The University of New Mexico Comprehensive Cancer Center

The Official Cancer Center of the State of New Mexico

Consortium Partners: Lovelace Respiratory Research Institute, Los Alamos National Laboratory, Sandia National Laboratories

Update to the State Legislature Tobacco Settlement Committee

September 5, 2017

Cheryl L. Willman, MD

The Maurice and Marguerite Liberman Distinguished Chair in Cancer Research
UNM Distinguished Professor of Pathology and Internal Medicine
Director and CEO, UNM Comprehensive Cancer Center

UNMCCC: Distinguishing Characteristics

1. Multiethnic, multicultural, and geographically dispersed populations with strikingly different patterns of cancer incidence, mortality, disparity
2. Statewide registries and networks to facilitate research in cancer control, cancer health disparities, and cancer care delivery

   New Mexico Tumor Registry
   NM HPV/PAP Screening Registry
   NM Colorectal Cancer Screening Registry
   Project ECHO

3. Integration of regional scientific and technologic strengths of consortium partners to create transdisciplinary research programs

   UNM, LRRI, LANL, SNL

4. Statewide cancer clinical trials, clinical research, and health services delivery network

   New Mexico Cancer Care Alliance

In 2015, the UNM Cancer Center Achieved Federal Designation as a National Cancer Institute Comprehensive Cancer Center

The UNM Comprehensive Cancer Center is One of Only 49 Cancer Centers in the Nation (Top 3%) to Achieve "Comprehensive" Status and Certification

UNMCCC Overall Goals

- To provide state of the art, comprehensive, integrated multi-specialty cancer diagnosis and treatment for all New Mexicans.
- To conduct outstanding laboratory, translational, clinical, and community research focused on discovering the causes and cures for cancer, particularly those cancers that disproportionately affect the minority and underserved populations of New Mexico, and, to translate our discoveries into more effective means to prevent, diagnose, and treat cancer.
- To reduce New Mexico's cancer burden by discovering the genetic, environmental, social, and behavioral factors that contribute to the distinct patterns of cancer incidence, mortality, and disparity in our populations
- To provide access to the newest cancer diagnostic, preventive agents, and treatments in a robust statewide cancer clinical trials program.
- To educate, train, and mentor cancer health professionals and scientists, with an emphasis on training under-represented minorities.
- To enhance economic development through science and discovery efforts.

A National Comprehensive Cancer Center:

1. Delivers the highest quality, integrated, cancer diagnosis and treatment by teams of cancer physicians (medical, surgical, gynecologic, pediatric, and radiation oncologists) who work together with nurses, pharmacists, and supportive care staff (nutrition, psychosocial support), to develop an individualized treatment plan for each of our patients.

At UNMCCC: New Mexico's largest team of cancer physicians, 125 cancer doctors in every cancer specialty recruited from the finest medical schools in the nation, provide care to >12,000 cancer patients each year from every county in New Mexico in more than 135,000 ambulatory clinic visits.

UNMCCC Clinical and Financial Metrics

Clinical Volumes:

FY17: 11,928 Patients / 135,000 Visits

FY18: 14,104 Patients / 148,500 Visits

FY17 (Las Cruces): 570 Pts / 5300 Visits

Patients Served:

Providing Care to 60% of NM Adults & 65% of Children Affected by Cancer

52%: Racial/Ethnic Minorities

Revenues:

FY17 Net Clinical: $81,573,322

FY18 Net Clinical: $92,969,745

FY17 Total (Excluding Research): $90,545,673

FY18 Total (Excluding Research): $103,558,262

Uncompensated Care:

