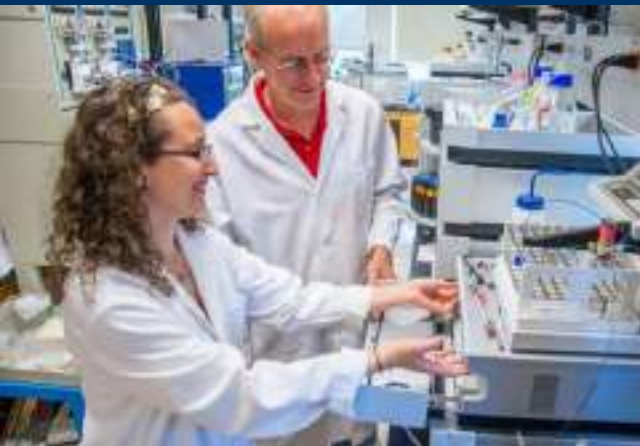


# Institute of Medicine

*Advancing Human Health and Wellbeing in Maine and Beyond*



Kody Varahramyan  
Vice President for Research  
and Dean of the Graduate School

David Harder  
Director of the Institute of Medicine

## Over 100 Faculty in Health and Life Sciences

### Health Sciences

- Nutrition
- Nursing
- Kinesiology
- Pre-Med
- Bio-informatics
- Biomedical Sciences
- Biomedical Engineering
- Psychology

### Life Sciences

- Biology
- Biophysics
- Biochemistry
- Neuroscience
- Microbiology
- Social Work
- Sociology
- Ethics
- Communication Sciences and Disorders

## Pre-Med Programs

**Animal and Veterinary Sciences**

**Biology**

**Biomedical Engineering**

**Chemistry**

**Food Science and Human Nutrition**

**Health Professions**

**Kinesiology and Physical Education**

**Molecular and Biomedical Sciences**

**Neuroscience**

**Psychology**



## Undergraduate Programs

Biochemistry  
Biology  
Biomedical Engineering  
Biophysics  
Communication Sciences and Disorders  
Child Development and Family Relations  
Microbiology  
Human Development  
Health Professions  
Nursing  
Kinesiology and Physical Education  
Psychology  
Molecular and Cellular Biology  
Social Work  
Food Science & Human Nutrition



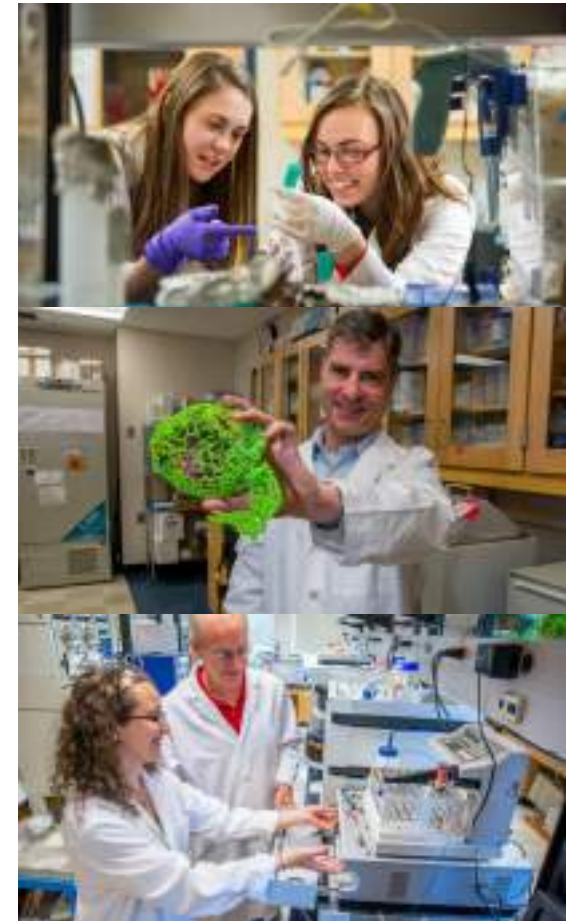
## Graduate Programs and Research

### Master's Programs

- Biochemistry
- Biomedical Engineering
- Bioinformatics
- Microbiology
- Communication Sciences & Disorders
- Psychological Sciences
- Social Work
- Nursing
- Family Nurse Practitioner
- Kinesiology and Physical Education
- Food Science and Human Nutrition

### Doctoral Programs

- Biomedical Science
- Biological Sciences
- Biochemistry and Molecular Biology
- Clinical Psychology
- Psychological Sciences
- Biomedical Engineering
- Microbiology
- Food Science and Human Nutrition



## Genesis



## UMaine Medicine Initiative

- Launched in Fall 2018
- Provided coordinated and synergistic support for growth and development of research and scholarly activity in health and life sciences at UMaine
- Better positioned the university with related community outreach and engagement efforts

## UMaine Medicine



## Key Outcome

Emergence of a transformative and coordinated community of collaborating researchers and educators, who in partnership with health care providers and other stakeholders are dedicated to the advancement of human health and wellbeing in the state of Maine and beyond, through discovery and learning in health and life sciences, from basic and translational research, to clinical practices and healthcare workforce development.

