

National Cancer Advisory Board

Division of Cancer Epidemiology and Genetics

Overview

Stephen J. Chanock, M.D.

December 10, 2013

Background

- **Came to NIH in 1958**

- Building 7

- **Undergraduate degree in music**

- Composition

- **Studied conducting/composition in UK**

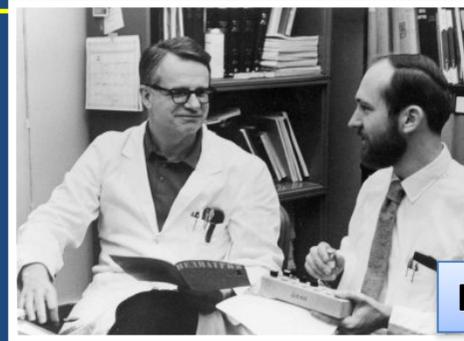
- **Harvard Medical School**

- **Two pediatric subspecialties**

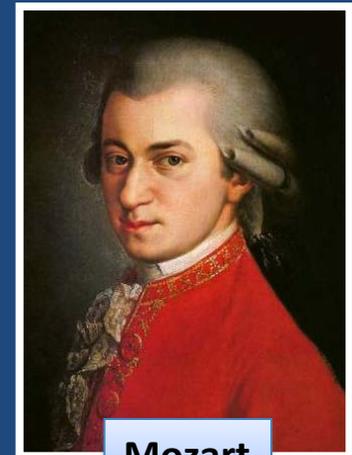
- Infectious Diseases
- Hematology/Oncology

- **Laboratory Fellowship in Molecular Hematology**

- Dr. Stuart H. Orkin (HHMI / Boston Children's Hospital)



Drs. Chanock and Purcell



Mozart

Career at NCI

- **1991 - Joined Pediatric Oncology Branch**
 - Infectious complications of pediatric cancer and HIV infections
 - Molecular biology of immunosuppression
- **1996 - First DCEG collaborations**
- **1991-2007** **CCR PI**
- **2001-Today** **Director of CGR**
- **2007-2013** **Chief of LTG**
- **2012-2013** **Acting Co-Director of CCG**

