National Institute on Aging
Geriatrics and Clinical Gerontology Program

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<tr>
<th>Geriatrics Branch</th>
<th>Clinical Gerontology Branch</th>
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<td><strong>Focus on the aged:</strong></td>
<td><strong>Focus on aging over the life span:</strong></td>
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<td>Treating or preventing problems in older persons</td>
<td>Altering progressive aging changes</td>
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<td>Previously undefined pathologies in old age</td>
<td>Processes leading to age-related pathologies</td>
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<td>Late-stage disease</td>
<td>Early pathophysiology</td>
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<td>Comorbid interactions</td>
<td>Common factors leading to multiple age-related pathologies</td>
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**Shared foci:** Disease/disability prevention in old age, progression of aging pathologies in late life
Geriatrics and Clinical Gerontology Program:  
Examples of Research Emphases

- Geriatric conditions and functional problems (frailty, incontinence, auto driving disabilities, poor hip fracture recovery)
- Age-related issues in disease diagnosis, prevention, and treatment, e.g., effects of comorbidity
- “New” diseases of old age (vascular stiffening, sarcopenia)
- Hormonal therapies (estrogen, testosterone, growth hormone)
- Physical activity’s effects on aging changes and age-related morbidity and disability
- Aging before old age (reproductive aging, early physiologic changes)
- Exceptional longevity and exceptionally healthy aging
- Health implications of findings from basic aging research
Recent Activities and Plans
Goal 1: Geriatric Conditions

Goal 1: Identify risk factors and test interventions for “geriatric conditions”: disabilities, symptoms, vulnerabilities to stressors.

• Disability and Rehabilitation
  – Musculoskeletal Research Conference (with NCMRR and others)
  – NIH “State-of-the-Science” Conference on Urinary and Fecal Incontinence

• Vulnerabilities
  – Emergency care
  – Special considerations during hospitalization
    • Surgical management
    • ICU care
  – Vulnerabilities to infection in long-term care
Recent Activities and Plans
Goal 1: Geriatric Conditions

• Symptoms and Palliative Care
  – Fatigue
    • NIA Exploratory Workshop “Unexplained Fatigue in the Elderly”
    • AGS Conference on Fatigue
  – Pain (with NNA)
    • NIH-wide PA “Mechanisms, Models, Measurement, and Management in Pain Research”
    • Workshop in FY2008
Recent Activities and Plans
Goals 2 and 3: Diseases in Old Age

• Factors in old age that influence risk or progression
• Age-related differences in accuracy of diagnostic measures or in responses to interventions
• Test improved diagnostic or therapeutic approaches based on above data

• Cardiovascular Disease in Older Patients
  – Society for Geriatric Cardiology Conference Series: Pivotal Research in Cardiology in the Elderly
    • Acute Coronary Syndromes (2002)
    • Heart Failure (2004)
    • Cardiac Arrhythmias in the Elderly (2006)
    • Preventive Cardiology in the Elderly (2007)
Recent Activities and Plans
Goals 2 and 3: Diseases in Old Age

• Anemia in the Elderly
  – American Society of Hematology Workshop
  – RFA on Anemia in the Elderly (with NHLBI)
  – GCG Clinical Trials Workshop

• Cancer in the Elderly
  – NIA/NCI P20 Program

• Venous Thrombosis and Thromboembolism
  – US Surgeon General’s Workshop
  – American Society of Hematology Workshop
  – RFA in progress (with NHLBI and ODS)
Recent Activities and Plans
Goals 2 and 3: Diseases in Old Age

- **New Areas**
  - Hypertension, Renal Function, Kidney Disease
  - Pulmonary Disease
    - Workshop on the Aging Lung (with BAP)
    - Asthma in the Elderly
  - Endocrinology
    - Thyroid Function and Disease in Older Patients
  - Infectious Diseases
    - HIV/AIDS in Older Persons
    - Preventing and Controlling Infections in Aggregate Living Facilities
Recent Activities and Plans
Goal 4: Comorbidity

Focus: Clinical and functional effects of interactions of diseases and treatments

- Efficacy of interventions to prevent or treat adverse interactions, and multiple coexisting risk factors for adverse outcomes
- Clinical and functional effects of interactions of comorbid conditions, and of their therapies

- NIA Task Force on Comorbidity
- RFA: Developing Interventions for Multiple Morbidities
- AGS Conference on Comorbidity
- Animal Models of Comorbidity in Aging Workshop (with BAP, NNA, and other ICs)
Recent Activities and Plans
Goal 5: Unrecognized Pathologies

**Goal 5:** Identify previously unrecognized pathologies in older persons and develop and test diagnostic and treatment approaches.