## Reasons for Transitioning from UMaine Medicine to Institute of Medicine



- To further grow the benefits derived from UMaine Medicine
- To build on the solid foundation created by UMaine Medicine
- To provide the Institute the proper status that would enable optimum growth in research and scholarly activity in health and life sciences, in conjunction with engagement with the outside world.





## Vision

To make Maine a model for a healthy state.

## Mission

To develop through innovative and coordinated research, education, and strategic partnerships transformative solutions that enhance the health and wellbeing of the citizens of Maine and beyond.

## Goals

To advance medicine and healthcare in Maine and beyond.

To elevate the University's prominence in health and life sciences.

To develop a national model for rural medicine and healthcare.

To enable attainment of external resources to support the Institute's mission goals.

## Benefits

- To support in a coordinated and synergistic manner faculty, staff, and students engaged in research and scholarly activity in health and life sciences
- To bring the relevant university centers under the same umbrella, synergizing them to reach their full potential and impact
- To provide the platform for the creation of new centers of excellence in health and life sciences
- To grow the university's state-wide and national partnerships, including with hospitals and healthcare providers
- To enable significant increase in external funding in support of faculty research and scholarly activity in health and life sciences
- To capitalize on existing partnerships and develop new ones with institutions in Maine and beyond to enhance workforce development.



## Organizational Structure

### **Leadership Team**

**Institute Director and the heads of its major centers and partnering units and programs.**

### **Steering Committee**

**Representation from the health and life sciences community from across the university working closely with the Leadership Team.**

### **External Advisory Committee**

**Representation from major healthcare systems in Maine working closely with the Leadership Team.**



## Getting Affiliated with the Institute

Affiliation with the Institute follows the University of Maine Research Center and Institute Faculty Appointment Guide.

The appointment types consist of Joint, Associate, Research, and External Associate.



## Research Thrust Areas

### **Rural Health**

Rural Healthcare & Community Wellbeing

### **Medical Humanities**

Arts & Bioethics & Social Sciences



### **Diagnostic Medicine**

Bioimaging & Radiomics

### **Immune System**

Diseases & Disorders

## Major Anticipated Outcomes

Enhance interactions with area health care providers including Northern Light Health Care (EMMC, Acadia, etc.), St. Joseph Healthcare, Penobscot Community Health Center and others.

- **Development of Research MOUs will foster collegial interaction between University faculty, physicians and other healthcare providers.**
- **Provide guidance on matters related to health and life sciences including: translational research, public health, rural outreach, community engagement, and workforce development.**
- **The Institute will serve as a bridge connecting the healthcare community with the University**

## Major Anticipated Outcomes

Enhance interactions with research institutions including MDI Biological Laboratory, The Jackson Laboratory, Maine Medical Center Research Institute, and other colleges and universities within the state and beyond.

- **Development of core resources encouraging scientific collaboration and maximization of resources.**
- **Host symposium and workshops on a statewide and national level highlighting research done in Maine.**
- **Strengthen biomedical and engineering research education and training throughout the state.**

## Major Anticipated Outcomes

Serve as an umbrella under which faculty engaged in life sciences, social sciences, biomedical engineering and biophysics can find common ground and an enhanced profile.

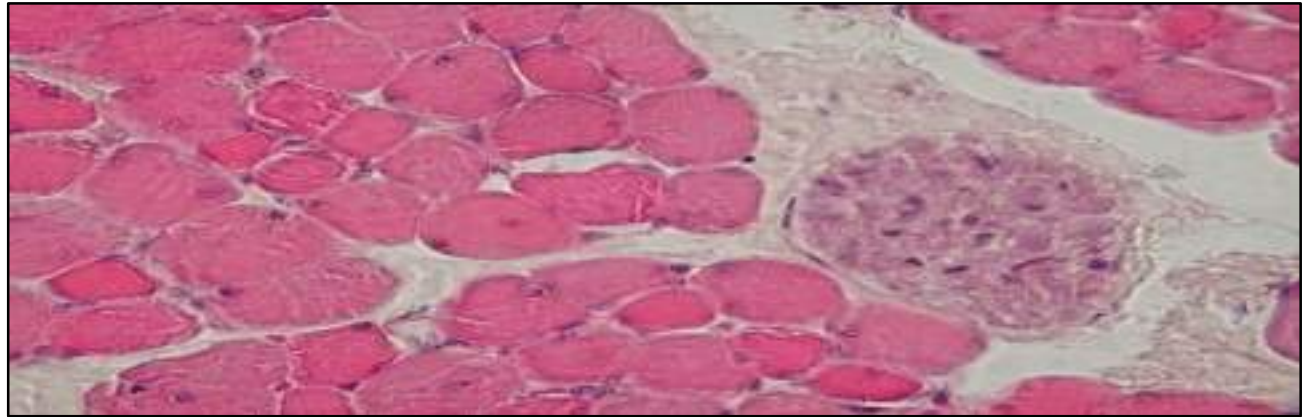
- Enhance the University's profile with NIH and other agencies with the goal of increasing funding and development of centers of research excellence.
- To support in a coordinated and synergistic manner faculty, staff and students engaged in research and scholarly activity in health and life sciences.
- To enable the university to realize its expected role as the state's foremost institution in setting agendas for the realization of health and life sciences R&D and community engagement in Maine, thereby, driving social and economic growth.



