Common Alzheimer's Disease Research Ontology (CADRO)

The following is a listing of the CADRO Categories, Topics, and Themes as of November 2013.

Category A. Molecular Pathogenesis and Physiology of Alzheimer's Disease
This category includes research focused on the molecular and physiological processes underlying Alzheimer's disease pathogenesis and the genetic and epigenetic determinants of AD.

1. **Amyloid**
   a. APP Structure and Function
   b. APP Processing
   c. APP Signaling
   d. Secretases
   e. Amyloid beta Clearance
   f. Amyloid beta Structure, Assembly, and Aggregation
   g. Amyloid beta-Mediated Pathogenesis

2. **Tau**
   a. Normal Functions of Tau
   b. Tau Phosphorylation, Metabolism, and Assembly
   c. Tau-Mediated Pathogenesis (AD)

3. **Presenilins**
   a. Apoptosis
   b. Calcium Signaling
   c. Autophagy
   d. Structure-Function Analysis

4. **ApoE and Lipids**
   a. ApoE in Abeta-Mediated AD Pathogenesis
   b. ApoE in AD Pathogenesis Independent of Abeta
   c. Brain Cholesterol Metabolism
   d. Lipid-Mediated Signaling
   e. Lipoprotein Receptors
   f. Nuclear Receptors
   g. Myelin

5. **Brain Circuits and Synapses**
   a. Synaptic Plasticity and Synaptic Dysfunction
   b. Selective Vulnerability
   c. Neurotransmitter Receptors Structure and Function
   d. Network Function and Failure
   e. Neurogenesis

6. **Cell Death**
   a. Apoptosis
   b. Oxidative Stress
   c. Autophagy-Mediated Cell Death
   d. Calcium-Mediated Cell Death
   e. Cell Cycle Re-Entry
   f. Ubiquitin Protease System

7. **Immunity and Inflammation**
   a. Astrocytes
   b. Microglia
   c. Innate Immunity
   d. Immunotherapy – Mechanisms of Action
   e. Inflammatory Mediators

8. **Bioenergetics**
   a. Mitochondria
   b. CNS Glucose Metabolism and Ketogenesis

9. **Vascular/Metabolic Factors**
   a. Cerebrovascular Disease
   b. BBB and Neurovascular Unit
   c. Insulin Resistance and Type II Diabetes
   d. Hypertension
   e. Dyslipidemia
   f. Atherosclerosis
   g. Obesity
   h. Metabolic Syndrome

10. **Hormones**
    a. Sex Hormones
    b. Growth Hormones
    c. Stress Hormones

11. **Genetics**
    a. Candidate Gene Approach
    b. Genome-Wide Approach
    c. Epigenetic and Epigenomic Approaches
    d. Genetic Architecture
    e. Gene-Gene and Gene Environment Interactions
    f. Expression Profiling
    g. Disease Pathways Identification
    h. Next Generation Sequencing
    i. Genetic Data Use and Analysis

12. **Other**

Category B. Diagnosis, Assessment, and Disease Monitoring
This category includes research focused on the development, testing and validation of tools and methods for diagnosing and monitoring patients with AD from the preclinical phase of the disease through advanced dementia. These methods and tools include all types of novel and established biomarkers.

1. **Fluid Biomarkers**
   a. CSF Biomarkers
   b. Blood Biomarkers

2. **Imaging Biomarkers**
   a. PET Amyloid Imaging
   b. PET Non-Amyloid Imaging
   c. Functional MRI
   d. Structural MRI
   e. Other Brain Imaging Tools

3. **Cognitive, Behavioral and Functional Assessment**
   a. Cognitive
   b. Behavioral
   c. Functional

4. **Multimodal Biomarkers**

5. **Novel Biomarkers**

6. **Novel Methodologies and Techniques**

7. **Other**

Category C. Translational Research and Clinical Interventions
This category aims to capture projects focused on the identification and development of therapies (small molecule, natural products, and biologics) for AD from early therapeutic discovery through late stage preclinical development and all stages of clinical testing. Also included are projects focused on repurposing pharmacological agents already in use for other conditions as well as non-pharmacological interventions.

1. **Drug Discovery (small molecules and biologics)**
   a. Amyloid
   b. Tau
   c. ApoE, Lipids and Lipoprotein Receptors
   d. Neurotransmitter Receptors
   e. Neurogenesis
   f. Inflammation
   g. Oxidative Stress
   h. Cell death
   i. Proteostasis
   j. Metabolism and Bioenergetics
   k. Vasculature
   l. Growth Factors and Hormones
   m. Epigenetic Regulators
   n. Multi-target
   o. Unknown target
   p. Other

2. **Preclinical Drug Development (small molecules and biologics)**
   a. Amyloid

3. **Preclinical Proof of Concept for Non-Pharmacological Interventions**
   a. Exercise
   b. Diet
   c. Enrichment
   d. Combination therapy
   e. Other