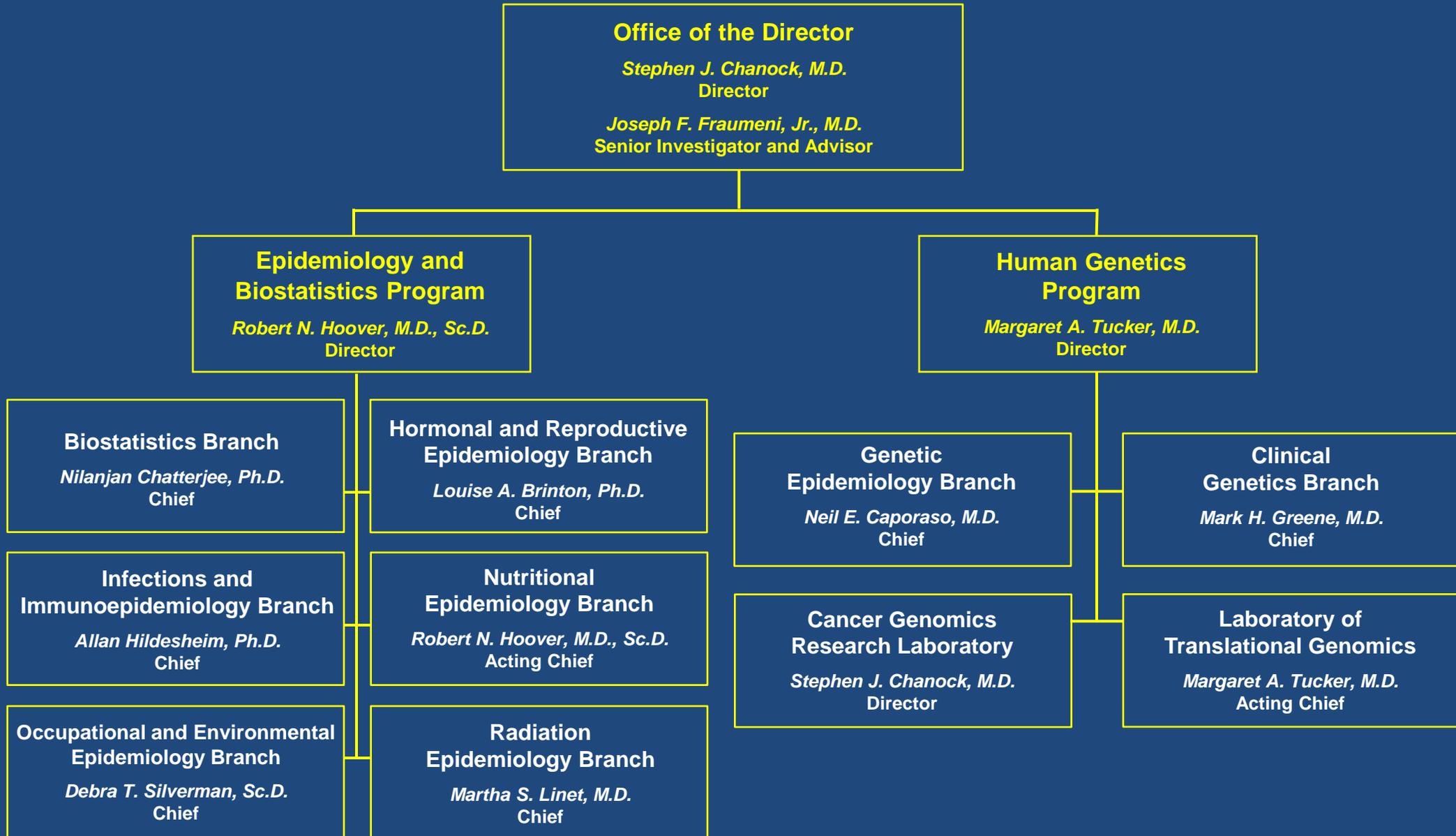


DCEG Mission

- **To uncover the causes of cancer and the means of its prevention through broad-based, high-quality, high-impact research**
 - **Classical epidemiology**
 - **Molecular epidemiology**

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DCEG Today

• Intellectual

• Research

• Immune system decisions for

Selected Publications



- 14 PLoS One/Genetics/Medicine
- 5 N Engl J Med
- 11 JNCI
- 6 Nature Genetics
- 6 JCO
- 2 JAMA/JAMA Archives
- 2 Lancet/Lancet Oncology

Key Issues

- **Use emerging technologies** to improve exposure assessment
- **Develop analytic/informatic capacity** to match scientific goals

Exploring New Technologies

- **Evaluate feasibility of new technologies as applied to population sciences**
 - **Epigenomics**
 - **Microbiomics**
 - **Metabolomics**
 - **Proteomics**

