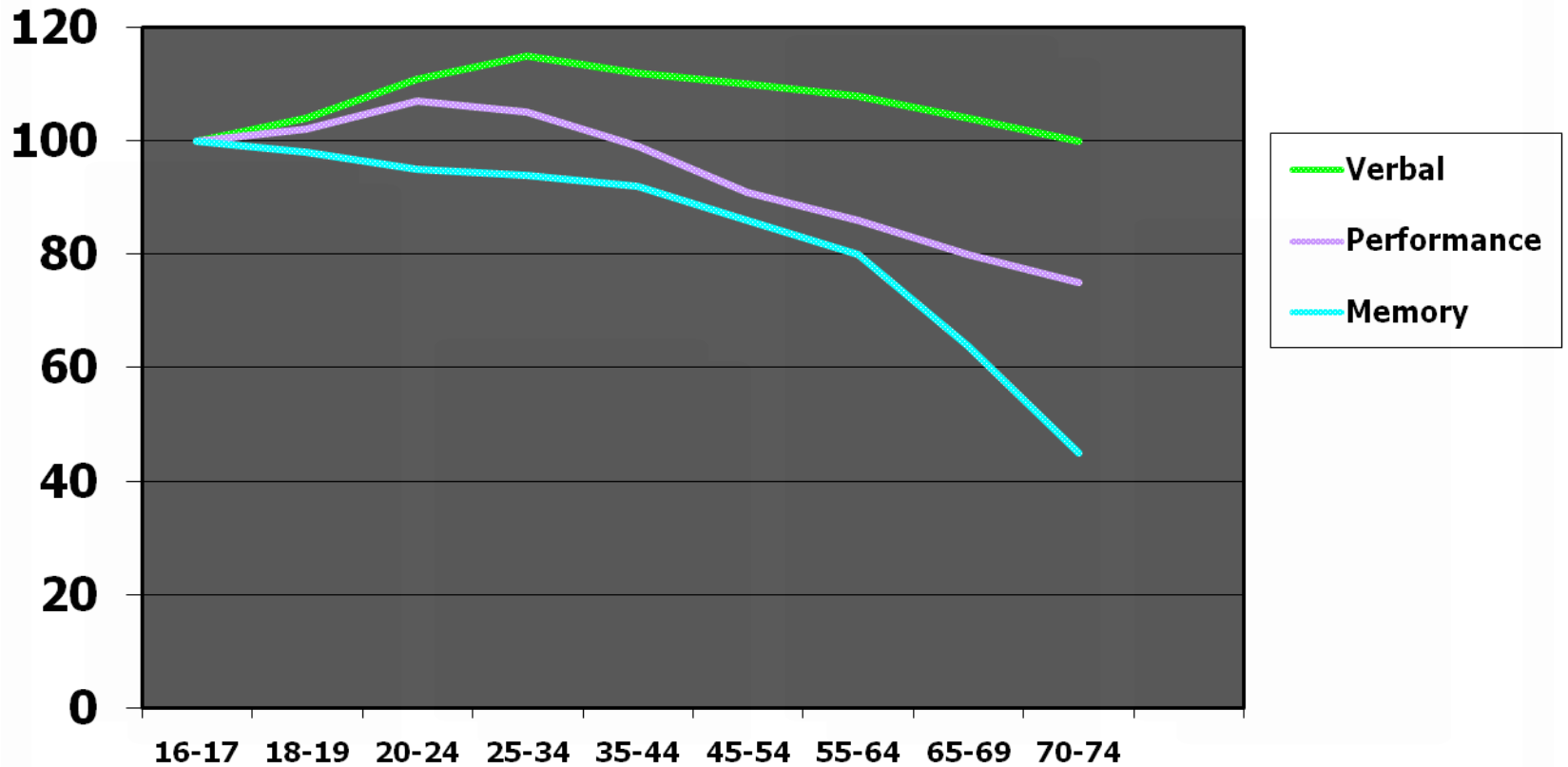
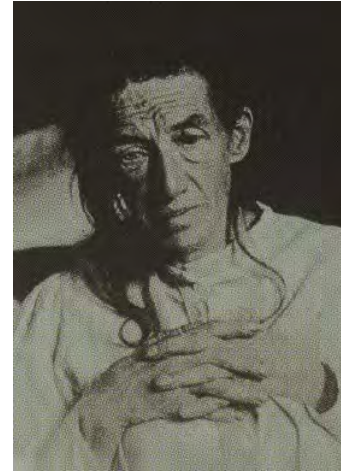


# The Curves of "Normal" Aging



# Alzheimer's Disease (AD)

- Alzheimer's disease is an irreversible, progressive brain disorder that slowly destroys memory and thinking skills, and eventually the ability to carry out the simplest tasks.
- The most common cause of dementia among older adults.  
**Dementia** is the loss of cognitive functioning—thinking, remembering, and reasoning—and behavioral abilities to such an extent that it interferes with a person's daily life and activities.
- 6<sup>th</sup> leading cause of death in the US, just behind heart disease and cancer.
- One in nine people age 65 and older (11%) has AD.