4. **Clinical Trial Design**

5. **Early-stage Clinical Drug Development (Phase I and Phase II Clinical Trials)**
   a. Amyloid
   b. Tau
   c. ApoE, Lipids and Lipoprotein Receptors
   d. Neurotransmitter Receptors
   e. Neurogenesis
   f. Inflammation
   g. Oxidative Stress
   h. Cell death
   i. Proteostasis
   j. Metabolism and Bioenergetics

6. **Late-stage Clinical Drug Development (Phase III Clinical Trials)**
   a. Amyloid
   b. Tau
   c. ApoE, Lipids and Lipoprotein Receptors
   d. Neurotransmitter Receptors
   e. Neurogenesis
   f. Inflammation
   g. Oxidative Stress
   h. Cell death
   i. Proteostasis
   j. Metabolism and Bioenergetics
   k. Vasculature
   l. Growth Factors and Hormones
   m. Epigenetic Regulators
   n. Multi-target
   o. Unknown target
   p. Other

7. **Non-pharmacological Interventions**
   a. Exercise
   b. Diet
   c. Cognitive Training
   d. Combination therapy
   e. Other

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b. Tau
c. ApoE, Lipids and Lipoprotein Receptors
d. Neurotransmitter Receptors
e. Neurogenesis
f. Inflammation
g. Oxidative Stress
h. Cell death
i. Proteostasis
j. Metabolism and Bioenergetics
k. Vasculature
l. Growth Factors and Hormones
m. Epigenetic Regulators
n. Multi-target
o. Unknown target
p. Other

k. Vasculature
l. Growth Factors and Hormones
m. Epigenetic Regulators
n. Multi-target
o. Unknown target
p. Other

8. **Clinical Therapy Development for the Neuropsychiatric Symptoms of AD**
   a. Pharmacological
   b. Non-pharmacological

9. **Clinical Ethics**

10. **Other**

Category D. Epidemiology
This category includes all types of epidemiological studies (cross-sectional, prospective, and longitudinal) aimed to examine how a variety of genetic, lifestyle, and environmental factors influence the incidence, prevalence, and clinical course of AD.

1. **Genetic/Epigenetic Risk**

2. **Cardiovascular and Metabolic Factors**

3. **Nutrition and Other Environmental Factors**

4. **Multimodal Risk Factors**
   a. Hispanics
   b. African-Americans
   c. Japanese-Americans
   d. Multi-Racial/Cross-Cultural
   e. International (Israel, Sweden, China, India)
   f. Women
   g. Oldest Old
   h. Other

5. **Other**

Category E. Care, Support and Health Economics of Alzheimer's Disease
The research in this category includes projects aimed at improving the quality of care and quality of life for AD patients in a variety of care-giving settings (e.g., in the home, nursing home facilities, hospice programs) and across diverse populations. This category also includes research focused on alleviating the physical and emotional burden associated with caregiving as well as projects focused on assessing the socioeconomic burden of AD.

1. **Care Interventions and Quality of Life**
   a. Cognitive Training Interventions
   b. Health and Wellness
   c. Behavioral Interventions
   d. Hospice and End-of-Life Care
   e. Staff Training and Professional Development
   f. Assessment and Metrics
   g. Neuropsychological Interventions
   h. Other Interventions

2. **Technology Assisted Care**
   a. Personal Device Assisted Care
   b. Computer Assisted Care
   c. Environmental Modifications
   d. TV/Video Assisted Care
   e. Other Technology Assisted Care

3. **Caregiver Support**
   a. Caregiver Training
   b. Home-Based Support
   c. Behavioral Interventions
   d. Relationship Interventions
   e. Assessment and Metrics

4. **Cultural Values and Beliefs**
   a. Chinese
   b. American Indian
   c. African Americans
   d. Latino/Hispanic
   e. Japanese
   f. Assessment and Metrics

5. **Economic Burden of Alzheimer's Disease**

6. **Other**

Category F. Research Resources

This category includes a variety of resources used to conduct, translate, and disseminate high quality AD research such as research centers, infrastructure (e.g., various cores), data and tissue repositories and projects focused on generating disease models. Training and career development programs are also included in this category. Projects in this category may also be reflected in Categories A-E based on scientific relevance.

1. **Alzheimer's Disease Centers**
   a. Administrative Core
   b. Clinical Core
   c. Data Management and Statistics Core
   d. Education and Information Core
   e. Neuropathology Core
   f. Imaging Core
   g. Optional Cores

2. **Other Types of Cores** (e.g., program projects)

3. **Professional and Career Development**
   a. Faculty Recruitment
   b. Clinical Scientist Career Development
   c. Training Grants
   d. Conferences/Workshops/Symposia

4. **Repositories and Bioinformatics Tools and Resources**
   a. Biobanks
   b. Data Repositories
   c. Bioinformatics

5. **Infrastructure** (including equipment, construction, technology, etc.)

6. **Disease Models**
   a. Invertebrates
   b. Vertebrates
   c. Rodents
   d. Higher Mammals
   e. iPS Cells

7. **Other**

Category G. Consortia and Public Private Partnerships

This category includes partnership enterprises created to enable major national and international efforts in basic and translational AD research. Projects categorized in this category may also be reflected in Categories A-F based on scientific relevance.

1. **Consortia**

2. **Public Private Partnership**