FY17: $9,785,575

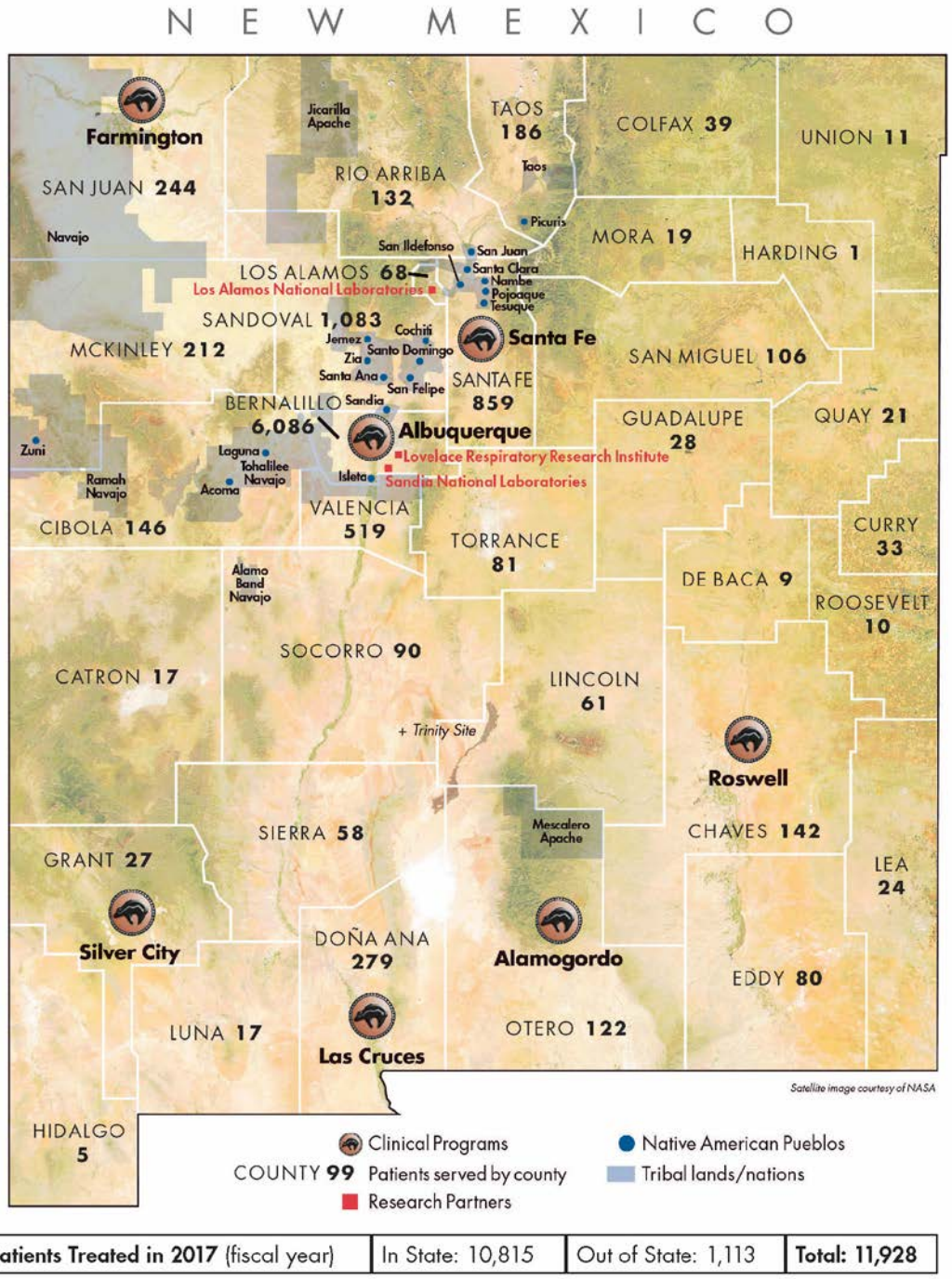
FY18: $11,232,413

Bernalillo County Support: $2 Million

Federal Grant Funding:

FY18: $64,974,222

FY18 State Support: $5,661,562



Patients Treated in 2017 (fiscal year)	In State: 10,815	Out of State: 1,113	Total: 11,928

A National Comprehensive Cancer Center:

2. Conducts world class cancer research, in our laboratories, clinics, and communities, to discover the causes and cures for cancers particularly affecting New Mexicans, to overcome New Mexico and the nation's cancer burden, and to promote economic development.

   At UNMCCC: Supported by $65 million annually in federal and private research funds, 128 scientists work with partners at LANL, SNL, LRRI, and State Universities to discover the causes and develop more effective cancer treatments.

   At UNMCCC: We have developed new diagnostics and drugs for leukemia, breast cancer, ovarian cancer, prostate cancer, liver and pancreatic cancer, brain cancer, and melanoma.

   At UNMCCC: Since 2010, UNM cancer scientists have been awarded >50 new patents, with 117 patents pending, and have started 13 new biotechnology companies.

A National Comprehensive Cancer Center:

3. Provides access to patients in its region to the newest and most effective cancer prevention and treatments in cancer clinical trials sponsored by the National Cancer Institute, Pharmaceutical Industry, and UNM Cancer Center.

At UNMCCC: Working with community health systems, we built the New Mexico Cancer Care Alliance, a statewide clinical trials network providing access to new cancer drugs and treatments in over 160 cancer clinical trials each year. The NCI deemed this an "exemplary national model for cancer health care delivery."

- *12% of UNMCCC patients enroll in therapeutic trials testing new cancer treatments*
- *35% of UNMCCC patients participate in various types of clinical research studies*

A National Comprehensive Cancer Center:

4. Educates, trains, and mentors the next generation of cancer physicians, scientists, nurses, pharmacists, and healthcare professionals to assure that New Mexico and the nation have a highly qualified healthcare workforce.

