Alzheimer’s Disease at UR
From Bench to Bedside,
From Molecules to Mind

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A Brief History of AD Research at URMC

- T. Franklin Williams, MD: Medical Director, Monroe Community Hospital (1968-83); National Institute of Aging (NIA) Director (1983-91); Scientific Director, American Federation of Aging (1992-2002)
- Paul D. Coleman, PhD: Director, UR Alzheimer Disease Center (1990-2004); Editor-in-Chief, Neurobiology of Aging (1988-2015)
- Howard Federoff, MD, PhD (1995-2007): Director, Center on Aging and Developmental Biology—AD therapeutics and Early Diagnostic Markers
- Pierre Tariot, MD (1986-2006): Director, Memory Disorders Clinic—Involved in multiple national clinical trials
- Berislav Zlokovic, PhD (2001-2011): Director, Frank P. Smith Neurosurgical Labs—Multiple awards for work on neurovascular changes in AD
1. We haven’t stopped aging

**FIGURE 4**

Projected Number of People Age 65 and Older (Total and by Age Group) in the U.S. Population with Alzheimer’s Disease, 2010 to 2050

<table>
<thead>
<tr>
<th>Millions of people with Alzheimer’s</th>
<th>Ages 65–74</th>
<th>Ages 75–84</th>
<th>Ages 85+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>2010</td>
<td>2020</td>
<td>2030</td>
</tr>
<tr>
<td>4.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.8</td>
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<td></td>
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<tr>
<td>8.4</td>
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<tr>
<td>11.6</td>
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</tbody>
</table>

*Alzheimer’s Association: 2016 Alzheimer’s Disease Facts and Figures*
2. We haven’t cured Alzheimer’s

- Despite 15 years of clinical trials aimed at amyloid-beta, the clearest “cause” of Alzheimer’s, we have not identified a cure.
- We know much more about genes and other risk factors for the disease: *There are many more targets to go after*.
- With neuroimaging we can now track AD progression: *Early diagnosis and therapeutic efficacy*.

*Perl, 2010*  
*[Link]*
3. Funding for AD research is rising

- Dec 2010: National Alzheimer’s Project Act (NAPA) signed into Law
- In 2014, Alzheimer’s Accountability Act created path for a Bypass Budget, first enacted in 2016

Federal AD Spending

Current AD Research at URMC

- Gail V. W. Johnson, PhD, Anesthesiology
  - Understanding mechanisms involved in clearing tau from the cell
  - Grants from BrightFocus Foundation and NINDS
- M. Kerry O’Banion, MD, PhD, Neuroscience
  - Modulating innate immunity to target amyloid beta and tau
  - Effects of radiation on AD pathogenesis
  - Grants from NIA and NASA
- Alison Elder, PhD, Environmental Medicine
  - Effects of environmental particulates on AD pathogenesis
  - Grant from NIEHS (Multi-PI with O’Banion)
- Houhui Xia, PhD, Pharmacology & Physiology
  - Role and regulation of protein phosphatase-1 in synaptic transmission and memory formation
  - Grants from NIMH and NSF
Current AD Research at URMC

• Rashid Deane, PhD, Neurosurgery
  – Brain clearance mechanisms for tau and ApoE
  – Grants from NIA and NINDS

• Maiken Nedergaard, MD, DMSc, Neurosurgery, Center for Translational Neuromedicine
  – Glymphatic contribution to amyloid and tau accumulation in AD
  – Glymphatic contribution to small vessel brain disease
  – Grants from NIA, NINDS, Cure Alzheimer’s Fund, and Foundation Leducq
Current AD Research at URMC

• Charles Duffy, MD, PhD, Neurology
  – Visuospatial disorientation in aging and AD
  – Founder and CEO of Cerebral Assessment Systems, developer of Cognivue®
  – Grant from NEI

• Feng Yankee Lin, PhD, RN, School of Nursing
  – Early markers of Alzheimer’s disease and “Supernormal Aging”
  – Neuroplasticity training for cognitive aging
  – Grants from Alzheimer’s Association, NIA, and NINR

• Anton Porsteinsson, MD, Psychiatry, Director of the Alzheimer’s Disease Care, Research and Education Program (AD-CARE)
  – Part of national trial networks including ADCS, ATRI, ADNI, DOD-ADNI and GAP-NET
  – Major participant in clinical trials targeting amyloid-beta, beta-secretase, agitation, apathy and memory loss in AD patients
Opportunities

• Current URMC Investigators are involved in a wide range of preclinical, translational and patient-oriented/clinical research projects

• NIA recently released 17 new AD RFAs and PAs; anticipate continued increases in funds committed to AD research

• How can we enhance AD research at URMC?
  – Gather investigators to consider common areas for collaboration
  – Focus on developing a PO1 grant
  – Engage/Join Rochester Aging Research Center
  – Other suggestions?