

NCI Early-Onset Cancer Initiative

LeeAnn Bailey, MD, PhD

17th Joint Board of Scientific Advisors/National Cancer Advisory Board Meeting

Early-onset Cancer Initiative

1. *The Challenge*
2. *PROSPECT*
3. *Approach*
4. *Discussion*

The Challenge

- Global incidence of early-onset cancer (EOC) increased by 79.1% between 1990 and 2019
- Global mortality rates of EOC increased by 27.7% between 1990 and 2019
- Recent data shows association with rise in EOC incidence rates and specific risk factors; however, little is known holistically
- We need to accelerate the pace of discovery to complement longitudinal cohort studies.



CANCER
GRAND
CHALLENGES



Team:
PROSPECT

**Team PROSPECT:
Pathways, risk factors, and
molecules to prevent early-
onset colorectal tumors**

Yin Cao, ScD, MPH, co-Team Lead

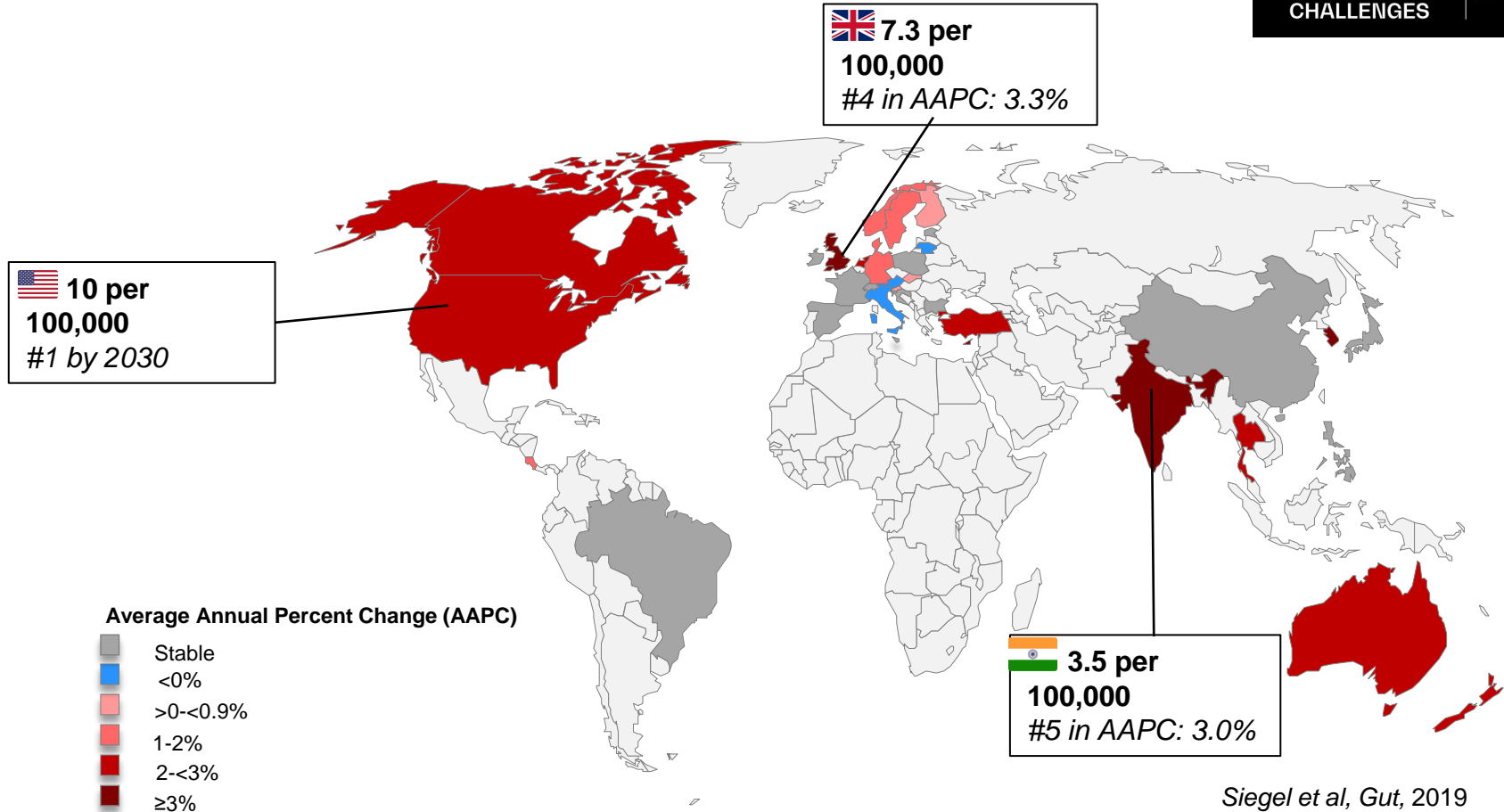
Washington University in St. Louis

NCI BSA/NCAB, Dec 3rd, 2024

Funded by



RATIONAL FOR EARLY-ONSET CRC (EOCRC) FOCUS: GLOBAL IMPACT



Siegel et al, *Gut*, 2019

Cancer Grand Challenges Team PROSPECT (2024-2029)

Pathways, Risk factors, and mOleculeS to Prevent Early-onset Colorectal Tumors

Vision


To unravel and ultimately reverse the network of **causal** factors throughout the life course that promote colorectal cancer among individuals < 50 years old




Mission

To advance **correlation to causation** for **actionable prevention** among younger generations

PROSPECT'S MULTI-DISCIPLINARY TEAM

Yin Cao, ScD, MPH (co-Lead)
Cancer epidemiology
 WashU



Andrew Chan, MD, MPH (co-Lead)
Gastroenterologist; Cancer prevention
 MGH



Gary Patti, PhD
Exposomics/Metabolism
 WashU



Tim Spector, MD
Clinician; Genetic epidemiology; precision nutrition
King's College London 



Nicola Segata, PhD
Computational biology
  U Trento




**~30 collaborators
(32% early stage)
~30 future leaders
~15 cohorts/biobanks**

Bhawna Sirohi, MBBS, FRCP
Medical oncologist; Global oncology
BALCO Medical Centre 