## Example of a Current Research Project

### Muscle and Healthspan

This project is centered on the discovery of mechanisms that underlie skeletal muscle plasticity and health, using the zebrafish model. The research of skeletal muscle is important because its quality predicts immune system health, better recovery from illness and injury, and healthy aging.



Dr. Clarissa Henry



Dr. Ben King



Dr. Sam  
Hess



Dr. Josh Kelley

## Example of a Current Research Project

### **Mast Cell and Mitochondrial Disruption by Triclosan and Related Antimicrobials**

This project investigates the effects of Triclosan (TCS) and TCS substitutes on plasma membrane potential, mast cell function, mitochondria and various cell types. Dr. Gosse has previously discovered that TCS inhibits the function of mitochondria and immune cell type mast cells.



Dr. Julie  
Gosse



Dr. Robert  
Gundersen



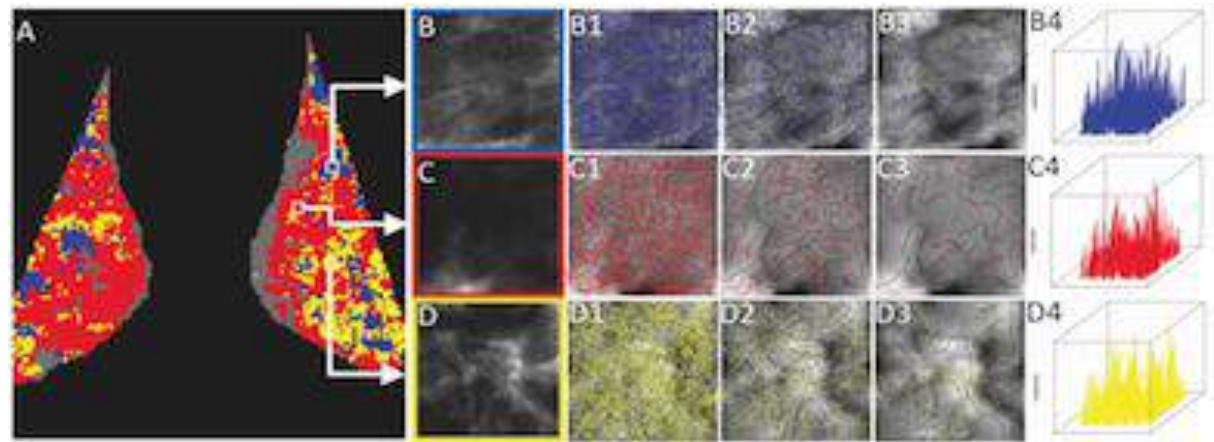
Dr. Sam  
Hess



## Example of a Current Research Project

### Bridging the Gap in Breast Cancer Imaging

Continued efforts are needed to improve the diagnostics and understanding of breast cancer, which affects nearly 1 in 8 women in the United States. Building on Dr. Khalil's previous work in this area, this project is focused on finding the missing link to bridge the gap of tumor microenvironmental knowledge from the research bench to clinical imaging.



Dr. Andre Khalil



Dr. Karissa Tilbury



Dr. Scott Collins

## Example of a Current Research Project

### Negative Pressure Wound Therapy

The long-term goal of this project is to develop medical implants that reduce the likelihood of post-surgical infection. The team is working on the design and manufacturing of a prototype implant using this new technology.



Dr. James  
Weber, DVM



Dr. Kristy Townsend



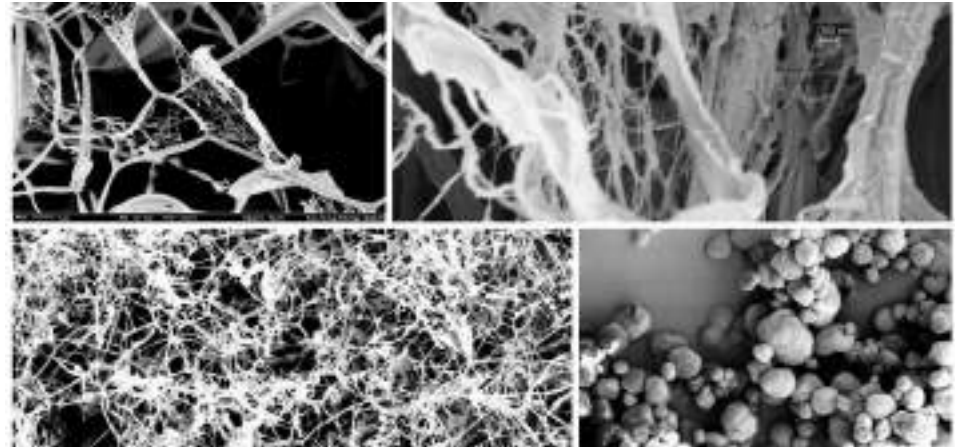
Dr. Ian  
Dickey, MD



Dr. David  
Neivandt



Dr. Anne  
Lichtenwalner



## Example of a Current Research Project

### Role of Extracts from Wild Blueberries on Wound Healing

The Klimis-Zacas lab recently documented in vitro that a chemical compound extracted from Maine wild blueberries increased the speed of wound closure by 38% above the control. In light of these findings, the team is now working to validate those results and design a patch or spray prototype to be tested on humans.