- **Frailty**
  - PA on Frailty in Old Age: Pathophysiology and Interventions
  - AGS Conference on Frailty in Older Adults
- **Cytokinemia**
  - RFA on Inflammation, Inflammatory Mediators, and Aging (with BAP, NNA)
Recent Activities and Plans
Goal 5: Unrecognized Pathologies

• Pathologic consequences of putative aging mechanisms (with Goals 6 and 7)
  – Mitochondrial changes
    • Lipid metabolism
    • Insulin sensitivity
  – Impaired endothelial function
    • Vascular stiffening
    • Exercise tolerance

• Low Testosterone
  – Institute of Medicine Report
  – RFA for Planning Project for Testosterone Trials in Aging Men
Recent Activities and Plans

Cross-Cutting Issue: Selecting Types of Outcome Measures

Problem:

• Many ways to characterize outcomes in old age, each addressing an important aspect of clinical problems (e.g., functional status, disease-related outcomes, QOL)

• Outcomes in epidemiologic and intervention studies depend on investigators’ interests and design considerations

• Potential advantage to expand outcome measures to provide additional information on study topic and to assist in planning intervention studies

Plan:

• Workshop to identify criteria for selecting range of measures and appropriate analytic approaches for individual studies
Goals 6/7: Characterize changes across the life span that influence the risk of age-related diseases. Identify their interactions and determinants of their rates of progression. Identify significant aging changes occurring in early and mid-life and determine consequences for changes in later life.

Recent Activities and Plans:

- Longitudinal Data on Aging Working Group (with BAP, NNA and BSR)
- NIA Database of Longitudinal Studies
- NIA and NIBIB Meeting on Bioimaging and Sensor Technologies and SBIR PA “Applications of Imaging and Sensor Technologies for Clinical Aging Research”
Recent Activities and Plans:

• NIA RFA,”Aging Across the Life Span: Longitudinal Data Analyses” (with NNA and BSR)

• NIH Workshop on Assessing and Improving Measures of Hot Flashes (NIA co-sponsor)

• NIH State-of-the-Science Conference on Management of Menopause-Related Symptoms

• NIA RFA,”Biology of the Perimenopause: Impact on Health and Aging in Non-Reproductive Somatic and Neuronal Tissues” (BAP)
Recent Activities and Plans:

• Recent focus on “juvenile protective factors”
  – active during one or more developmental stages, and
  – prevent specific adverse changes from occurring when they are active, and
  – diminish or disappear at or before maturity

• NIA and NICHD Meeting on Factors in Youth that Protect Against Aging Processes (with BAP and NNA)
  – How to identify such factors, if they exist?
  – How to examine potential beneficial and/or adverse effects of such factors on aging in adults if they were maintained or restored after maturation?
Research Opportunities and Future Plans:

– Initiative on juvenile protective factors
– Think Tank on New Interventions for Menopausal Symptoms (NIMS)
– Meetings focusing on translation of findings on mitochondrial dysfunction and endothelial dysfunction
– Statistical Methods for Longitudinal Data Workshop
– Second Meeting of the LDA Working Group- Focus on translational epidemiologic research
**Goal 8:** Identify protective factors contributing to *exceptionally healthy aging*, e.g., exceptional longevity, exceptional “health span” or exceptionally slow rates of decline in physiologic characteristics.
# Recent Activities and Plans

**Complementary Strategies to Identify Genetic and Other Factors that Contribute to Exceptional Survival in Humans**

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<th>Longevity Consortium</th>
<th>Long Life Family Study</th>
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<tr>
<td>Large population cohorts</td>
<td>Long-lived families</td>
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<td>Identify effects of <strong>common</strong> genetic variants with <strong>small-moderate</strong> effects</td>
<td>Identify patterns of inheritance; <strong>rare</strong> genetic variants with <strong>large</strong> effects</td>
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<tr>
<td>Collaboration among basic scientists and epidemiologists: Test effects of candidate loci implicated by laboratory animal studies</td>
<td>Collaboration among geneticists, epidemiologists, and demographers: Develop methods to analyze familial survival data</td>
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Recent Activities and Plans