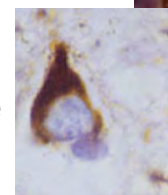
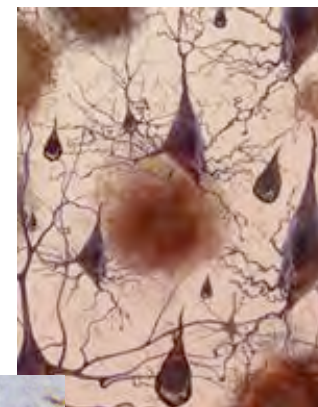
In 1906, Dr. Alzheimer noticed changes in the brain tissue of a woman who had died of an unusual mental illness. Her symptoms included memory loss, language problems, and unpredictable behavior. After she died, he examined her brain and found many abnormal clumps (now called amyloid plaques) and tangled bundles of fibers (now called neurofibrillary, or tau, tangles).

# Changes in the Brain: Pathological Features

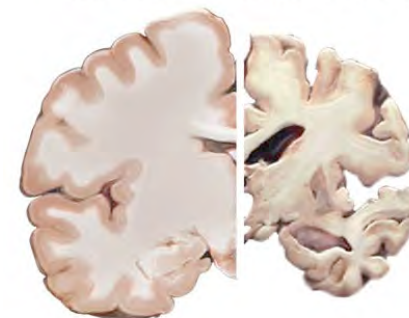
Damage to the brain starts a decade or more before memory and other cognitive problems appear



- **Amyloid plaques**- Found in the spaces between neurons, plaques consist predominantly of abnormal deposits of a protein fragment called beta-amyloid.
- **Neurofibrillary tangles**- Found inside neurons, neurofibrillary tangles are abnormal clumps of a protein called tau.
- Loss of connections between neurons in the brain and cell death.
- **Brain atrophy** (shrinking)