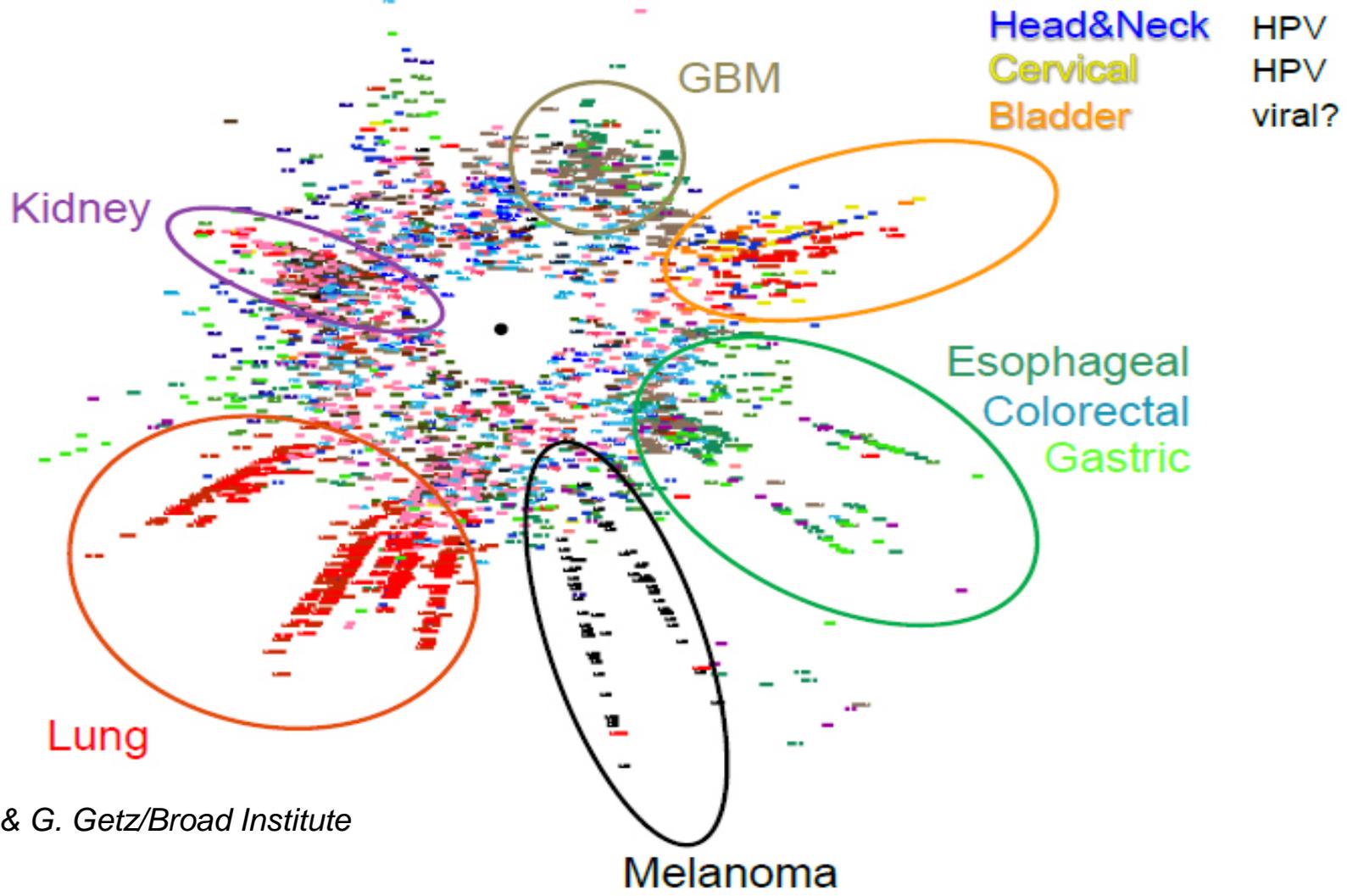
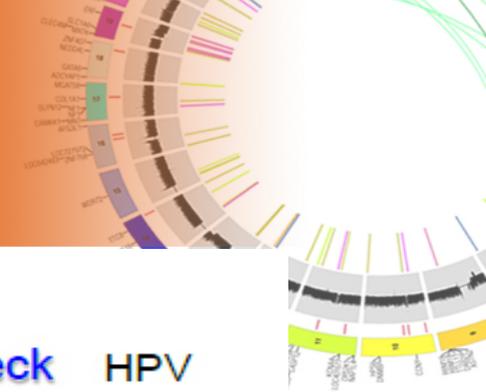
Strategic Initiatives in Germline Genomics

- **Susceptibility**
 - Discovery
 - Comprehensive maps of cancer-specific genetic architecture
- **Focus on highly informative cases**
 - Familial Cancers
 - Pediatric cancers
 - TARGET germline initiative
 - Second Cancers
 - Childhood Cancer Survivor Study
- **Laboratory investigation of mechanistic insights**
 - How does the germline inform somatic alterations?

Strategic Initiatives in Genomics

- **Somatic Molecular Epidemiology**
 - Investigate interaction between exposures, germline and somatic profiles in high-quality studies
 - EAGLE- lung cancer
 - Chernobyl radiation-induced thyroid cancer
 - Close partnership with Center for Cancer Genomics
 - TCGA-related projects
 - PanCan analysis

