early diagnosis and treatment.

- 1. Cost-effective, minimally invasive blood test:
  - Early diagnosis;
  - Follow-up on disease development;
  - Follow-up on treatment efficacy.
- 2. Improved animal models for AD:
  - Validation of current animal models for AD.
- 3. Improved Magnetic Resonance Imaging (MRI).
- 4. Novel drug targets for drug development.

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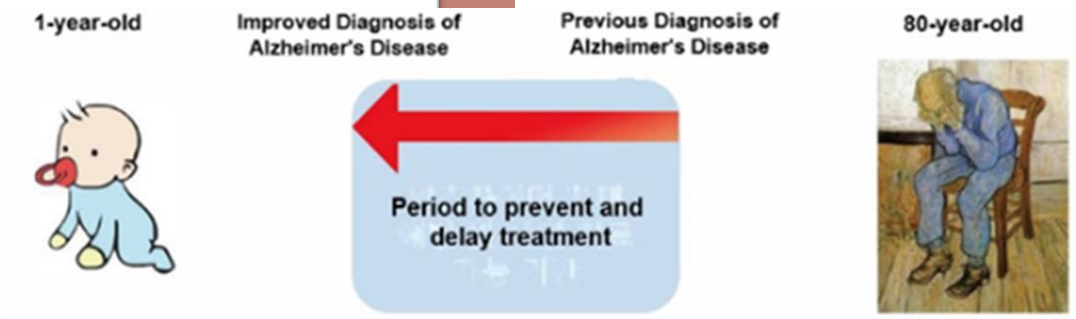
# Anticipated outcome of ''Memories''

- Improved tools for early diagnosis of AD development and drug discovery
- New drugs for early treatment resulting in delay, eventually prevention, of clinical AD.
- Better quality of life for patients and family.
- Lower costs.



# Co-financing

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Ministerie van Economische Zaken

AGENTSCHAP INNOVEREN & ONDERNEMEN
Vlaanderen is ondernemen

provincie limburg

Provincie Antwerpen

VLAAMS-BRABANT

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