

**EPIDEMIOLOGY AND  
POPULATION SCIENCES  
2020 ANNUAL REPORT**

## SECTION OF EPIDEMIOLOGY AND POPULATION SCIENCES



**INTERIM SECTION CHIEF**

*Chris Amos, Ph.D.*

The Section of Epidemiology and Population Sciences studies the role that endogenous and exogenous sources have in the development of complex human diseases. Sources of exposures include genetic, behavioral and environmental factors that can have effects through intermediate processes such as epigenetic obesity or metabolic processes. Because we focus on complex disease etiology, we also use and develop quantitative approaches and study model systems to understand the mechanisms in disease biology. Particular strengths of the section include genetic and molecular epidemiology, statistical genetics, geospatial effects on risk and behavioral epidemiology. The Institute of Clinical and Translational Research is housed in the Section of Epidemiology and Population Sciences and co-led by Drs. Amos and Balasubramanyam.

Our mission is to create a premiere multidisciplinary research program in epidemiology and population sciences (including but not limited to cancer prevention sciences) that is translational in nature and has relevance to the patients and the population that the College serves. Our goal is to foster the highest quality epidemiologic research and to serve as the centralized resource for the college for innovative epidemiologic research, collaboration, education, and service.

To achieve these objectives, we will:

- Conduct nationally and internationally recognized and well-funded multidisciplinary epidemiology research.
- Continue to focus on areas of existing faculty expertise in adult and pediatric cancer epidemiology.
- Perform additional faculty recruitment in nutritional epidemiology/ obesity research, pharmacogenomics, cancer control and screening, and survivorship/outcomes.
- Extend research too diabetes, neurosciences and cardiovascular clinical science.
- Translate research to the scientific community, general public and beyond, including underserved monitories and high-risk communities.

A handwritten signature in black ink that reads "Chris Amos".

Chris Amos, Ph.D.  
Professor of Medicine  
Interim Chief, Epidemiology and Population Sciences  
Baylor College of Medicine

## HIGHLIGHTS

- **Dr. Amos** serves as the Principal Investigator for several grants. He leads the Integrative Analysis of Lung Cancer Risk and Etiology, which is focusing on identifying risk factors for lung cancer beyond smoking and developing biomarkers for early detection. He completed an analysis identifying a variant of the ATM gene that increases risk for lung cancer by about 5-fold in nonsmoking women and is rare in all populations except Ashkenazim, where it occurs in about 4% of individuals.
- He also leads a new grant studying familial lung cancer and an extension of the molecular characterization of screen detected lesions network. He is also serving as the PI for data coordination and statistical analysis for the Texas Hepatocellular Carcinoma Consortium and the Collaborative Action Program to Reduce Liver Cancer Mortality in Texas: Collaborative Action Center. Finally, he has been leading the Epidemiology, Population Sciences and Genetics committee for the institutional response to COVID-19. Dr. Amos also serves as multiple PI on a grant studying genetic and host-specific factors for liver cancer, a grant studying variation in p53 and their risk effects on cancers and a new grant that is studying characteristics of risk for colon polyps using data from the New Hampshire Colonoscopy Registry.
- **Dr. Amos** leads an inter-institutional project with Jason Huse in the MDACC Brain Tumor SPORC entitled “Somatic and germline distinctions arising in Blacks and Hispanics.” Dr. Amos is also collaborating with Dr. Bondy and colleagues to complete multiple publications using Mendelian randomization and LD Score Regression using data from several different cancer types including lung, brain and liver cancer and using phenome-wide analysis to understand genetic architecture using data from the UK Biobank Data.
- **Dr. Cheng** showed that baseline or post-diagnostic exposure to simvastatin and atorvastatin was associated with extended survival in non-small-cell lung cancer. Drs. Amos and Cheng applied a biological model to characterize outcomes following immunotherapy for renal cancer. Dr. Amos serves as PI of the Coordinating Center for the Molecular Characterization of Screen-Detected Lesions Network (U01), which includes the design of new studies. Drs. Amos and Cheng developed a computational immune profiling model for early-stage lung cancer. This algorithm can infer immune cell infiltration in tumor tissues based on gene expression data.
- Dr. Cheng recently completed a study of the role that VISTA has in the development of autoimmunity and suppression of cancer by studying its impact in immunomodulation using single-cell RNA sequencing methods. Dr. Amos assisted Dr. El-Serag to develop a coordinating center grant for studying hepatocellular carcinoma. Dr. Amos serves as a co-leader for the newly awarded NIEHS core grant supporting the Center for Precision Environmental Health under Dr. Cheryl Walker.