TCGA: Lessons Learned from the Data

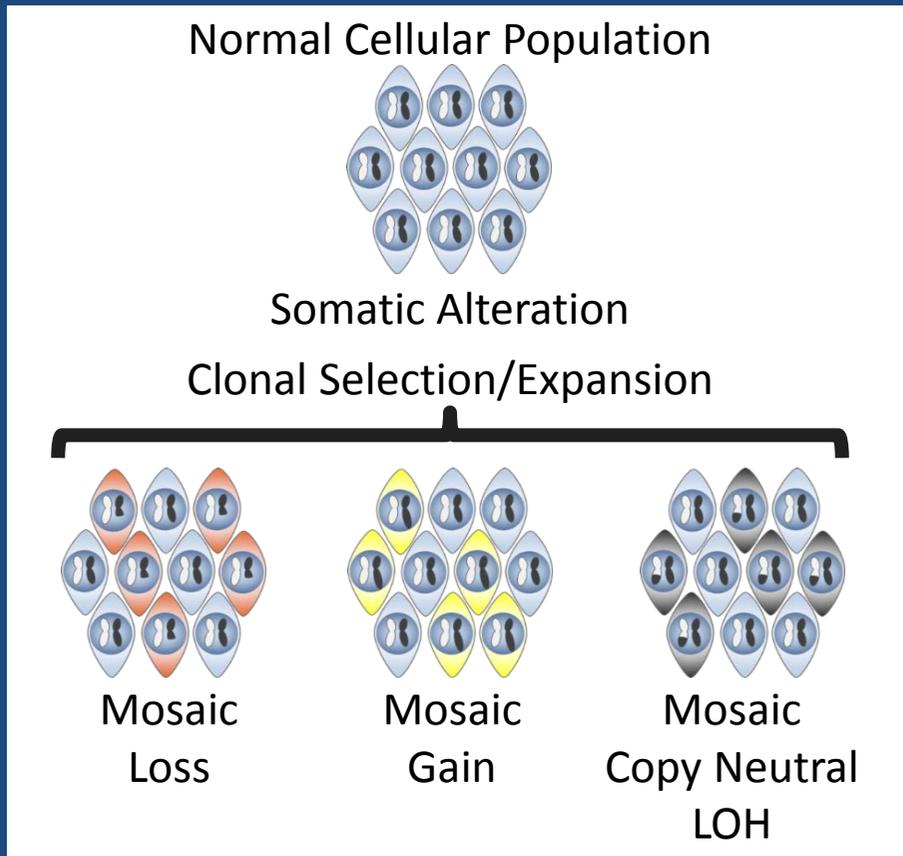


M. Lawrence & G. Getz/Broad Institute

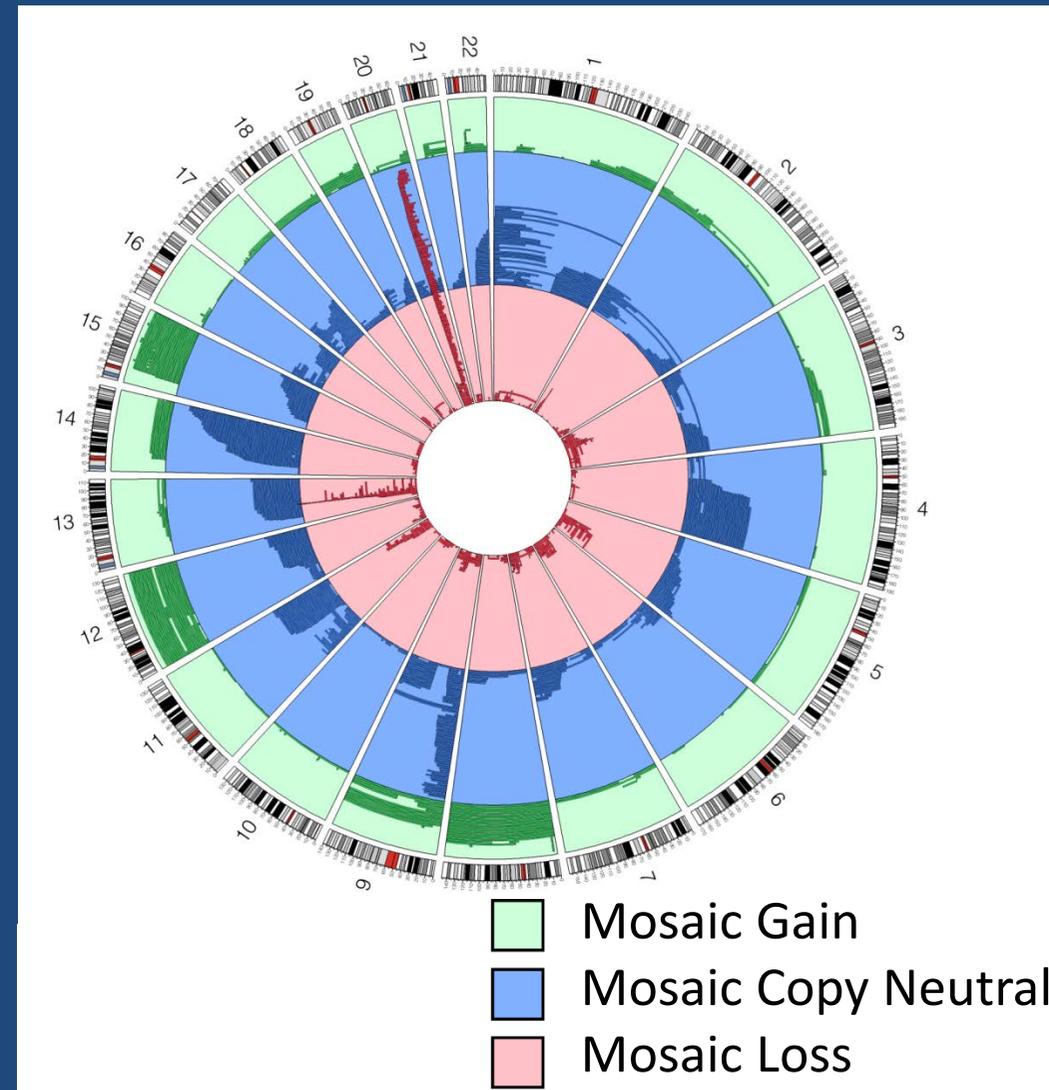
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- **Risk Assessment and Modeling**

