



Nexus of Alzheimer's, Related Dementias & Cancer Exploring Relationships, Mechanisms and Therapeutic Implications

Date: May 25, 2016

Location: Washington, DC

Meeting Overview

Over the past decade, there have been several studies suggesting a relationship between cancer and Alzheimer's disease or cognitive decline. To date, the underlying mechanisms for how these two heterogeneous diseases may be linked are unknown; however, there may be benefits to further exploring this linkage to both unlock key understanding of disease-related mechanisms and to offer new targets for potential therapy development and prevention.

Much of the current evidence is based on analysis from large epidemiological cohorts and consistently demonstrated an inverse relationship of cancer presence with decreased Alzheimer's or dementia risk in later life. Although there are identified biological pathways that overlap in cancer and Alzheimer's disease, there is also possible selection bias as a component of the epidemiological cohort analysis, including survival bias of the cohort being analyzed and ascertainment bias from selective under-diagnosis of cancer in people with dementia. Taken together, it is impossible at this time to tease out these factors from each other and draw conclusions regarding the biological significance of a relationship between cancer and Alzheimer's. Immune mechanisms may seemingly be a potential biological link between these two disease families. Signaling pathways identified through genetics may also link these two diseases; for instance, the PIN1 gene is overexpressed in certain cancers, and the PIN1 protein is implicated for tau phosphorylation and may be linked to the hyperphosphorylation of tau seen in Alzheimer's disease.

The Alzheimer's Association and the Alzheimer's Drug Discovery Foundation will convene this one day think tank to delve into the biological underpinnings that may explain the linkage between cancer and Alzheimer's, and provide new insights for drug discovery. The goal of this meeting is to identify if there is a path forward and the specific research questions and linkages needed for next steps toward translation and the clinic.

Agenda

8:00 a.m. Breakfast Available

8:30-8:45 a.m. Welcome and Introduction

Session 1: Learning From Epidemiology: What Populations Tell Us

- 8:45-9:20 a.m. Epidemiologic Evidence Linking Cancer & Alzheimer's**
Mary Ganguli, University of Pittsburgh
- 9:20-9:40 a.m. Links in Parkinson's and ALS with Cancer: Understanding the Epidemiology**
Honglei Chen, National Institute of Environmental Health Services at National Institutes of Health
- 9:40-10:00 a.m. Interpreting Risk Relationships Between Cancer & Alzheimer's: Survival Bias and Competing Risks**
Chung-Chou "Joyce" Chang, University of Pittsburgh
- 10:00-10:30 a.m. Moderated Discussion on Epidemiological Learnings**
Moderator: Jane Driver, Brigham Women's Hospital
- 10:30-10:50 a.m. BREAK**

Session 2a: Mechanistic Links of Cancer & Alzheimer's

- 10:50-11:10 a.m. Bioenergetics: Linking Physiology in Neurodegeneration & Cancer**
Michael Lotze, University of Pittsburgh
- 11:10-11:30 a.m. Role of Inflammation**
Philip DeJager, Harvard University
- 11:30-11:50 a.m. Metabolic Theory**
Jane Driver, Brigham Women's Hospital
- 11:50-12:40 p.m. LUNCH**

Session 2b: Mechanistic Links of Cancer & Alzheimer's

- 12:40-1:00 p.m. Chaperones and Homeostasis**
Stuart Calderwood, Harvard University
- 1:00-1:20 p.m. Cognitive Sequelae of Adjuvant Endocrine Therapies**
Mary C. Tierney, University of Toronto
- 1:20-1:40 p.m. Cognitive Assessment After Chemotherapy & the Impact of "Chemo Brain"**
Timothy Ahles, Memorial Sloan Kettering Cancer Center
- 1:40-2:10 p.m. Moderated Discussion on Mechanistic Linkages (Session 2/3)**
Moderator: Suzanne Craft, Wake Forest University

2:10-2:30 p.m. BREAK

Session 3: Genetic Links of Cancer & Alzheimer's & Systems Approaches

2:30-2:50 p.m. Genetic Overlap Between Cancer & Alzheimer's
Sudha Seshadri, Boston University

2:50-3:10 p.m. Comparative Systems Biology: Relevant Genetic Pathways
Andrew Saykin, Indiana University

3:10-3:40 p.m. Moderated Discussion on Biological Underpinnings of Genetic Links
Moderator: Suzana Petanceska, National Institute on Aging at the
National Institutes of Health

Session 4: Therapeutic Implications of the Cancer – Alzheimer's Nexus

3:40-4:10 p.m. Overview of Drug Repurposing Experiences & Opportunities
Howard Fillit, Alzheimer's Drug Discovery Foundation

4:10-5:00 p.m. Synthesis of Session 1-5 & Wrap Up
Moderator: David Knopman, Mayo Clinic

5:00 p.m. DEPARTURES