At UNMCCC: Since 2010, UNM has trained >350 cancer scientists (Masters, PhDs and fellows) and 190 cancer health care professionals (physicians, nurses, pharmacists).

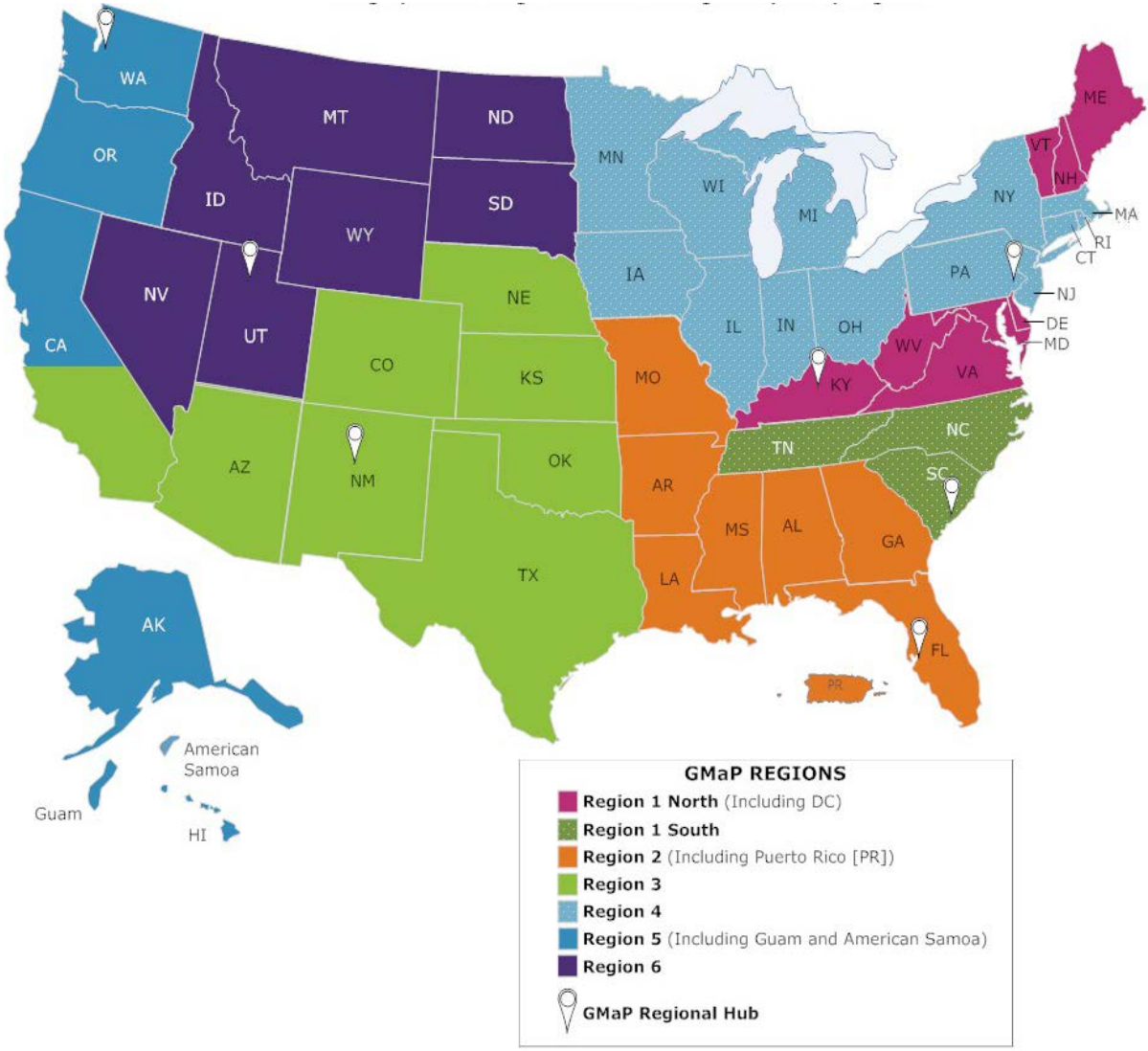
UNMCCC: NCI Geographic Management of Cancer Health Disparities Program (GMaP) Region 3 Hub

Andrew Sussman, PhD

Shiraz Mishra, PhD

Goals:

1. Advance the science of cancer health disparities
2. Management of cancer health disparities research, training, infrastructure, communication and dissemination
   - Enhance access to under represented investigators, trainees/students, and foster career development
   - Strengthen region-based community education and outreach efforts that contribute to achieving GMaP goals.
3. Achieve measurable reductions in cancer health disparities in these regions.



