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Alzheimer's Disease: A Big Sky Approach to a National Challenge
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Thank you Mr. Chairman and members of the Committee for providing me the opportunity to testify today on behalf of McLaughlin Research and the people in Montana who are or will be afflicted by Alzheimer's Disease or related dementing illnesses. MRI is an independent, non-profit research organization in Great Falls, Montana where we conduct basic biomedical research to understand, and ultimately prevent, neurodegenerative diseases like Alzheimer's, Parkinson's, and related disorders. I thank Senator Walsh and members of the Special Committee on Aging for recognizing the looming national crisis that will be caused by Alzheimer's disease and other dementias as our population ages.

The personal tragedy of dementia, the loss of identity and memory, cannot be fully comprehended by those whose family members have been spared. The suffering caused by Alzheimer's and other degenerative brain diseases of later life is reason enough to expand our efforts to find a way to prevent this illness. Unfortunately, the economic impact of dementing diseases also is immense. Currently, according to the Alzheimer's Association, 5 million Americans (~25,000 Montanans) are currently afflicted with Alzheimer's or related dementias with an annual financial cost approaching 100 billion dollars. By 2050, if nothing changes, as many as 16 million Americans could be affected, costing the economy 1.2 trillion dollars. However, investment in research can bend this cost curve.

The effectiveness of biomedical research, funded largely by the National Institutes of Health, is unquestioned. Progress against cancer and heart disease over the past 50 years, to name only two examples, has been remarkable with effective therapies that can prevent disease, prolong survival, and effect cures. For example, the impact of statins on lowering risk of coronary artery disease and heart attacks is well known. In contrast, Alzheimer's disease was identified as a distinct clinical entity over 100 years ago and there are still no therapies capable of even slowing the inexorable course of neurodegeneration. It is telling that for every $28,000 the federal government spends on caring for patients with Alzheimer's disease and related dementias, only $100 in federal funds goes to support research on these disorders. Funding data from the National Institutes of Health shows that funding for Alzheimer's disease in 2013 was approximately $412 million, in comparison to $3 billion for AIDS research, $2 billion for cardiovascular disease, and $5 billion for cancer research. Support for research into all diseases is important and results

often shed light on apparently unrelated disorders, but the financial impacts of dementia on society is now greater than those of either heart disease or cancer.

On the positive side, the Obama administration has developed and is implementing a National Plan to Address Alzheimer's Disease. Unfortunately, funding is below the levels needed to accelerate progress towards the worthy goals of developing treatments that would prevent, halt, or reverse the course of Alzheimer's disease and of improving early diagnosis and coordination of its care and treatment. Sequestration has further eroded the support available for research.

New approaches developed using mice by MRI scientists and our collaborators are being used to identify the earliest molecular changes in neurodegenerative diseases with the goal of finding markers in the blood that can indicate the presence of disease processes decades before clinical signs or symptoms appear. Although there is no treatment now, future therapeutic interventions are much more likely to be successful in the early stages of disease. We are also beginning to understand the mechanisms for the prion-like spread of Alzheimer's disease pathology within the brain, potentially offering new ways to intervene in the disease process. Recent advances show that the way disease spreads from one region of the brain to another is similar for Alzheimer's, Parkinson's, Amyotrophic Lateral Sclerosis (Lou Gehrig's disease), and frontotemporal dementia, as well as chronic traumatic encephalopathy, which arises from traumatic brain injury in athletes and our troops returning from Iraq and Afghanistan. We understand more about Alzheimer's and other dementing disease than ever and research is at a pivotal point—it is largely a matter of our elected representatives deciding that a cure is worth funding. At the same time that science is close to making a difference for people who will suffer dementing diseases, federal funding for medical research is drying up. The American people know that our nation's best weapon against disease and spiraling health care costs is biomedical research.

We at McLaughlin have started an exciting new initiative to speed up the translation of basic research findings into medical practice. To make a difference for current and future patients with dementing illness, MRI is collaborating with Benefis Health System in Great Falls to develop a Center for Aging Research & Memory Care—a unique partnership between an excellent community hospital and an internationally recognized research institution. This "center without walls" is not a place but an exciting new initiative aimed at improving patient care now and at developing new avenues to search for ways to prevent disease. As only one example, we will transplant stem cells from Alzheimer's patients into mice to watch the progression of disease in a living brain, providing a new tool to test potential therapies and giving us real hope for a cure. With Federal support shrinking, the State of Montana stepped up with a grant of nearly $1 million in 2014 as seed money for the Montana Center for Aging Research & Memory Care. Thank you Senator Walsh for your support of this appropriation when you were Lieutenant Governor.

Americans also recognize that our nation's global leadership in science is tenuous.

Our leadership position will evaporate if policymakers shortchange government support for the basic research that is essential for finding cures for disease and for fueling innovation in the private sector. Unlike the U.S., countries like China and India are rapidly increasing their investments in science. MRI scientists are receiving funding from India's National Center for Biological Sciences to help establish a mouse genetics facility and a cardiomyopathy lab at Bangalore's Institute for Stem Cell Biology and Regenerative Medicine. While this international collaboration is exciting, it points out the appreciation that other countries have developed for the importance of basic research. Before this, I had never imagined that our research in Montana would be supported by funds from a developing country.

To maintain America's leadership in biomedical research, as well a find ways to prevent dementia and other devastating diseases, it is essential that talented young people pursue scientific careers. We at MRI have observed first hand decisions by talented postdoctoral trainees, discouraged by the downturn in grant application success rates, to abandon basic research for careers that offer more security. Support from NIH is essential to foster and retain the next generation of research innovators. Innovative research cannot be turned on and off like a spigot; it only yields results over time and with consistent effort. If Congress and the Administration let funding for Alzheimer's and related disorders stagnate as inflation further eats away at its value, it will compromise progress at a time our health care system and the nation can least afford it. Discoveries made at MRI and research organizations across the country have set us on the road to finding a way to prevent or cure dementing illness; it is essential to find a way to enhance federal support for Alzheimer's disease research. Thank you Senator Walsh and members of the Special Committee on Aging for this opportunity to testify on behalf of the research community and, more importantly, families affected by dementing illness.