- **Dr. Cheng** has collaborated with Dr. Noelle to elucidate the critical function of the VISTA gene in naïve T cell quiescence and peripheral tolerance using mouse knockout model. VISTA is an immune checkpoint gene in addition to PD-L1, PD-1, and CTLA-4, which provide a new immunotherapeutic target for treating cancer and immune diseases.
- **Dr. Badr** is currently conducting a multi-site randomized controlled trial of CareSTEPS, a psychosocial intervention for informal caregivers of advanced lung cancer patients. Dr. Badr received a discovery award from the NCI to participate in the Speeding Research Interventions into Practice (SPRINT) program and develop an implementation plan for moving CareSTEPS into clinical practice settings.
- **Drs. Thrift and El-Serag** have an active research program in Barrett's Esophagus (BE), a precursor to esophageal adenocarcinoma (EAC). EAC is a rapidly advancing cancer in white males in our catchment area. Drs. Thrift and El-Serag have published >25 relevant papers during the past five years and identified risk factors associated with BE and EAC.
- Prostate cancer in African American men is one of the high- risk cancers in our catchment area. There are several initiatives under way to address this problem. **Drs. Bondy and Thrift** are the Texas PIs for the RESPOND African American Prostate Cancer Study, the largest study to date of prostate cancer in African Americans.
- An inter-programmatic collaboration among **Drs. Liu, Amos, and Spitz** led to the discovery of rare variants in the lymphotoxin beta gene, prolyl 3-hydroxylase gene, and disheveled associated activator of morphogenesis 2 gene that strongly associated with increased risk of lung cancer among individuals with a family history of lung cancer. **Dr. Li** used data from the OncoArray project to identify novel gene- gene interactions that affect lung cancer risk, which led to her successful R21 application.



*During the pandemic, Dr. Thrift and team continue to work remotely on the Respond - Prostrate Study in African American men.*



*Cancer Prevention Research In Texas (CPRIT) PI and Trainees. Front Row (left/right): Margaret Spitz, Quinn Ostrom Xiaotao Zhang, Ahsan Raza. Second Row (left/right) Wilson da Costa, Jeremy Schraw, Alex Renwick*

- **Dr. Minard** leads the biostatistical core for the ICTR and won an award from the Graduate School for Biomedical Science with Dr. Hilsenbeck for best teaching for a required course in biostatistics for graduate students.

## **FACULTY**

### ***Interim Chief***

- Christopher Amos, Ph.D.

### ***Faculty***

- Hoda Badr, Ph.D.
- Jinyoung Byun, Ph.D.
- Chao Cheng, Ph.D.
- Ivan Gorlova, Ph.D.
- Olga Gorlova, Ph.D.
- Younghun Han, Ph.D.
- Yafang Li, Ph.D.
- Yong Li, Ph.D.
- Yanhong Liu, Ph.D.
- Abiodun Oluyomi, Ph.D.
- Bo Peng, Ph.D.
- Margaret Spitz, M.D.
- Aaron Thrift, Ph.D.
- Quinn Ostrom, Ph. D.
- Syed Ahsan Raza, M.D., Ph.D.
- Alexander Renwick, Ph.D.
- Navid Sobhani, Ph.D.
- Xinfang Yu, Ph.D.
- Xiaotao Zhang, Ph.D.
- Zhihui Zhang, Ph.D.

### ***Secondary Appointments***

- Richard Finnell, Ph.D.
- Philip Lupo, Ph.D.
- Javad Razjouyan, Ph.D.
- Michel Scheurer, Ph.D.
- Lea Steele, Ph.D.
- Elaine Symanski, Ph.D.
- Cheryl Walker, Ph.D.

### ***Postdoctoral Associates***

- Wilson Da Costa Jr. M.D., Ph.D.
- Maral Adel Fahmideh, Ph.D.
- Chunmei Fan, Ph.D.
- Chongming Jiang, Ph.D.
- Wei Li, Ph.D.

### ***Adjunct Appointments***

- Elmer Bernstram, Ph.D.
- Tuna Mustaffe, Ph.D.