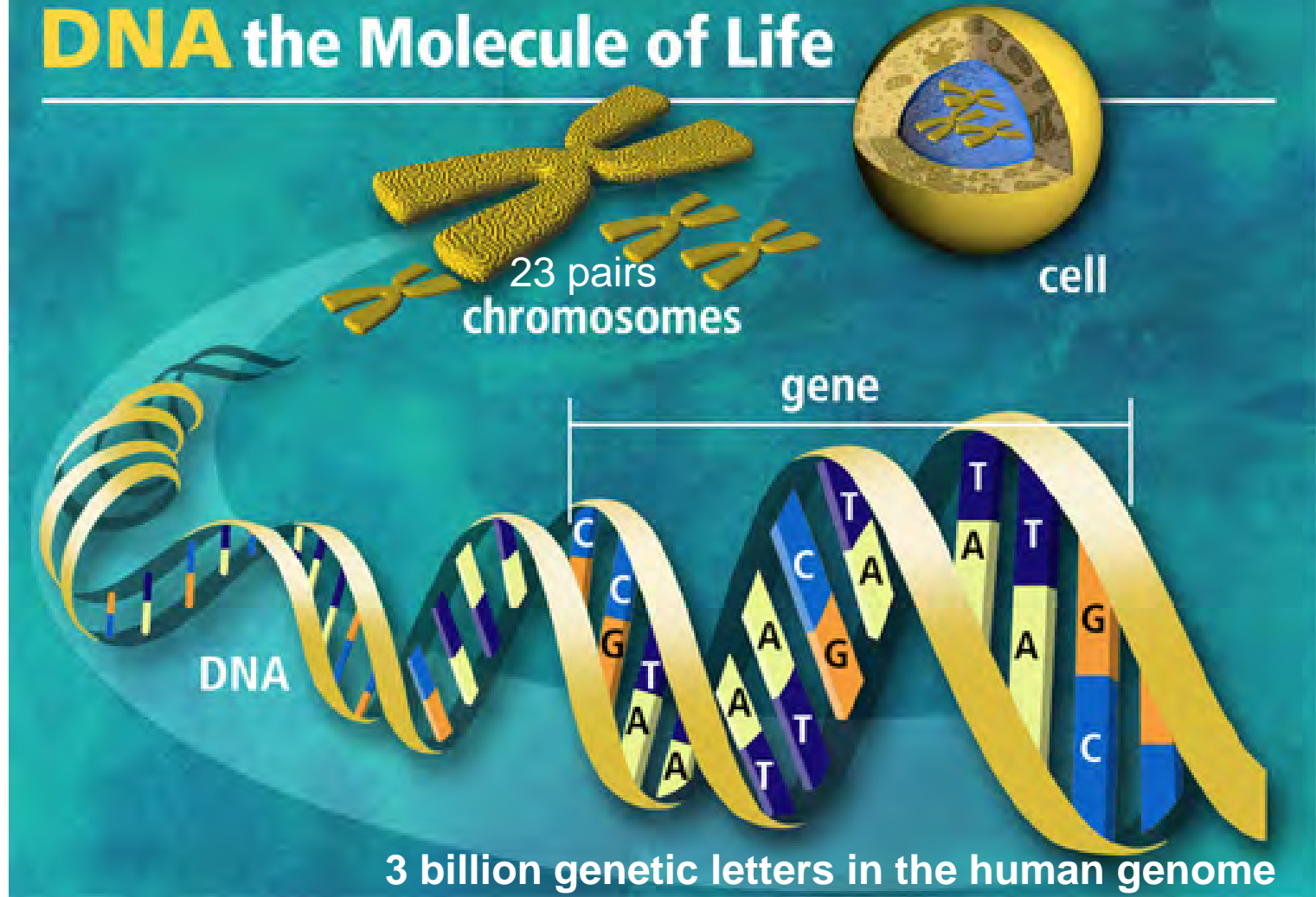


Healthy Brain      Severe Alzheimer's



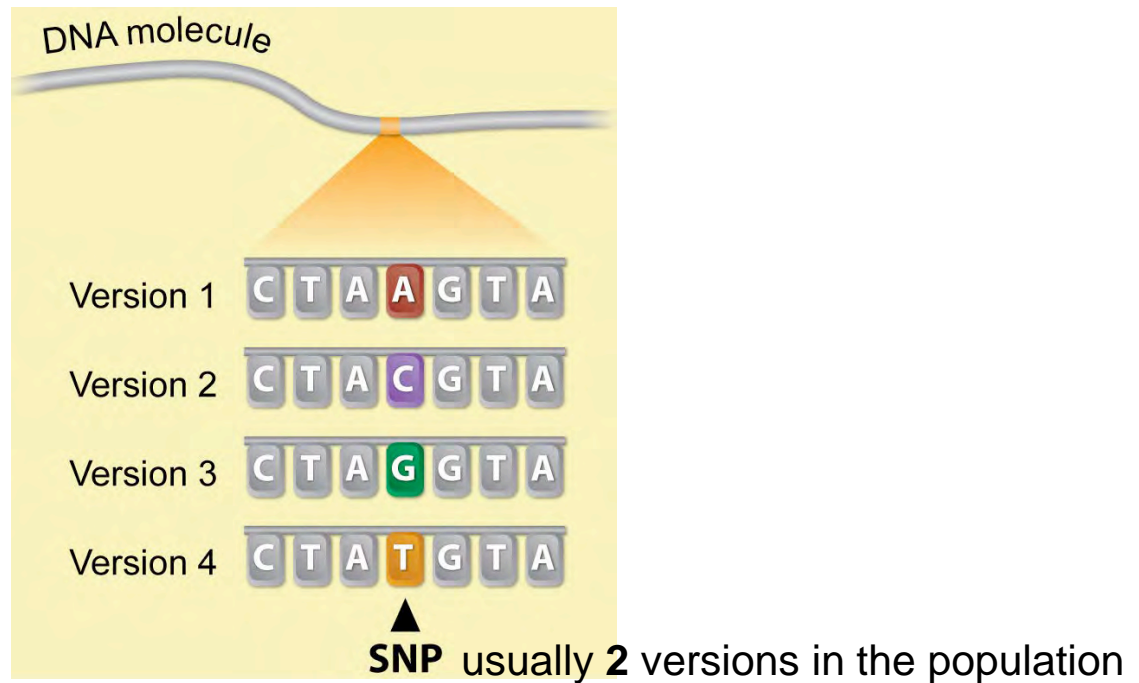
**Why are some people at a higher risk for AD than others?**