UNM COMPREHENSIVE CANCER CENTER

2020 STRATEGIC PLAN

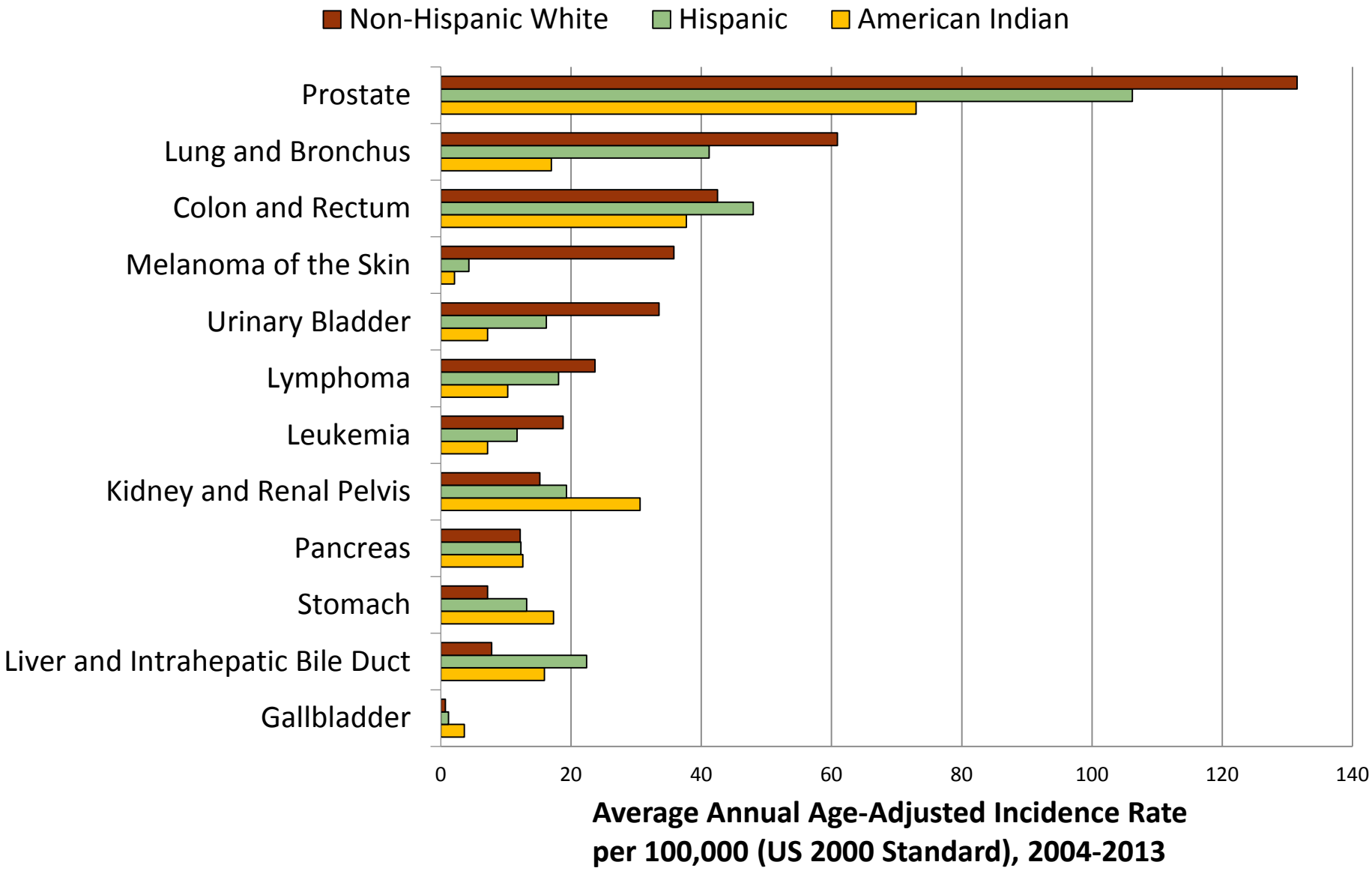
- CLINICAL FACILITY EXPANSION
- NEW CANCER CLINICAL SERVICE LINES
- RESEARCH STRATEGY