Dr. Dorothy  
Klimis-  
Zacas



Dr. Kristy  
Townsend



Dr. James  
Weber, DVM



For more information visit

[www.umaine.edu/medicine/](http://www.umaine.edu/medicine/)

**Institute of Medicine**

**Office of the Vice President for Research and  
Dean of the Graduate School**

**University of Maine**

**York Village #6**

**Orono, ME 04469**

**Phone: 207.581.3026**

**Email: [cecile.ferguson@maine.edu](mailto:cecile.ferguson@maine.edu)**

Thank you!

Questions?



# Maine Chronic Kidney Disease (ME-CKD) Genetics Pilot Study

Benjamin King, Ph.D.  
Department of Molecular and Biomedical Sciences  
UMaine Institute of Medicine  
University of Maine

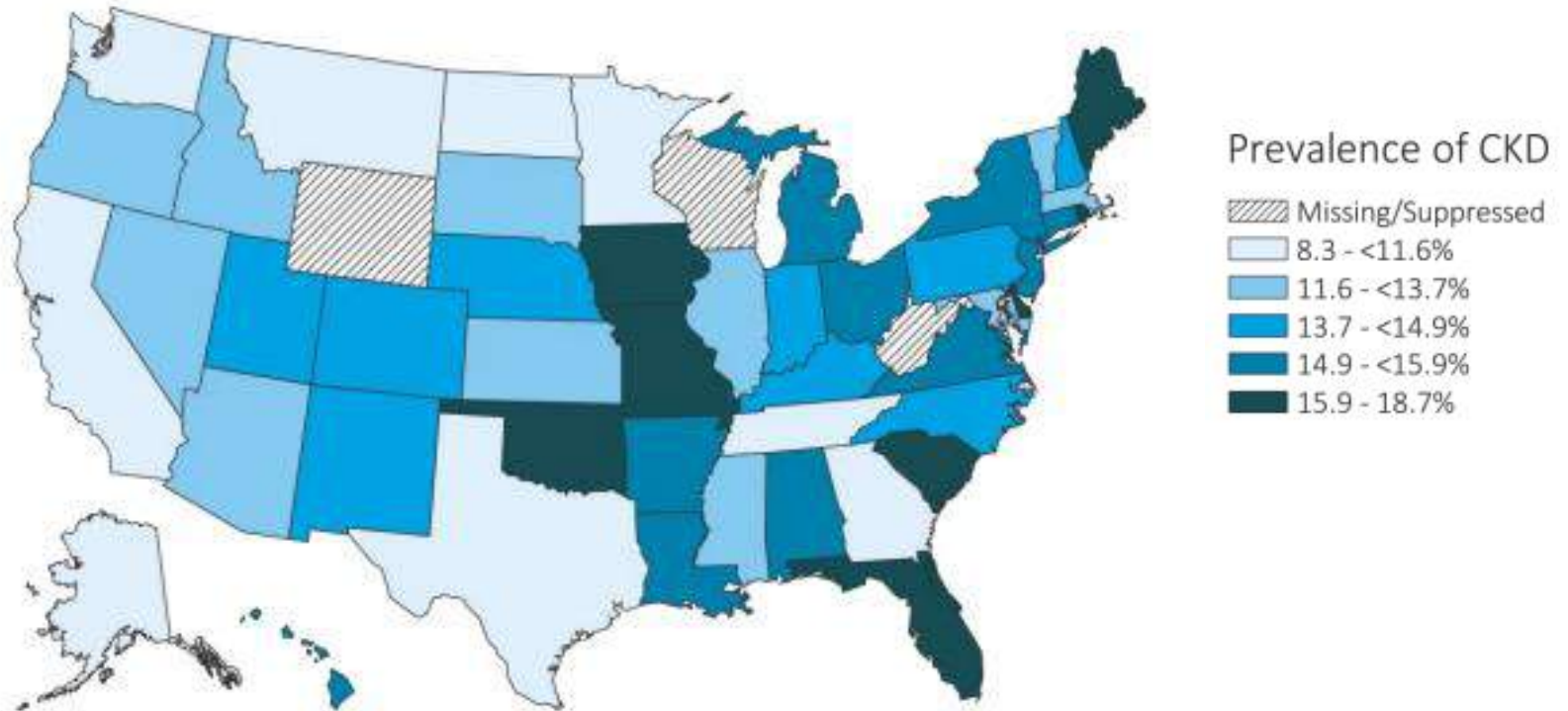
Jim Jarvis, M.D., FAAFP  
Director of Education and Clinical Research Center  
Northern Light Eastern Maine Medical Center



# Prevalence of Chronic Kidney Disease (CKD) in Maine

21,820 individuals in Maine on Medicare had CKD  
1,124 of these individuals were on dialysis