## HONORS AND AWARDS

### Hoda Badr, Ph.D.

- Fellow in the 2020-2021, Hedwig van Ameringen Executive Leadership in Academic Medicine (ELAM) Program for Women

### Xiaotao Zhang, Ph.D.

- American Association of Cancer Research-Bristol-Meyers Squibb Oncology Scholar-in-Training Award



*Hoda Badr finds balance during Covid, working both remotely and in office.*

## PROFESSIONAL ORGANIZATIONS/ASSOCIATIONS OFFICES HELD

### Hoda Badr, Ph.D.

- Cancer Alliance of Texas, Member, Survivorship Working Group
- National Alliance for Caregiving, Bridging Policy Gaps in Caregiving Services and Supports Task Force Member

### Charles Minard, Ph.D.

- American Statistical Association
- Faculty Senator

### Xiaotao Zhang, Ph.D.

- Cancer and Aging Research Group
- American Association of Cancer Research
- American Society of Preventive Oncology

### Jing Zhao, Ph.D.

- American Association for Cancer Research, Associate Member (12/2019)

## EDITORIAL BOARD MEMBERSHIP AND POSITIONS

### Hoda Badr, Ph.D.

- Associate Editor, *Journal of Psychosocial Oncology*
- Consulting Editor, *Journal of Family Psychology*
- Editorial Board Member, *Annals of Behavioral Medicine*

### Wilson Da Costa Jr, M.D., Ph.D.

- Associate Editor, *Brazilian Journal of Oncology*

### Yong Li, Ph.D.

- *Genes and Diseases*

**Olga Gorlova, Ph.D.**

- Academic Editor, *PLoS One*

**Xiaotao Zhang, Ph.D.**

- Associate Editor, *BMC Cancer*
- Associate Editor, *BMC Public Health*

**OTHER SIGNIFICANT ACCOMPLISHMENTS****Hoda Badr, Ph.D.**

- Own the rabbit hole: Experiences of an NCI SPRINT program participant. Presented at the 44th Annual Conference of the American Society of Preventive Oncology (ASPO), 03/2020.
- Research in Cancer Caregiving: Themes, Gaps, Challenges, and Opportunities. Society of Behavioral Medicine Grand Rounds Webinar. 09/19.

**RESEARCH ACTIVITIES****Grants****Chris Amos, Ph.D.**

- Risk Stratification for Early Detection of Liver Cancer; NIH/NCI; \$505,467
- Sequencing Familial Lung Cancer; NIH/NCI, \$735,139
- Evaluation of Genetic, Clinical, and Environmental Risk Factors to Establish Effective Strategies for Second Primary Lung Cancer, NIH/NCI; \$22,445 (sub)
- Precision Approaches to Refining TP53-Associated Cancer Risk, NIH/NCI; \$95,068
- Center for Molecular and Cellular Finding of Screen-Detected Lung Lesions; NCI/NIH; \$685,728
- Gulf Coast Center for Precision Environmental Health; NIH/NIEHS; \$1,000,000
- Statistical Methods and Tools for Cancer Risk Prediction in Families with Germline Mutations in TP53; NIH/ NCI; \$14,712 (sub)
- SPORE in Brain Cancer, Project 3, NIH/NCI; \$237,147
- Integrative Analysis of Lung Cancer Etiology and Risk; NIH/NCI; \$2,293,303
- Evaluating Lung Cancer Etiology and Risk through Clinical and Genomic Analysis; CPRIT; \$1,128,437

**Chao Cheng, Ph.D.**

- Computational Identification of New Candidate Drugs for Lung Cancer Treatment; NIH/NCI \$173,765
- Integrative Computational Approaches for Improving Cancer Immunotherapy; CPRIT; \$913,633
- Tissue Resident Memory T-Cell Responses to Cancer; NIH/NCI; \$9,557 (sub)

**Ivan Gorlov, Ph.D.**

- Integration of Clinical and Molecular Biomarkers for Melanoma Survival (sub), NIH/NCI; \$143,650

**Yafang Li, Ph.D.**

- Genetic Interaction Analysis Involving Oncogenesis Related Genes in Lung Cancer; NCI/NIH; \$169,149