UNM COMPREHENSIVE CANCER CENTER

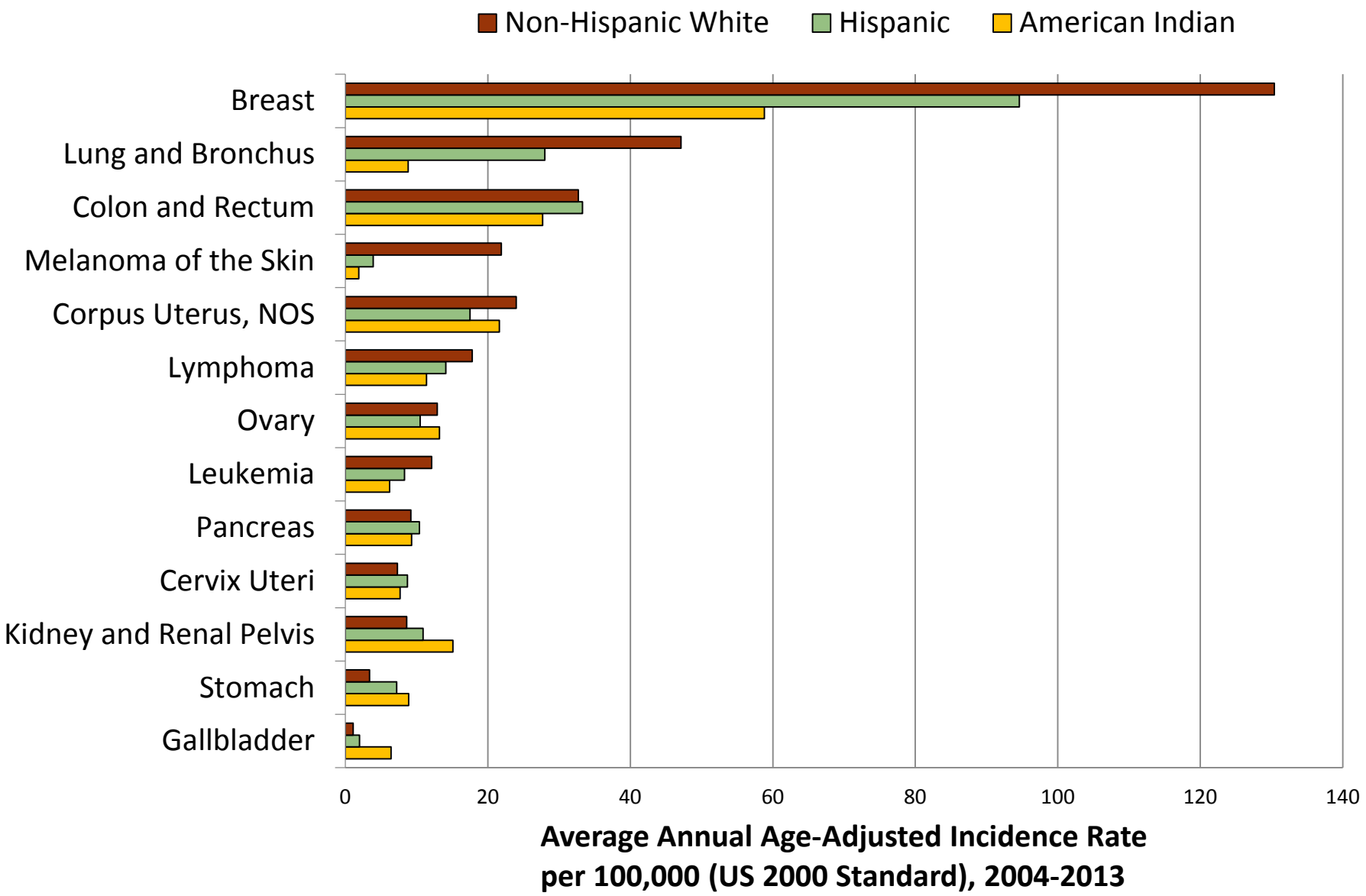
DELIVERING NEW CANCER TREATMENTS

- PRECISION ONCOLOGY
- GENOMIC SEQUENCING OF HUMAN CANCERS
- NEW THERAPIES TARGETED TO SPECIFIC GENOME MUTATIONS
- IMMUNOTHERAPY