Detectable Clonal Mosaicism in 'Germline' Unexpected Finding in GWAS



- Breadth of mosaicism
- Risk factor for cancer?
- Insights into 'genomic stability'





Leverage Areas of Special Expertise

- **Environmental and Occupational Exposures**
 - Ultrafine particulates and lung cancer
 - Pesticides and cancer
 - Systematically characterize mechanisms of action of leukemogens and lymphomagens
 - Benzene
 - Formaldehyde
 - Trichloroethylene
 - Perchloroethylene

Leverage Areas of Special Expertise

- **Radiation Exposure**

- **Environmental**

- Risk assessment in Chernobyl and atomic bomb survivors
 - Genomic characterization of radiation-induced thyroid cancer

- **Medical and Occupational**

- CT scans
 - Healthcare workers
 - Nuclear medicine
 - Angiography

Emerging Opportunities

- **Develop New Strategic Studies**
 - **Energy balance and obesity**
 - Physical activity
 - **HPV vaccine**
 - Optimal dose efficacy (< 3)
 - **Second cancers**
 - Childhood Cancer Survivors Study

Emerging Opportunities

- **Launch new long-term prospective cohort study**
 - Serial biospecimens
 - Exposure assessments
- **Leveraging existing infrastructure**
 - HMOs
 - Military/VA
 - International partners

Management Style

- **Gather information before making decisions**
 - Ask many questions
 - Seek wise counsels
 - Listen to many perspectives
- **Present problems with possible solutions**
 - Consider alternative perspectives
- **Support the next generation**
 - Feature young investigators (TT/Fellows) in team science
- **Consider the past, but not be wedded to it**



“When you call me that, smile.....”

