

Despite some progress, Alzheimer's fight falling flat

September 20 2018, by Etienne Balmer



Friday September 21 is World Alzheimer's Day, an event launched in 2012 to raise global awareness of the disease

It's a devastating disease driving a dementia epidemic ruining tens of millions of lives, but with no new medical treatment since the turn of the

century the fight against Alzheimer's is foundering.

Despite decades of research and hundreds of millions of dollars, the precise cause of the neurodegenerative disease—which leaves victims suffering from memory loss, disorientation and behavioural problems—remains poorly understood.

"It's a bit like solving a jigsaw puzzle without knowing what the end result needs to look like," said Pierre Tariot, director of the Banner Alzheimer's Institute in Phoenix, Arizona.

This year alone, pharmaceutical giants—including Lundbeck, Takeda, Merck & Co, Janssen Biotech, AstraZeneca and Eli Lilly—have either halted or failed in their search for a new Alzheimer's drug.

US drug giant Pfizer said in January it was abandoning all research into the disease.

The problem, according to Marie Sarazin, director of neurology at the Saint-Anne hospital in Paris, is that scientific research has followed "the same track" for decades.

After trials on mice focused on diseased neurons in the brain appeared to produce a breakthrough in the early 2000s, many corporations "thought they'd hit the jackpot", Sarazin said.

But follow up research has so far failed to produce a new medical treatment for Alzheimer's. Indeed, the long-held hypothesis over what causes the disease in the first place is now being reconsidered.

Alzheimer's disease Accounts for 2 thirds of dementia cases

Healthy brain

Comprised of approx. 100 billion brain cells (**neurons**)

Neurons connect to each other at synapses where **neurotransmitters** pass signals between cells

The transfer of electrical and chemical impulses form our **memories, thoughts and feelings**

Alzheimer's brain

The disease disrupts electrical signals and the activity of **neurotransmitters**

▶ **Cortex** shrivels

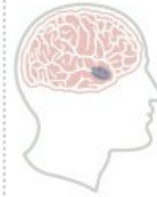
▶ Increase in **fluid-filled spaces**

▶ Beta-amyloids form abnormal **plaques**

▶ Twisted strands of protein (**tangles**) appear

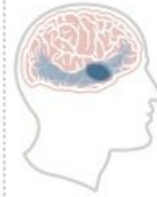
▶ The exact **role of plaques and tangles** in the disease is still a matter of study

How the disease evolves



EARLY

Mild effects on **learning and memory**, possibly beginning 20 years before diagnosis



MIDDLE

Moderate impairment of **memory, thinking and planning**, lasting 2-10 years



LATE

Severe impairment of **speaking and understanding**. Patient may **not recognise family and friends**. Can last 1-5 years

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Source: World Alzheimer Report/Alz.org/news.sciencemag.org

How Alzheimer's disease develops

Astronomical cost

Alzheimer's occurs when neurons in the brain lose their ability to communicate with one another, leading patients to struggle to remember names and places, orientate themselves or interact with loved ones.

Worldwide, about seven percent of people over 65 suffer from the disease or some form of dementia, a percentage that rises to 40 percent above the age of 85.

The number afflicted is expected to triple by 2050 to 152 million, according to the World Health Organization, posing a huge challenge to healthcare systems.

Alzheimer's cost an estimated \$818 billion (700 billion euros) in 2015—equivalent to around one percent of global GDP, and this is predicted to double by 2030.

Friday is World Alzheimer's Day, an event launched in 2012 to raise global awareness of the disease.

It comes this year with a glimmer of promise for a breakthrough: a joint US-Japanese clinical trial of an antibody designed to breakdown proteins thought to hamper neuroactivity significantly helped the brain function of test subjects.

On Wednesday, a team of scientists in the US said they had eliminated dead-but-toxic cells occurring naturally in the brains of mice designed to mimic Alzheimer's and slowed neuron damage and memory loss associated with the disease.

But with developed nations dealing with the health challenges posed by ageing populations, many experts agree that more attention must focus on prevention as well as cure.

Exercise, drinking less alcohol and eating a balanced diet have all shown to reduce the risk of developing Alzheimer's.

"It seems that like in any other neurodegenerative disease, the key will be to go into prevention, as early as possible before signs and symptoms of the pathology occurs," Danny Bar-Zohar, global head of neuroscience development at Novartis, told AFP.

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