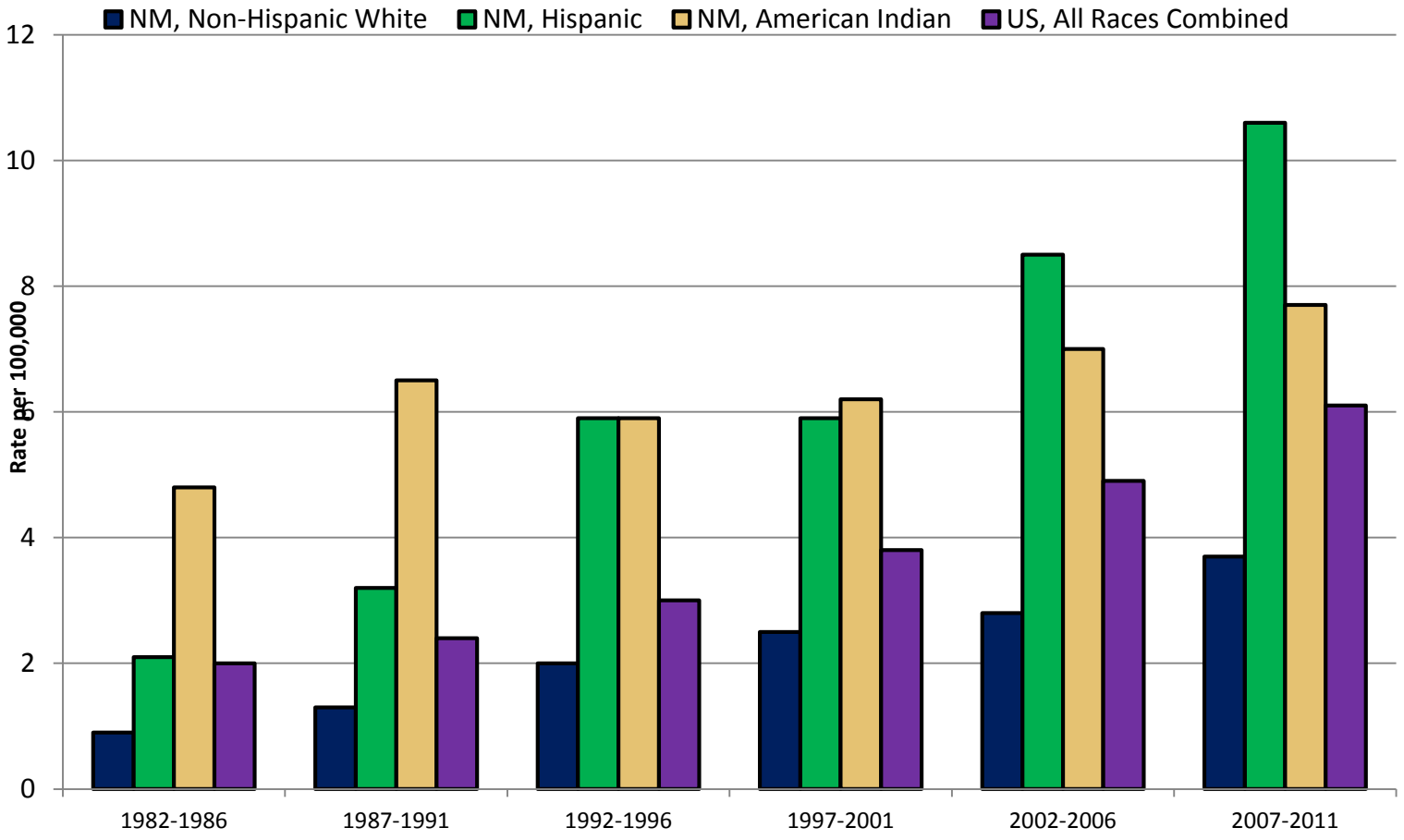
Cancer Incidence - New Mexico Males (2004-2013)



Cancer Incidence - New Mexico Females (2004-2013)