**8<sup>th</sup> Highest State Among Medicare Recipients (65+)**



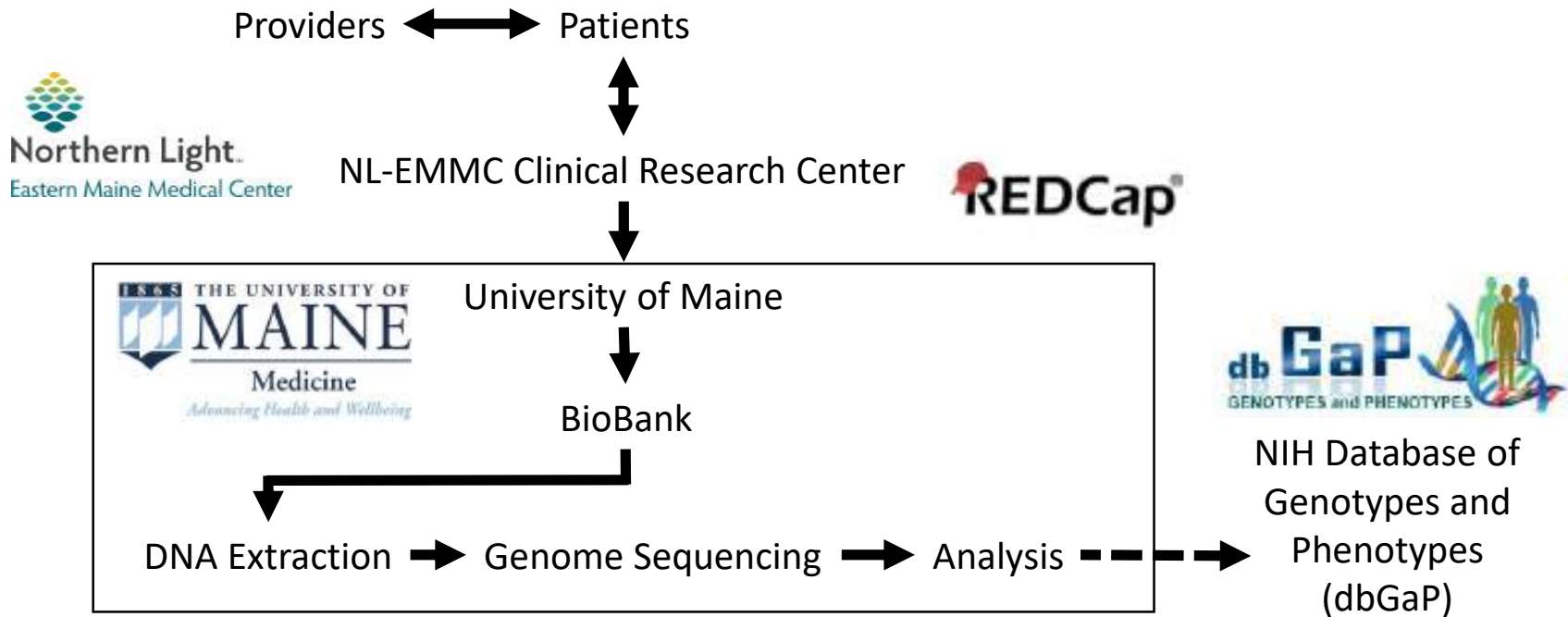
## Primary objective:

- 1) Identify putative genetic loci that increase risk for CKD

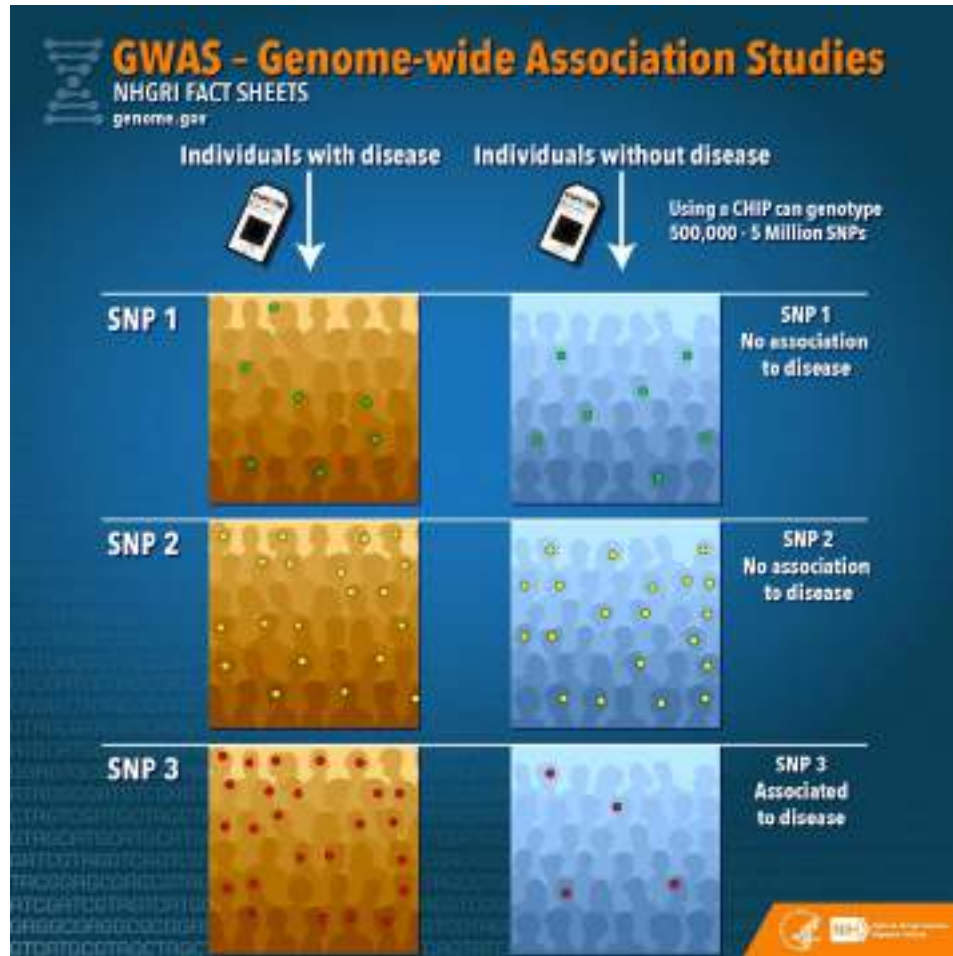
## Secondary objectives:

- 1) Examine associations between known CKD risk loci among study participants
- 2) Compare genetic data with other CKD studies as a way of assessing whether study participants are a representative cohort of CKD subjects

## High-Level Summary of Protocol



# Genome-Wide Association Studies (GWAS) Associate Genetic Loci with Disease Phenotypes



# Unique Aspects of ME-CKD Genetics Pilot Study

## Inclusion Criteria

1. Provision of signed and dated informed consent form
2. Stated willingness to comply with all study procedures and availability for the duration of the study
3. Male or female, aged 18 or older
4. **Diagnosed with Stage II, Stage III, or Stage IV CKD**
5. Ability to provide a blood sample

## Exclusion Criteria

Diagnosed with any of the following:

1. Stage I CKD
2. Stage V CKD
3. Diabetes
4. Cystic kidney disease
5. Glomerulonephritis
6. Cancer

**Participant genomes will be characterized using whole genome shotgun sequencing**

## All of Us Research Program

**Goal: Create one of the largest and most diverse health databases to accelerate biomedical research and improve health.**

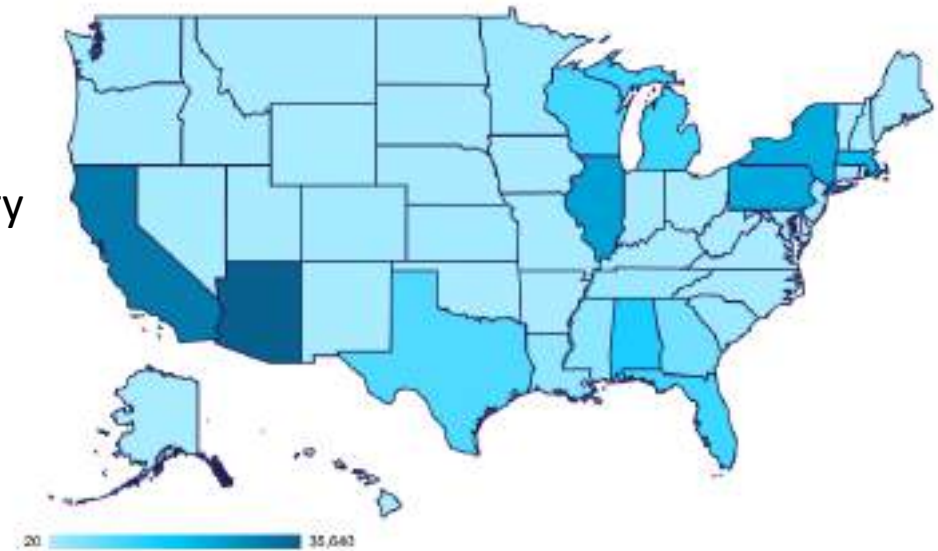


1,000,000 participants

- Electronic health record data
- Surveys
- Biospecimen for genomics and laboratory assessments
- Standardized physical measurements

Of 224,143 participants:

- 706 cases
- 166,599 controls



<https://www.researchallofus.org/data-snapshots/>

# Summary of Maine Chronic Kidney Disease (ME-CKD) Genetics Pilot Study

- Goal: Identify putative genetic loci that increase risk for CKD
  - Genome-Wide Association Study
- New collaborative clinical research project with Northern Light – Eastern Maine Medical Center
  - EMMC Clinical Research Center
  - Study protocol approved by EMMC IRB
  - Establishes BioBank for project at the University of Maine
- Access to All of Us Research Program established
- Help enable other clinical research collaborations

# Acknowledgements

## Northern Light Healthcare

Janet Baylaran, PhD  
Liz Carroll  
Clinical Research Center Staff  
Barbara Sorondo, MD  
Jim Jarvis, MD



## Steering Committee Members

Hermann Haller, MD, MDI Biological Laboratory  
Jens Reuter, MD, The Jackson Laboratory  
David Harder, PhD, University of Maine



## University of Maine and University of Maine System

Jason Charland, Office of Research Development  
Chris Boynton, Office of Research Administration  
Rachel Piper, University Services: Strategic Procurement



## Funding from the University of Maine System's Research Reinvestment Fund

# GSBSE Overview

- A unique collaborative graduate program comprising the five institutions which represent the biomedical research community within the State of Maine
- University of Maine is the degree granting institution
- Four private partnering institutions:
  - The Jackson Laboratory
  - MDI Biological Laboratory
  - Maine Medical Center Research Institute
  - The University of New England
- The largest Ph.D. program in the STEM area in Maine





