

Down syndrome and Alzheimer's disease



It is estimated that the lifetime risk of Alzheimer's disease (AD) is greater than 90%, and it is the leading cause of death for adults with Down syndrome.

Why is there a higher risk of Alzheimer's disease for people with Down syndrome?

Human chromosomes usually occur in pairs. Neuro-typical individuals are born with 23 pairs of chromosomes, while people with Down syndrome are born with three copies of Chromosome 21. The Amyloid Precursor Protein gene (APP) that produces amyloid protein is located on Chromosome 21.

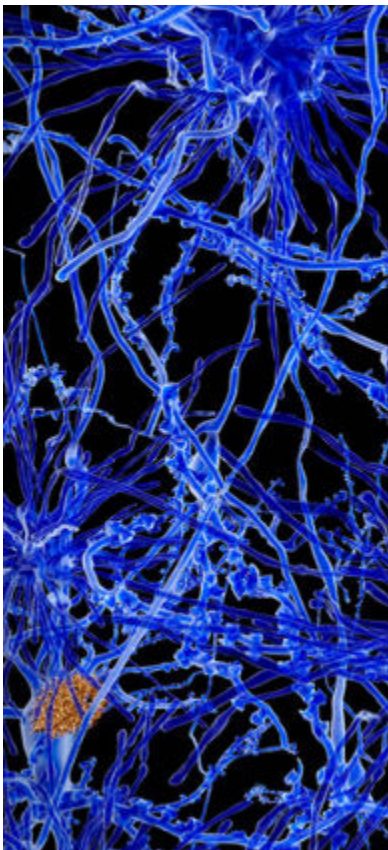
In Alzheimer's disease, the amyloid protein is cleaved by enzymes into smaller pieces called peptides, the peptides clump together to form amyloid beta plaques that are toxic to brain neurons. These plaques materialize 10 to 20 years before the first symptoms of Alzheimer's disease start to appear.

Since people with Down syndrome have an extra dose of the APP gene, they have an extra amount of amyloid protein. That is why scientists believe that people with Down syndrome get Alzheimer's disease at such a high rate and at a younger age than the general population.

By age 40, the brains of almost all individuals with Down syndrome have significant levels of amyloid plaques, one of the hallmarks of AD.

Another process associated with Alzheimer's disease are the formation of tangles inside the neurons. The tangles are comprised of a protein known as "tau" which loses its normal function in brain cells forming toxic tangles.

The appearance of tau tangles in Alzheimer's disease is closely associated with the appearance of symptoms of memory loss and other forms of cognitive decline.



DS-AD: Steps From Knowledge to Action

What are some of the symptoms of Alzheimer's disease?

Some of the symptoms to be aware of in individuals ages 35 and older are: loss of interest in activities, short-term memory loss, withdrawal, depression, loss of sociability, increase in wandering, trouble learning new things or performing tasks that they used to do before such as: making their bed, preparing their own food, or even brushing their teeth.

What can I do to help my loved one with Down syndrome prevent/prepare/cope with AD?

There are some things you can do now, regardless of the age of your loved one. We recommend:

- Finding a healthcare professional with expertise in Down syndrome.
- If you are questioning a behavior or the loss of a skill, start tracking that behavior and bring your concerns to your loved one's doctor
- Read and learn more about DS-AD (myDSC.org is one free resource available to all)
- Researchers are still learning about lifestyle changes that can lower the risk of developing Alzheimer's disease. These include diet and exercise to maintain a healthy weight, social engagement, education, and treating other health problems such as obstructive sleep apnea.
- Overall healthy lifestyles lead to a healthy brain and lowers the risk of Alzheimer's disease later in life.

We recommend tracking and taking note of changes in behavior, and making an appointment to see your loved one's physician for a discussion.



Alzheimer's Disease is an urgent medical concern for the Down syndrome community. LuMind IDSC responds to this urgency by working with the DS community, scientific researchers, and industry to develop evidence-based therapies and treatments aimed at combatting the onset of Down syndrome-Alzheimer's disease (DS-AD). Learn more at: LumindIDSC.org.