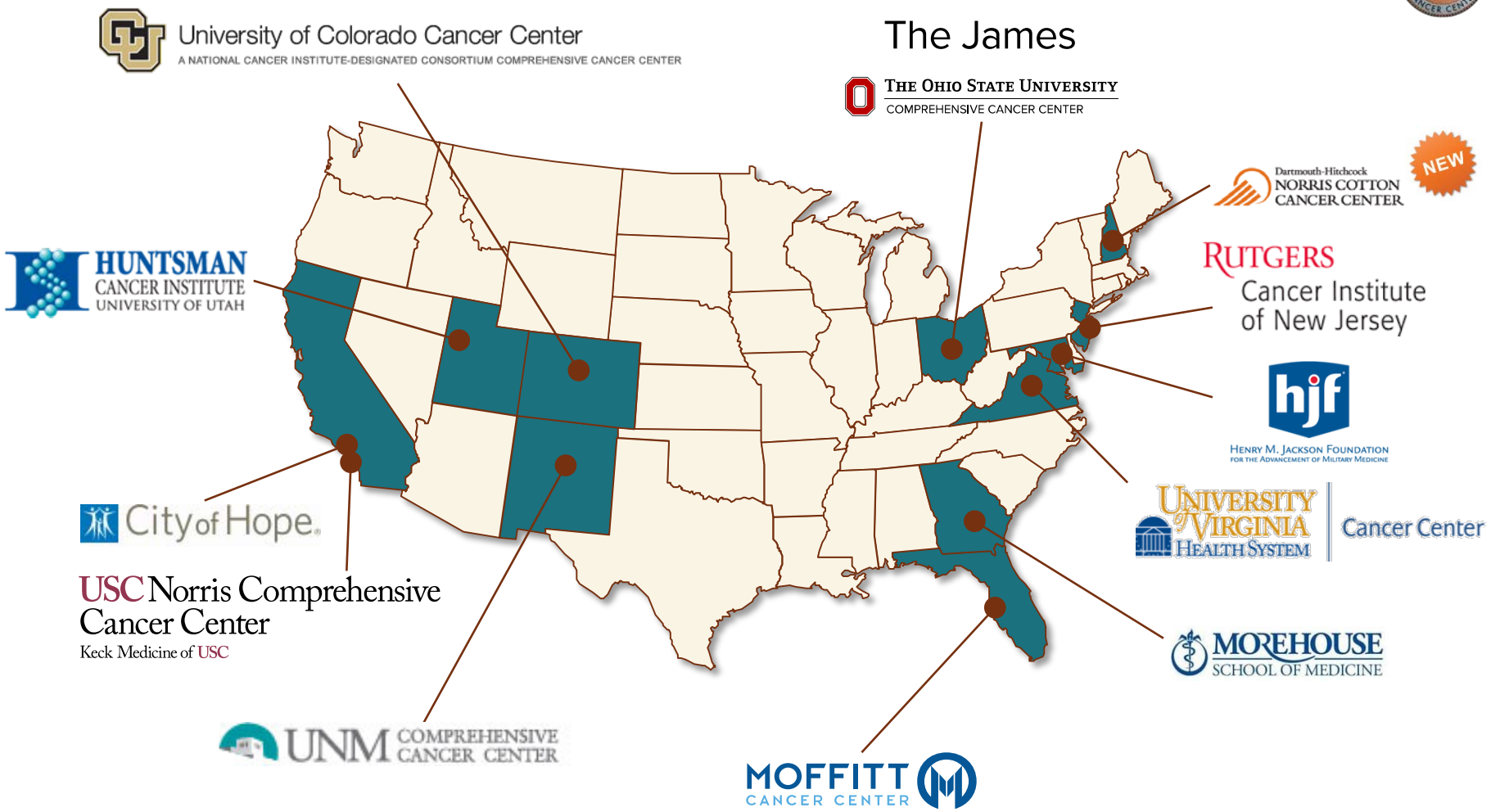
Liver and Hepatobiliary Cancers



UNMCCC Strategic Research Initiatives: 2020

1. Develop prospective ***New Mexico Cancer Patient Cohorts*** followed from diagnosis through survivorship or end of life with extensive tissue sampling (diagnosis, recurrence) and annotated epidemiologic and clinical outcome data as a member of the ORIEN National Precision Medicine Consortium
   - *NM Epidemiologic Cohort Focused on Cancers That Have Significant Disparities in NM (Gastro-intestinal, Hepatobiliary, Pancreatic, Ovarian, GU (Kidney, Bladder, Prostate))*
2. Develop formal research collaborative for the New Mexico American Indian Cancer Genome Project with NM DOH and Pueblo Nations to cooperatively develop and direct appropriate community-based cancer control interventions, precision medicine/genomic sequencing, and clinical trials.

ORIEN National Precision Medicine Network
16 NCI Centers / VA Health System / Walter Reed



New Members: Emory, U of Iowa, U Oklahoma, U Alabama Birmingham, U Oklahoma

UNMCCC Strategic Research Initiatives: 2020

3. Determine the impact of environmental exposures (arsenic, uranium, heavy metals, indigenous carcinogens) on cancer causation in NM communities and derive genome-wide mutational signatures reflective of these exposures.
   - *UNMCCC; SOM: Medicine, MGM; College of Pharmacy; Los Alamos National Laboratory; All Indian Pueblo Council; Navajo Nation.*
4. Perform genomic sequencing (whole genome, whole exome, transcriptome / RNA sequencing) on retrospective multiethnic (Hispanic, American Indian, Non-Hispanic White) case control cohorts of cancers with disparities in New Mexico (hepatobiliary, kidney, bladder, colon, head/neck, ovarian) to discover novel cancer causing mutations in different ethnic groups that are potentially treatable with targetable therapies, and, unique whole genome mutational signatures reflective of specific environmental and dietary exposures.
   - *UNMCCC, Medicine, Pathology, Surgery, Pediatrics, OB/GYN, College of Pharmacy, Los Alamos National Laboratory*

Environmental Exposures in Cancer Causation

Environmental Contamination in AI Lands in the Southwest

Arsenic in Unregulated Well Water on Reservations

Abandoned Uranium Mines (Navajo, Pueblo)

Gold King Mine Disaster >250,000 SW Mines

NIH ES021100 (ViCTER): *Impact of Zinc Status on Susceptibility to Arsenic-Induced Toxicity*