# GSBSE Overview

- 2006 - Founded as the Graduate School of Biomedical Science (GSBS) as a result of a mandate by then Governor Baldacci in his January 2005 State of the State address to bolster research and education in biomedical science.
- 2012 - Graduate School of Biomedical Science (GSBS) became Graduate School of Biomedical Science & Engineering (GSBSE)

Institution	# Students	# Alumni	# Faculty
UMaine	26	25	66
JAX	6	16	39
MDIBL	3	4	14
MMCRI	10	15	23
UNE	6	4	23
External/Other	3	1	30
PSM	21	6	--
<b>Total</b>	<b>75</b>	<b>71</b>	<b>195</b>

## Current Degree Programs:

Ph.D. in Biomedical Science

Ph.D. in Biomedical Engineering

Professional Science Masters (PSM) in Bioinformatics





## Center for Community Inclusion and Disability Studies

*University Center for Excellence in Developmental Disabilities*

Four Core Functions:

- Research
- Education
- Service
- Dissemination

in Developmental Disabilities

# Developmental Disabilities Assistance and Bill of Rights Act of 2000 (“DD Act”)

- To assure the people with developmental disabilities and their families ***participate in the design of*** and ***have access to***:
    - needed community services, individualized supports, and other forms of assistance that promote:
      - ***self-determination***
      - ***independence***
      - ***productivity***, and
      - ***integration and inclusion in all facets of community life***
- through culturally competent programs.



John F. Kennedy

Rosemary Kennedy

The Kennedy Family at Hyannis Port, Massachusetts, 1931  
Photo by Richard Sears in John F. Kennedy Presidential Library and Museum, Boston

## Areas of Emphasis

- Quality Assurance
- ***Education and Early Intervention***
- ***Child Care***
- ***Health***
- ***Employment***
- Housing
- Transportation
- Recreation
- Other Services, Including Formal and Informal Community Supports, that Affect Quality of Life

# Community Advisory Committee



# NH-ME LEND: *Leadership Education in Neurodevelopmental and Related Disabilities*

Institute on Disability/UCED



Center for Community Inclusion  
and Disability Studies

*University Center for Excellence in Developmental Disabilities*



# Supporting Children of the Opioid Epidemic

- Build nationwide provider capacity in applying evidence-based practices in screening, monitoring, and supporting children diagnosed with NAS, NOWS, or suspected of being impacted by opioid use, trauma, or related exposure
- Telepractice model: Extension for Community Health Outcomes (ECHO™)





# Afari™



[ccids.umaine.edu/research-projects/afari](https://ccids.umaine.edu/research-projects/afari)

**COOPER  
HEWITT** **ACCESS+ABILITY**



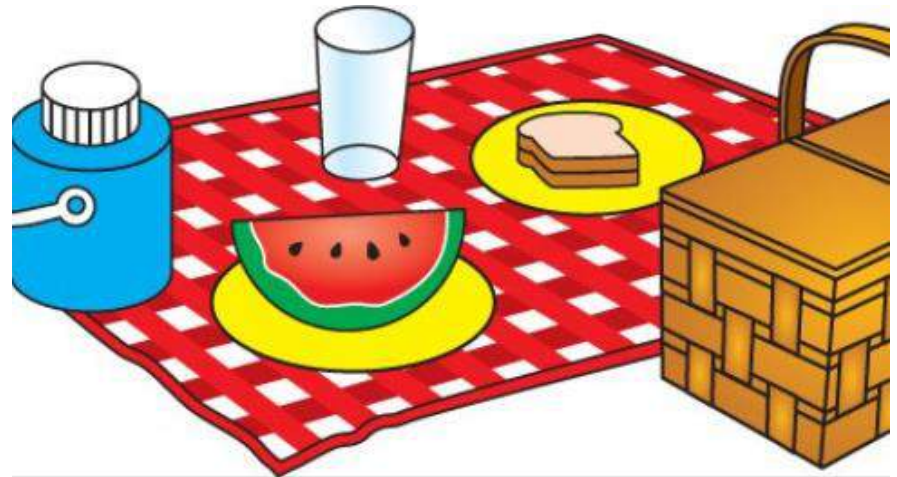
Lent by Mobility Technologies  
Mobility Aid, AFARI, 2010-14  
Author: Cooper Hewitt, Smithsonian Design Museum  
<https://collection.cooperhewitt.org/objects/1158847061>

## Some Other CCIDS Activities

- Undergraduate minor in Disability Studies
- Graduate Certificate
- Research, Evaluation, and Technical Assistance on Child Care and Education of Children with Disabilities
- and much more

## Covid-19 Activities

- ***“Social Undistancing” Project***
- Disparities in Covid Impact
- Equitable Access to Treatment and Access to Supports