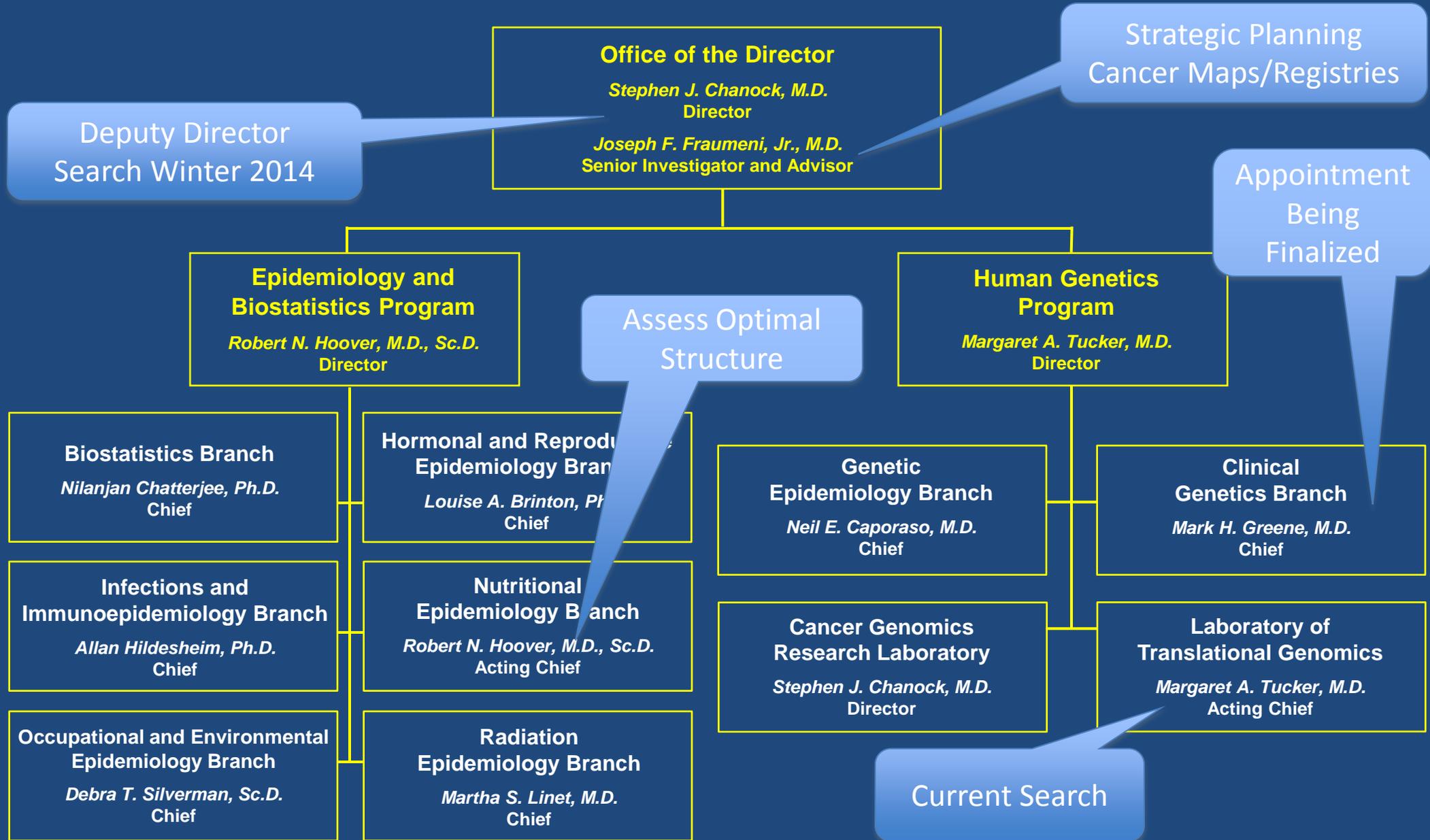
Mae West

Strategic Planning

- **Concise statements of**
 - Principal Investigators' scientific goals over 1, 3, 6 years
 - Staff Scientists/Clinicians' accomplishments and future directions
- **Value in assessing**
 - State of science across DCEG
 - Improvements for managing key resources
 - Promote new initiatives
 - Enhance collaboration