NIEHS P50 Centers of Excellence on Environmental Health Disparities Research: *Center for Native American Health Equity Research*

NIH 5U01TS000135: *Prospective Birth Cohort Study Involving Uranium Exposure in the Navajo Nation*

NIH 3P20MD004811-02S1: *Supplement to the NM CARES Health Disparities Center; Project 2: Zinc Intervention for Uranium Toxicity*

Expansion of UNMCCC Clinical Facility and New Cancer Programs

2nd Floor:

- The UNM Women's Cancer Center (Breast, GYN Cancers)
- Cancer Surgery Specialty Clinics (Orthopedic, GI/Liver, Thoracic Oncology):
  - Head and Neck Cancers with Dental Medicine and Maxillofacial Reconstructive Surgery
  - Genitourinary Cancers: Prostate, Bladder, Kidney

4th Floor:

- State's Only Accredited Bone Marrow /Stem Cell Transplantation and Cell-Based Immunotherapy Program
- Phase I (First in Human) Clinical Trials Unit
- Infusion Expansion (38 Additional Chairs; 66 Total)

Additional Cancer Clinical Service Lines:

- Adolescent and Young Adult Cancer Clinic (Age: 15-30 Years)
- Neuro-Oncology Clinic: Brain and Spinal Cord Tumors
- Cancer Survivorship, Palliative Care, Rehabilitation Clinics

Matthew Fero, MD, PHD
Fred Hutchinson Cancer Center

UNM COMPREHENSIVE CANCER CENTER

THE REVOLUTION IN CANCER MEDICINE

- **IMMUNOTHERAPY**

Olivier Rixe, MD, PhD

Associate Director, Clinical Research

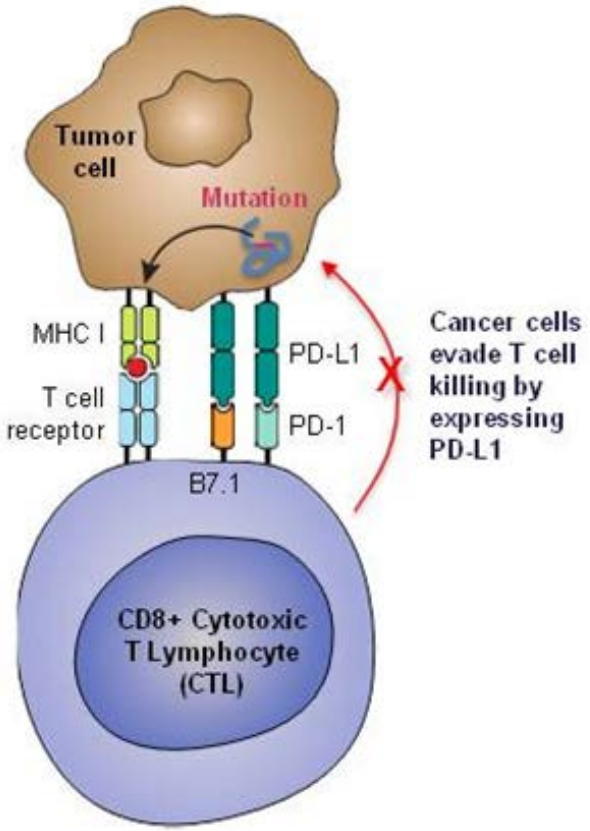
Paris, France

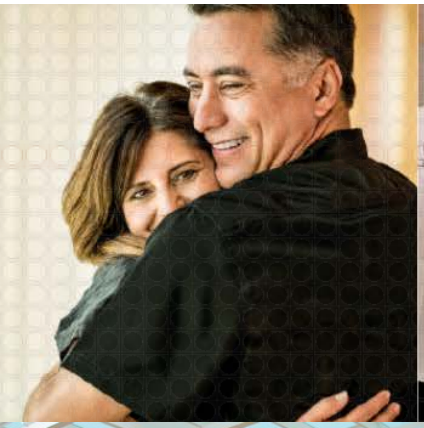
Jacque Chirac Prize

Former Director, Gustave Roussy Institute

IMMUNOTHERAPY: TARGETING PD-1 / PDL-1

- Many human cancers elicit an immune response to proteins on a cancer cell surface
- How do we harness that to kill cancer cells, regardless of the genomic mutations present?
- HOWEVER, Cancer cells may also evade killing by the immune system by expressing PD-L1 and blocking anti-cancer T cells
- New anti PD-L1 treatments are having dramatic impacts in lung kidney, melanoma, and other cancers






UNM Cancer Treatment & Clinical Research Facility
A National Cancer Institute Designated Cancer Center
The Official Cancer Center of New Mexico


Cancer Center
Radiation Therapy
Main Elevators