Emily Balskus, PhD
Chemical biology
 HHMI, Harvard



Ömer Yilmaz, MD, PhD
Pathologist; Stem cell biology
MIT 



Jason Buenrostro, PhD
Cellular & molecular biology
 Harvard

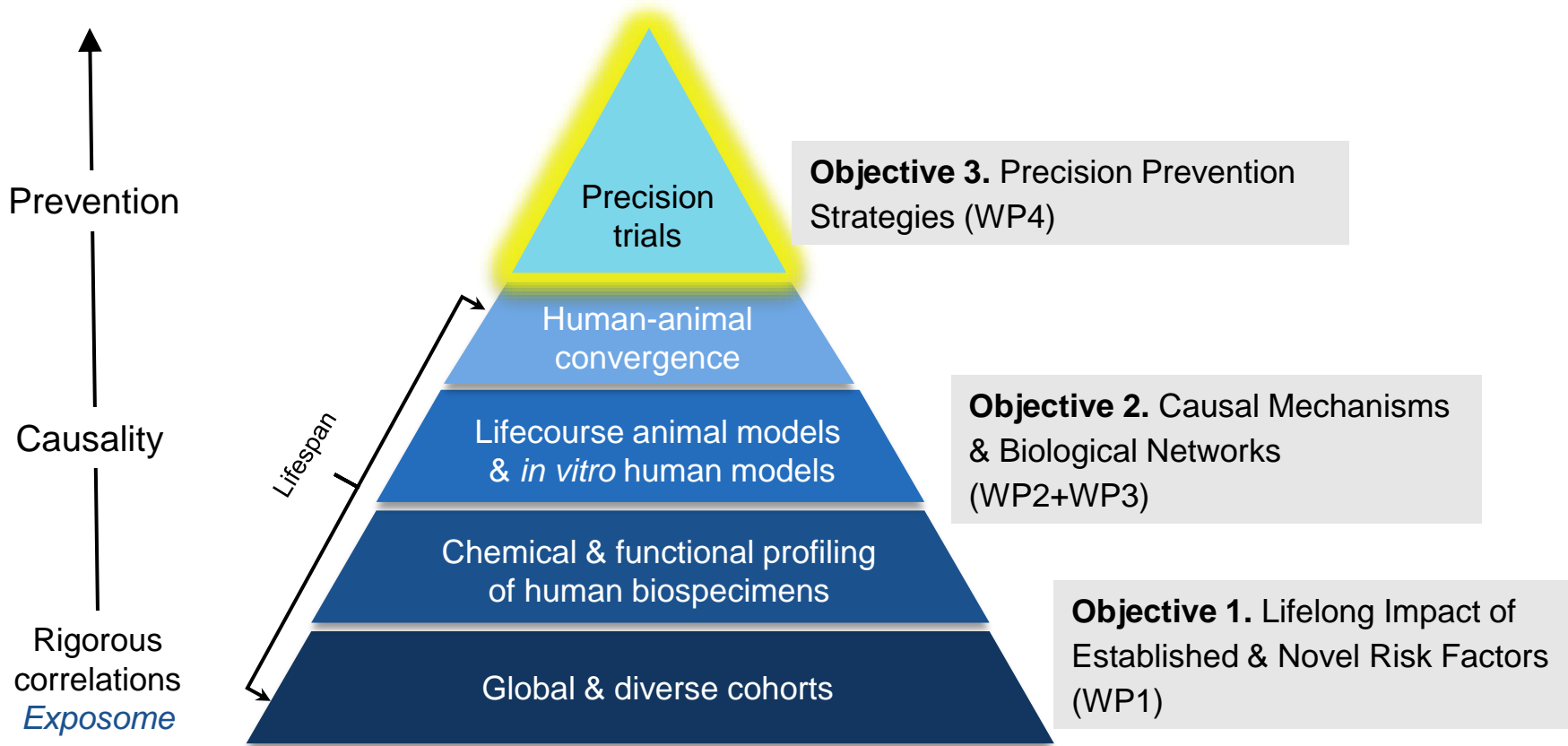


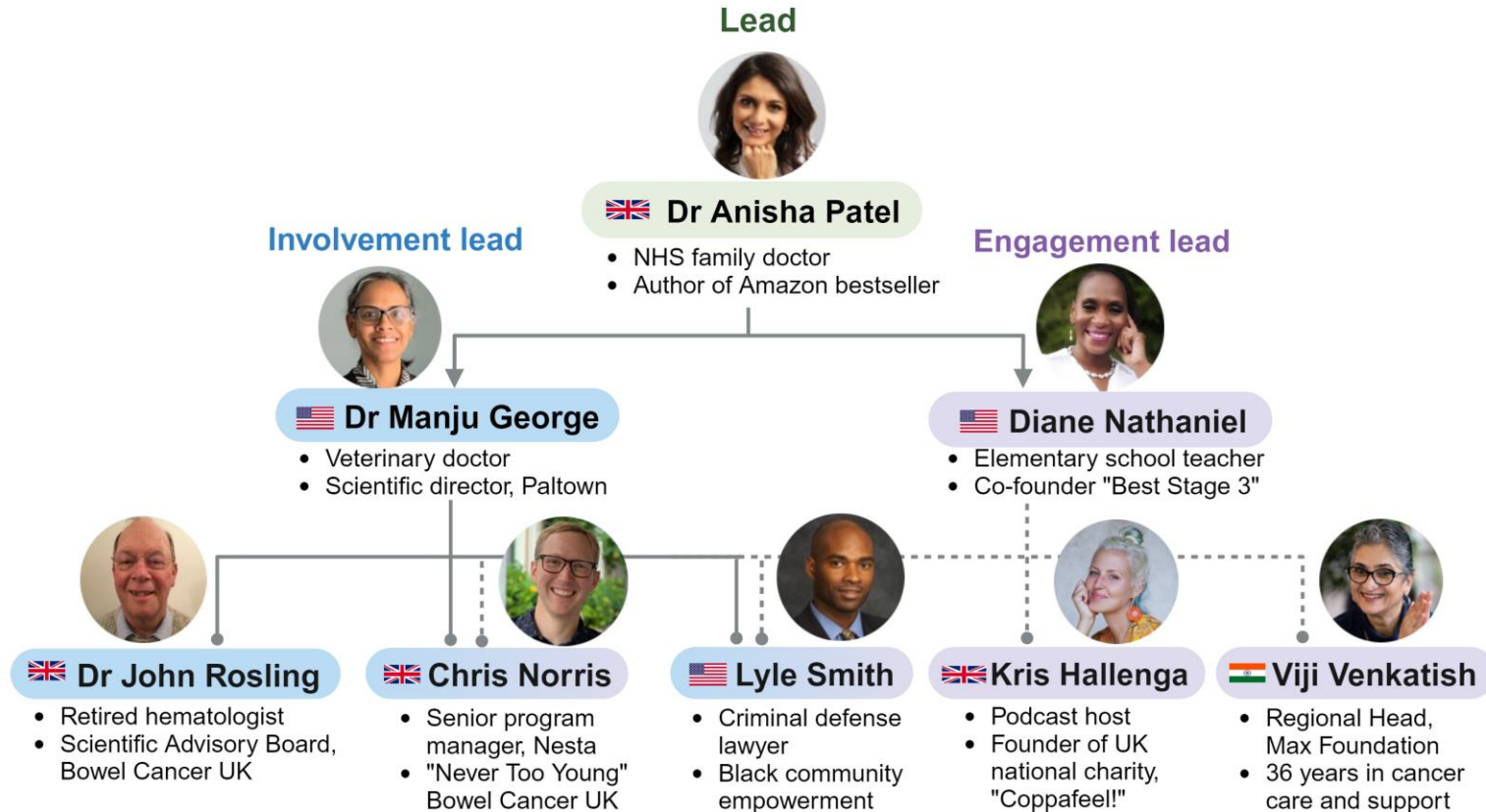
Curtis Huttenhower, PhD
Computational biology
Broad Institute 