• NIA RFA, “Aging Across the Life Span: Longitudinal Data Analyses”

• Workshop on Uses of Survival Data in Research on Factors Affecting Aging (with BAP and BSR)

• Development of new projects from findings generated by current projects
  – Longevity Consortium: Genetic association and confirmation studies
  – Long Life Family Study: Familial patterns and phenotypes of exceptional survival

• Participation in NIH-wide initiatives such as the “Genes and Environment Initiative” to provide insights into contributors for exceptional survival
Goal 9: Develop and test human interventions that may affect aging rates, life span, or health span.

- Clinical Trials Operations Support Center (CTOSC)
  - Development, implementation, and maintenance of an effective NIA-wide clinical trials quality assurance and safety surveillance program
  - Clinical trials operations and quality assurance
  - Safety-related operations
  - Biostatistics

- Standing Advisory Group
- Clinical Trials Networks
Research Opportunities for Clinical Trials in Aging

- Multiple-risk-factor-reduction trials
- Interventions to prevent subsequent additional morbidities in high-risk groups
- Trials to prevent disabilities
- Interventions against anemia and/or low hemoglobin
- Interventions to alleviate or prevent symptoms and complaints
Interfaces with Clinical Specialties

GCG supports educational and research goals of professional organizations with missions relevant to research in aging by:

- Participation in educational and research activities at annual scientific meetings
- Collaboration in planning workshops to identify research opportunities
- Service on standing committees and review groups
- Support of conferences and Summer Training Institutes
- Development of research initiatives in scientific areas of mutual interest
Interfaces with Clinical Specialties

Future Program Development Considerations

• What kind of research do we want?
  – How to focus specialty research on problems of the elderly

• What incentives will get sustained engagement of strong researchers from these fields on important aging problems?
  – Interactions with professional societies
  – Funding opportunities as incentives

• How can NIA stimulate interdisciplinary collaborations among the clinical specialties on aging topics?

• How can NIA best interact with other NIH components to enhance the involvement of clinical specialties in aging research?
Aging Translational Research
Domains of Interest

- Clinical implications of basic aging research findings
- Development of new interventions/diagnostics based on clinical and/or basic aging research
- Follow-up of findings from small-scale clinical studies to larger scale studies or trials
- Increased incorporation of new knowledge from intervention studies into health practices of individuals and caregivers
Program Activities

NIA Workshop on Aging Translational Research (BAP)

• Most researchers do not understand the process of moving an idea from basic research to the clinical realm.

• “Educational” component to address regulatory issues, IP and patent issues, Pharma perspective on translational research and existing NIH Roadmap Initiatives
  – Clinical Translational Science Awards (CTSAs)
  – NIH-Rapid Access Intervention Development (RAID) Pilot Program

• Discussion of research opportunities on:
  – Diastolic Dysfunction
  – Mitochondrial Dysfunction/Insulin Resistance
  – Immune Function/Vaccine Response
  – Physical Function/ Disability
Developing Clinician-Investigators in Aging

• Need for differing types of clinician-investigators

• Interfaces with multiple clinical specialties

• Attracting high-quality students, fellows, and junior faculty

• Providing continuum of support through career development pathway

• Enhancing quality of mentorship
Research Career Development

Recent and Current Activities

• NACA Working Groups on clinical investigator career development (previous and upcoming)

• NIA-Beeson collaborative initiative (K-series awards)

• Targeted K08 RFA (Genetic Epidemiology and Aging)
Research Career Development

Future Plans/Potential New Strategies

• Collaborative career development initiatives with professional societies
• New targeted career development RFAs?
• Support for “pre-K” researchers (analogous to Williams, Jahnigen awards, possibly for longer duration)
• Emphasizing role of other mechanisms besides career awards
  • Mentor’s awards and Mentoring awards
  • Other “start-up” mechanisms (R03, R21)
  • New Investigators R01
• Expanding junior aging researchers’ use of NIH Roadmap infrastructure, e.g., Clinical and Translational Science Awards
“They’re harmless when they’re alone, but get a bunch of them together with a research grant and watch out.”