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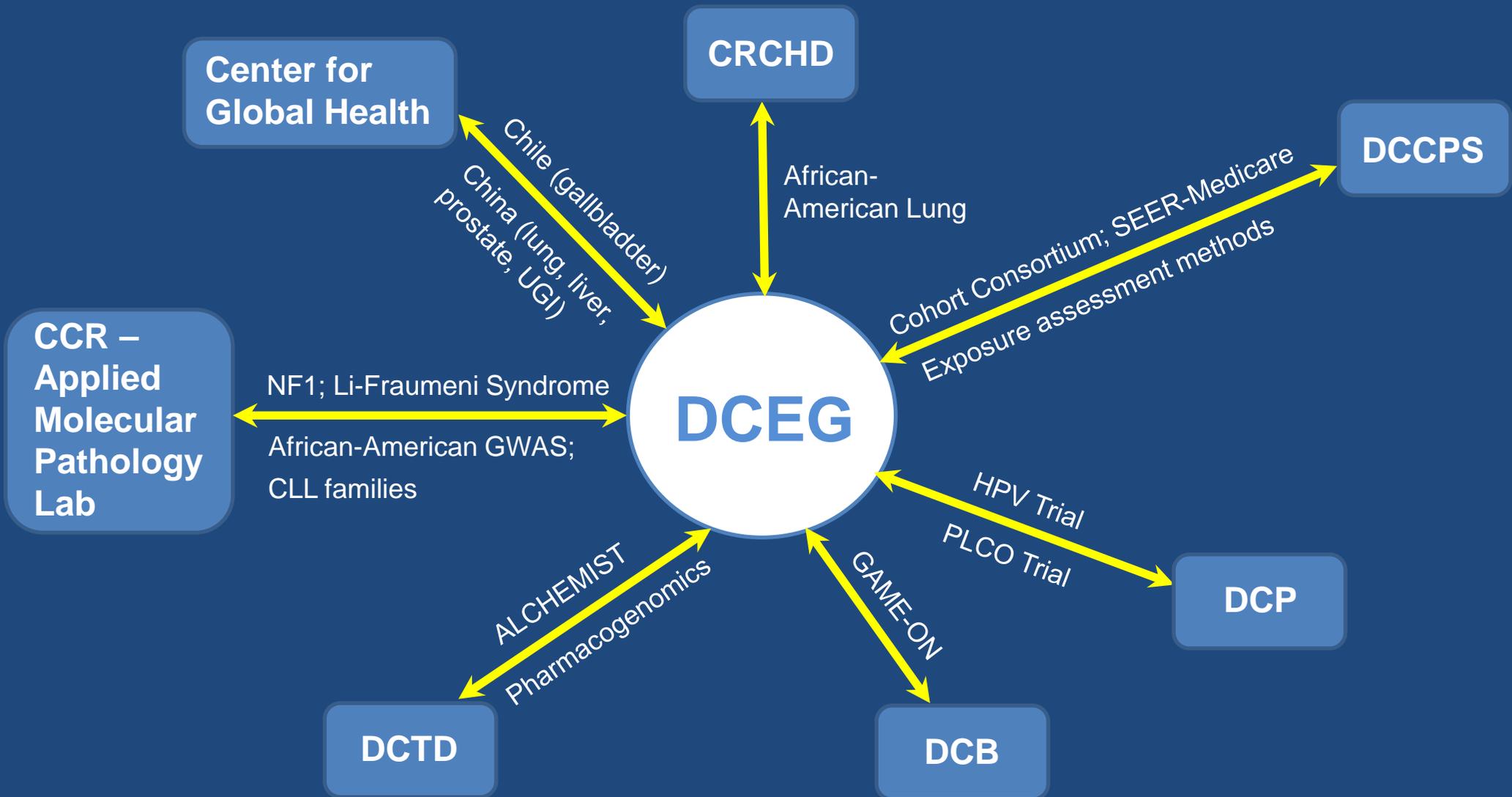
Division of Cancer Epidemiology and Genetics



Education & Training

- **Assess mentoring and recruiting**
- **Deepen connections across NCI Divisions**
- **Expand DCEG knowledge base**
 - **Furthering exposure to mechanistic insights**
 - **Modeling**
 - **Translating etiologic findings to public health**

Collaborations Across NCI



Senior Expert Lectures

- **‘State-of-the Art’ presentation of a discipline**
 - Feature some of their work
- **Experts in related cancer fields**
 - Oncogenes
 - Targeted Therapy
 - Immunology
- **Discuss synergies between their field and population sciences**
- *Important Metric: New Collaborations*

The Challenges Ahead

- **Retain academic excellence** in fiscally restricted times
- **Strengthen connections across DCEG**
 - Enhance collaborative network
 - Promote new initiatives
 - Translational Epidemiology
 - Unattended Opportunities
- **Upgrade informatic infrastructure**
- **Sunset studies past their prime**