STOPPING ALZHEIMER'S DISEASE AND RELATED DEMENTIAS:
Advancing Our Nation's Research Agenda

BYPASS BUDGET PROPOSAL FOR FISCAL YEAR 2018

The **National Institutes of Health (NIH)** presents an annual professional judgment budget for the additional Federal funds needed to stop Alzheimer's disease and related dementias by 2025. This report outlines the toll Alzheimer's takes on our Nation and the scientific opportunities we could pursue with enhanced funding in Fiscal Year (FY) 2018. To view the NIH Bypass Budget Proposal for FY 2018, visit www.nia.nih.gov/alzheimers/bypass-budget-fy2018.

DEMENTIA AFFECTS MILLIONS OF AMERICANS

Today, more than **5 million** Americans live with Alzheimer's disease. This number is expected to climb to nearly **14 million** in 2050, unless we find ways to stop the disease. Many thousands more live with related disorders—frontotemporal, vascular, Lewy body, and other types of dementia.

5 MILLION — 2016

14 MILLION — 2050

ALZHEIMER'S IS A LEADING CAUSE OF DEATH

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Alzheimer's disease is currently ranked as the **sixth leading cause of death** in the U.S. Death rates for Alzheimer's increased from 2013 to 2014, while those for heart disease and cancer declined.

BUDGETING NOW FOR A CURE IN 2025

NIH estimates we will need an **additional $414 million** above our estimated base budget in FY 2017 toward the goal of preventing and treating Alzheimer's disease and related dementias by 2025.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health

ALZHEIMER'S IS EXPENSIVE

In the last 5 years of life for a person with dementia, health care can cost an estimated **$287,038**—roughly **57%** more than end-of-life care for heart disease and cancer patients. U.S. health and long-term care costs for dementia were as high as **$215 billion** in 2010; these annual costs may soar to **$511 billion** by 2040.

Support of the National Institutes of Health makes possible many diverse and promising lines of research—basic, translational, and clinical—such as the following research ventures:

Collaborations that speed discovery

Scientists have long been interested in how the vascular system—the body's network of large and small blood vessels—may be involved in the onset and progression of Alzheimer's disease and related dementias. To identify new targets for treatment, the Molecular Mechanisms of the Vascular Etiology of Alzheimer's Disease Consortium is dissecting the complex molecular mechanisms by which vascular risk factors influence dementia.

The Alzheimer's Disease Sequencing Project (ADSP) is discovering susceptibility genes for Alzheimer's, as well as clusters of genes that might predict risk for the disease; the rapid and open sharing of the data may lead to targeted therapies.

New models of Alzheimer's disease

Scientists are developing next-generation animal models of Alzheimer's disease at new translational centers to identify, test, and report on promising biomarkers and drug candidates that may lead to effective interventions.

Pioneering initiatives

Many people with Down syndrome have Alzheimer's-related brain changes in their 30s that can lead to dementia in their 50s and 60s. Alzheimer's Biomarkers Consortium in Down Syndrome research teams are using biomarkers to learn more about how the disease progresses in this vulnerable group.

Groundbreaking prevention trials

Clinical trials are testing promising drugs in at-risk but symptom-free volunteers. Anti-Amyloid Treatment in Asymptomatic Alzheimer's Disease (A4), for example, is testing an amyloid-clearing drug in 1,000 cognitively normal older volunteers who have abnormal levels of brain amyloid to see if it can delay cognitive decline.

Promising research findings

Recent insights point to new ways to predict who is at risk for Alzheimer's and possible targets for interventions:

- In animal models of Alzheimer's and in human disease, brain cells may not produce enough energy to remain healthy. Scientists are exploring ways to protect brain cells against this stress. For example, increasing levels of SIRT3, an enzyme, can bolster mitochondria—the cell's powerhouse—and improve stress resistance.

- A new chemical compound—T807—may detect the protein tau in the living brain, helping to identify who has Alzheimer's and the effectiveness of drugs targeting abnormal levels of tau.

- Problems with the sense of smell, or olfaction, are an early sign of Alzheimer's disease. Researchers are developing a "scratch and sniff" test that predicts risk for cognitive decline and Alzheimer's.

- Being obese or overweight in midlife has been linked to increased risk of dementia. NIH scientists have found that it may also predict earlier age of onset of Alzheimer's.

Testing of new therapeutics

Early-stage testing is underway to determine the safety of newly developed compounds:

- **LM11A-31** prevents the loss of nerve cells and the connections between them in animals.

- **BPN14770** restores the function of damaged brain synapses in animals and may be a possible treatment for Alzheimer's and other brain disorders.

- **Allopregnanolone** promotes growth of new neurons and may protect against Alzheimer's pathology in animal studies; results of human testing are pending.