Yasmine Belkaid, PhD
Immunology
Institut Pasteur 









In 5 years, PROSPECT aims to:



Innovate

Advance understanding of EOCRC etiology
Develop novel, feasible approaches for EOCRC prevention



Interact

Foster global collaborations across disciplines & communities



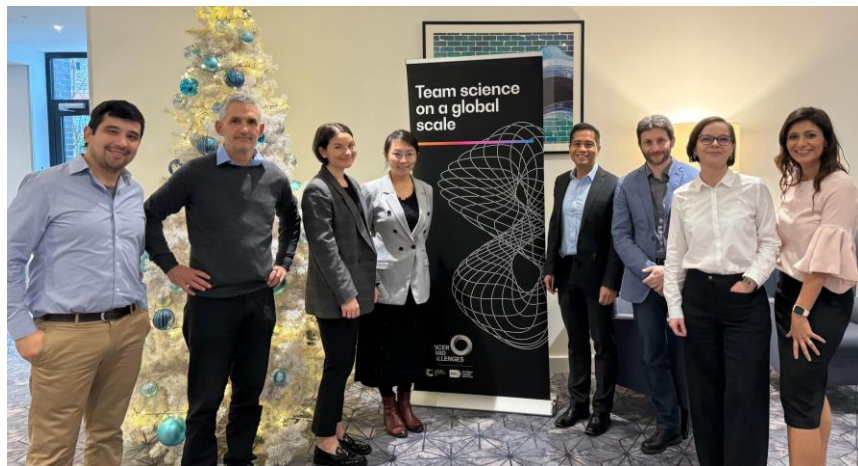
Illuminate

Share our challenges to support innovative solutions for other early-onset cancers



Inspire

Prepare future leaders for team science initiatives to take lead on greater challenges



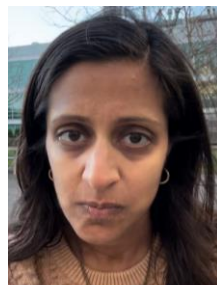
Yin Cao, Washington University in St. Louis
Email: yin.cao@wustl.edu; X: @yincaoScD

Listening to the Early-Onset Community



Patient

"I went overnight from envisioning and planning my wedding to envisioning and planning my funeral."



Provider

"The biggest issue keeping me up at night in terms of what I'm seeing at the clinic is the tremendous number of young patients."



Caregiver

"My wife was diagnosed with Stage 4 colorectal cancer January of 2023. That was four months after she ran a half marathon and years before any doctor would tell her to get screened."