AUG  
15

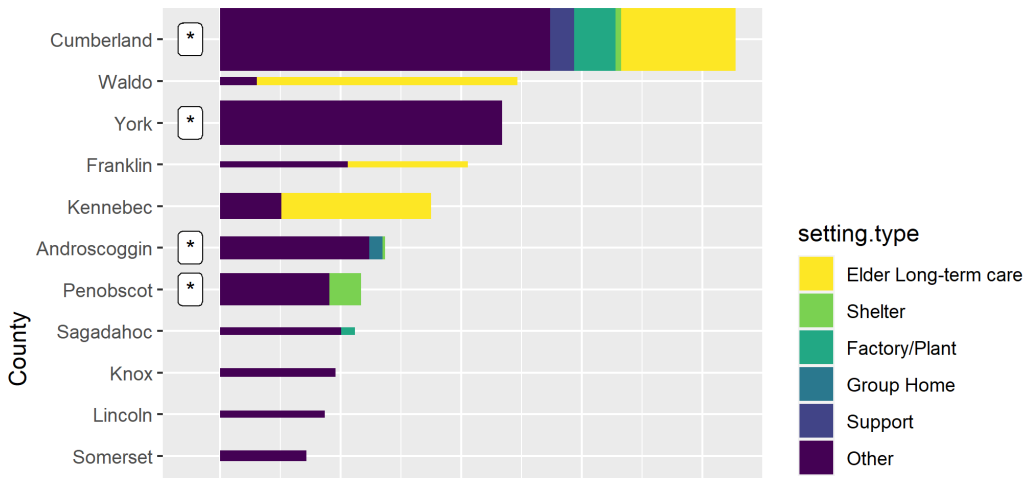
### Virtual Picnic

Public - Hosted by **University of Maine Center for Community Inclusion and Disability Studies** and **Cindy Thielen**

# Covid-19 Activities

- “Social Undistancing” Project
- **Disparities in Covid Impact**
- Equitable Access to Treatment and Access to Supports

Maine Covid-19 Cases per Capita through 2020-05-07 by County and Setting Type  
 Asterisks indicate counties with community transmission.  
 Bar widths are proportional to county population.



## Covid-19 Activities

- “Social Undistancing” Project
- Disparities in Covid Impact
- ***Equitable Access to Treatment and Access to Supports***

### HHS Office for Civil Rights in Action



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March 28, 2020

BULLETIN: Civil Rights, HIPAA, and the Coronavirus Disease 2019  
(COVID-19)



**AUCD: Growing Leaders, Driving Change**



Association of University Centers on Disability  
<https://www.youtube.com/watch?v=EG5u8ybB92o>



# Center on Aging

**UMaine Institute of  
Medicine Webinar –  
Impact Week**

**September 29, 2020**

Lenard W. Kaye, DSW, PhD  
Professor and Director

# Center on Aging Overview

- **Established in 2001**
- **The only unit of UMS devoted exclusively to issues of aging and the aging process**
- **An interdisciplinary research center within the University of Maine**
- **Thematic areas of emphasis**
  - Rural aging
  - Aging and thriving in place
  - Engaged/Productive aging
- **Three focal areas:**
  - Research and Evaluation
  - Education and Training
  - Service/Technical Consultation



# Students Have Played an Enormous Role From Day 1



MSW students assist with the annual  
University of Maine Clinical Geriatrics Colloquium



Student volunteers  
assist with cataloguing  
expired prescription  
drugs being prepared for  
disposal as part of the  
Safe Medicine Return  
for ME program



Specialized training in geriatrics and  
gerontology for the next generation of  
health and human service professionals



# Health Promoting Community Service Programming



Helping older adults age-in-place with high quality of life



**SENIOR CORPS**

Corporation for NATIONAL & COMMUNITY SERVICE



Learning for the fun of it



MAINE **RSVP**  
Recreational Service Volunteer Program

**BONE BUILDERS**  
Be a participant or become a leader!  
An 8-Weekend Recreational Program - All Levels and Paces



UMaine Center on Aging logo and Senior Corps logo.



Placing volunteers in service to our communities



**GATEWAY SENIORS**  
*without walls*

IN AFFILIATION WITH



# Education and Training

- Interprofessional **Graduate Certificate** in Gerontology
- Annual **Clinical Geriatrics Colloquium**
- **Health Connection Chats** helping Mainers stay safe, well, and connected during the pandemic
- **AgingME** Geriatrics Workforce Enhancement Program



# Research on Topics Relevant to Life Span Health Issues

- Screening for **Elder Abuse** (Maine Health Access Foundation)
- Assessing Geriatric **Mental Health** Issues (Maine DHHS)
- Disposing **Prescription Drugs** Safely (U.S. EPA and Maine Drug Enforcement)
- Preventing Older Adult **Falls** (NIH/NIA)
- Treating **Alcohol and Substance Abuse** (ME Substance Abuse and U.S. Children's Bureau, DHHS)
- Strengthening Family **Caregiver Supports** (Weinberg Foundation)
- **Osteoporosis** Education for Post-Menopausal Women (U.S. Administration on Aging, DHHS)
- Expanding Older Adult **Medical Transportation** Services (EMHS)
- Developing **Adult Day Care** Services (Maine Health Access Foundation)
- Improving **Oral Health** in Long-Term Care (Lunder-Dineen Health Alliance)

Access to older citizen scientists through our community service programs and our Maine Older Adult Research Subject Registry

## Collaboration is Key

Every single initiative at CoA requires extensive and genuine collaborations with community businesses, foundations, public agencies, non-profit organizations, and older adults themselves

- Maine Professional Associations (Pharmacists, Physicians)
- USM/UNE
- Community Health Networks & Coalitions
- Medical Centers/FQHCs
- Community Action Programs/Area Agencies on Aging

# Just a Few of the Partnerships Over the Years