# DNA the Molecule of Life



# Gene Variants

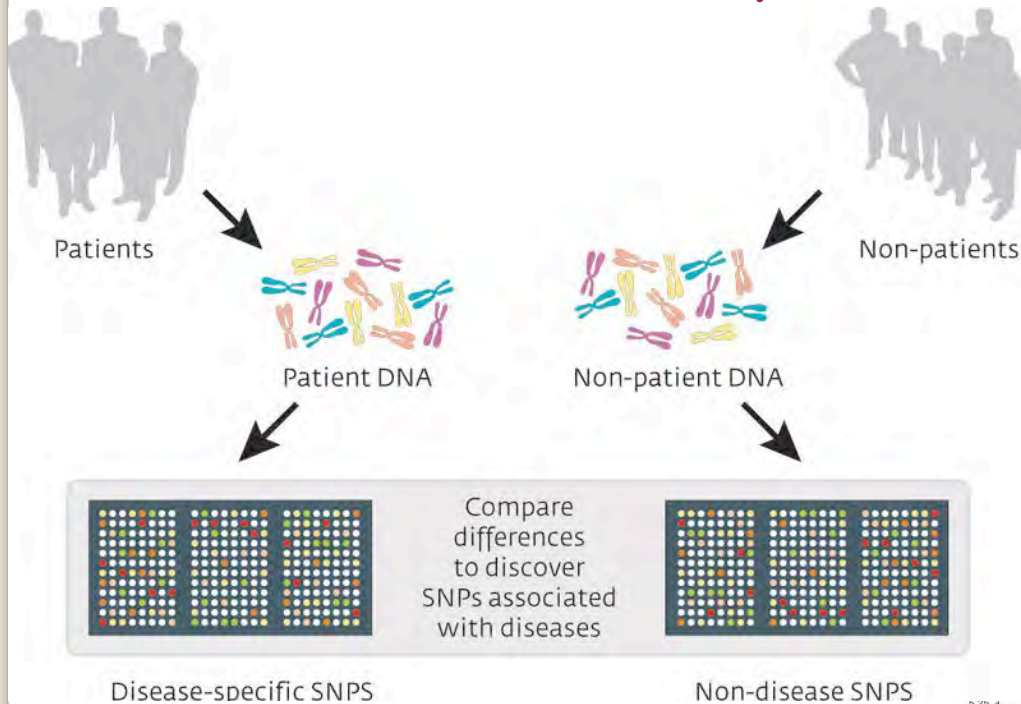
A **single nucleotide polymorphism (SNP)** is a variation in which single nucleotide may occur at some specific position in the genome, where each variation is present to some appreciable degree within a population



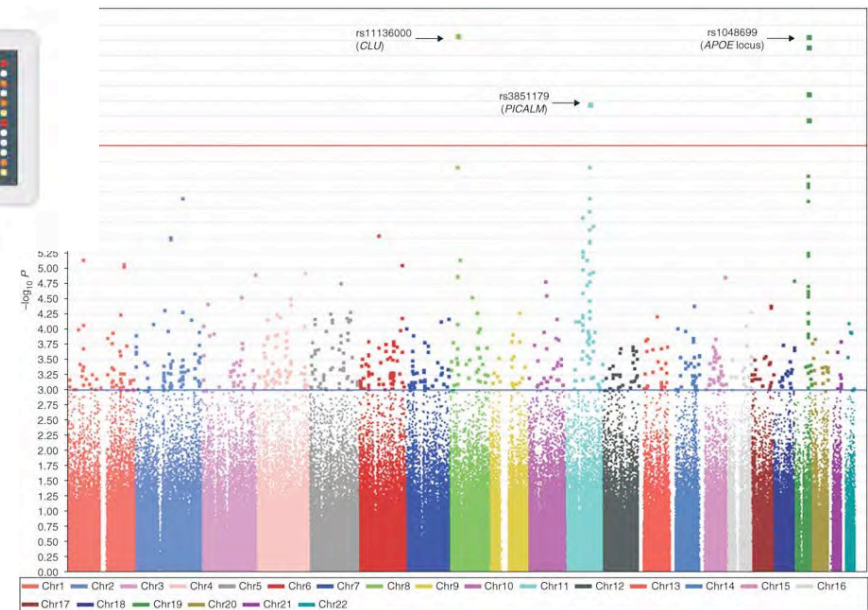


# Genome Wide Association Studies (GWAS)

Examination of many common genetic variants in different individuals to see if any variant is associated with a trait



500K-1 million tag SNPs – genetic markers – that represent 3 billion genetic letters in the human genome



# Can we reduce the risk?

- ✓ **Adapt a healthy diet.** Eat a heart-healthy diet that benefits both your body and your brain. Adopt a diet that is lower in fat and higher in vegetables and fruit.
- ✓ **Challenge your brain.** Mentally/cognitively challenging activities, such as learning a new skill or engaging in formal education, may have short and long-term benefits for your brain.
- ✓ **Enjoy socially activity.** Social engagement is associated with reduced rates of disability and mortality, and may also reduce risk for depression.
- ✓ **Be physically active.** Physical activity is a valuable part of any overall body wellness plan and is associated with a lower risk of cognitive decline.