Patient

"At 43 years old I was diagnosed with Stage 4 colorectal cancer,"

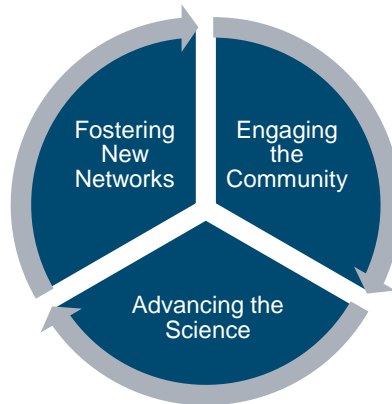
Proposed Approach

- Goal: Reduce EOC incidence and improve survivorship
- Approach: Use a collective, multidisciplinary approach to better understand the interplay and causal factors involved in EOC
- Potential Activities: Scientific workshops, listening sessions, publications

WHY



HOW



NCI-funded EOC Efforts

NOTICE OF SPECIAL INTEREST:
Research on the Etiology, Early Detection, Screening and Prevention of Early-Onset Colorectal Cancer

APPLY NOW

 NATIONAL CANCER INSTITUTE
Division of Cancer Prevention

 **JOURNAL of the NATIONAL CANCER INSTITUTE**

JOURNAL ARTICLE CORRECTED PROOF

Genetic risk, health-associated lifestyle, and risk of early-onset total cancer and breast cancer 


Yin Zhang, MD, MPH, Sara Lindström, PhD, Peter Kraft, PhD, Yuxi Liu, PhD, MS 

JAMA Network

JAMA Oncology Search All Enter Search Term

This Issue Views 12,444 Citations 68 Altmetric 60

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Original Investigation 

May 2015

Germline *TP53* Mutations in Patients With Early-Onset Colorectal Cancer in the Colon Cancer Family Registry

Journal of Psychosocial Oncology > Volume 36, 2018 - Issue 4

Submit an article Journal homepage

692 Views

1 CrossRef citations to date

6 Altmetric

Article

Obesity, physical activity, and dietary behaviors in an ethnically-diverse sample of cancer survivors with early onset disease

Beth A. Glenn , Ann S. Hamilton, Narissa J. Nonzee, Annette E. Maxwell, Catherine M. Cres

Pages 418-436 | Published online: 15 May 2018

 **NATIONAL CANCER INSTITUTE**
Division of Cancer Control & Population Sciences

NIH Early-Onset Colorectal Cancer (EO-CRC) Think Tank

Supported by
National Cancer Institute (NCI) & National Institute of Environmental Health Sciences (NIEHS)

September 24–25, 2020

SEP 13 2021

Early-onset Colorectal Cancer: What Do We Know and Where Do We Go?

 Peter Campbell, PhD, MSc
Professor
Albert Einstein College of Medicine

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Associate Professor of Surgery
Washington University in St. Louis

Moderators:

 [Jessica Petrick, PhD, MPH](#)
Epidemiologist, Slone
Epidemiology Center
Assistant Professor of Medicine,
Boston University School of
Medicine

 [Neil Murphy, PhD](#)
Epidemiologist, Section of
Nutrition and Metabolism,
International Agency for Research
on Cancer (IARC), Lyon, France

Key Research Priorities



Rising Cancer Incidence at Younger Ages



Emerging Exposures and Risk Factors



Novel Detection Strategies



Tumor Biology



Disparities (Diverse & Special Populations)

Centering Patients: Additional Priority Areas



Quality of Life

- Survivorship
- Fertility
- Financial independence
- Mental health

Communication

- Accessible
- Shareable
- Collaborative
- Transitions in care/caregivers

Outreach

- Culturally tailored
- Meaningful engagement
- Building trust

Fostering New Networks

NCI Working Groups

- Leveraging expertise across NCI

Collaboration

- Working with extramural investigators and community partners
- Workshops on key areas

Data Analysis & Sharing

National Cancer Plan framework

- A call to action for *everyone* to do their part in ending cancer as we know it



Questions and Discussion



What are the scientific opportunities in early onset cancer research?



Who should be at the table?
Who should we engage?



How can we utilize existing networks? What can we leverage now?

Thank You



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