**Yong Li, Ph.D.**

- TP53 Germline Mutations: Beyond LFS, NCI/NIH, \$366,000
- Dietary Carcinogens for Colorectal Cancer, NCI/NIH, \$366,000
- Comprehensive Analyses of Cancer Etiological Factors, CPRIT, \$1,668,098
- Polycyclic aromatic hydrocarbons: ultra-sensitive detection, early life exposures-clinical outcomes (preterm births, chronic lung disease, and neurocognitive deficits), prevention and remediation, NIEHS/NIH, Co-I on Project 3 and a member of the administrative and research translation core
- Direct targeting the MYD88 L265P driver mutation in Waldenstrom's Macroglobulinemia, International Waldenstrom's Macroglobulinemia Foundation, \$180,000
- MYC as a Biomarker in Aggressive Non-Hodgkin Lymphoma, NCI/NIH, \$384,959
- Modulation of MicroRNAs with Xenobiotics to Target c-Myc, NCI/NIH, \$278,699
- Identification of small molecule inhibitors of CRLA-4, Atomwise, In-kind support
- Identification of small molecule inhibitors of mutant MYD88 L265P, Atomwise, In-kind support

**Margaret Spitz, M.D.**

- Cancer Prevention Post-Graduate Training Program in Integrative Epidemiology; CPRIT; \$750,097

**Elaine Symanski, Ph.D.**

- Environmental Defense Fund Health Disparities, Enviro Defense Fund; \$28,390

**Aaron Thrift, Ph.D.**

- The Gut Microbiome in Cirrhosis and Hepatocellular Carcinoma; NCI; \$50,000
- Admixture Mapping of Cirrhosis and Hepatocellular Carcinoma in African Americans; NCI; \$50,000
- Prevent HCC – Through Screening Vaccination and Treatment of Viral Hepatitis; CPRIT; \$494,590
- Prevalence and Predictors of Non-Alcoholic Fatty Liver Disease in Veterans; Dept. Veterans Affairs; \$200,000
- DCC HHS Smoking Cessation Treatment Program; NCI; \$157,729

## ***Publications***

- Academic Emergency Medicine (IF **3.064**): 1
- American Journal of Hematology (IF **6.973**): 1
- Anesthesia & Analgesia (IF **4.305**): 1
- Bioinformatics (IF **5.610**): 1
- Blood Advances (IF **4.584**): 1
- Blood Cancer Journal (IF **6.510**): 1
- BMC Cancer (IF **3.030**): 1
- BMC Medical Genomics (IF **2.570**): 2
- BMC Supportive and Palliative Care (IF **2.681**): 1
- Breast Cancer Research (IF **4.988**): 1
- Cancer Epidemiology Biomarkers & Prevention (IF **4.344**): 4
- Cancer Immunology Research (IF **8.728**): 1
- Cancer Letters (IF **7.360**): 1
- Carcinogenesis (IF **4.603**): 1
- Cell Reports (IF **8.109**): 1
- Clinical Cancer Research (IF **10.107**): 3
- Contemporary Clinical Trials (IF **1.832**): 1
- Current Oncology Reports (IF **3.828**): 1
- Diabetes Technology and Therapeutics (IF **5.070**): 1
- Experimental Hematology & Oncology (IF **3.492**): 1
- FASEB Journal (IF **4.966**): 2
- Global Advances in Health and Medicine (IF **1.097**): 1
- Health Behavior and Policy Review (N/A): 1
- Human Mutation (IF **4.124**): 1
- International Journal of Molecular Sciences (IF **4.556**): 2
- International Journal of Pediatric Endocrinology (IF **0.290**): 1
- JAMA Oncology (IF **24.799**): 1
- JCI Insight (IF **6.205**): 1
- Journal of Immunotherapy of Cancer (IF **9.913**): 1
- Journal of Asthma (IF **1.899**): 1
- Journal of Behavioral Medicine (IF **2.988**): 1
- Journal of Cellular Biochemistry (IF **4.237**): 1
- Journal of Geriatric Oncology (IF **3.164**): 2
- Journal of Hematology & Oncology (IF **11.059**): 3
- Journal of Infectious Disease (IF **4.730**): 1
- Journal of Medical Internet Research (IF **5.034**): 1
- Journal of Neuro-Oncology (IF **3.267**): 2
- Journal of Neurosurgery (IF **3.968**): 1
- Journal of Parenteral and Enteral Nutrition (IF **2.853**): 1
- Journal of Pediatric Psychology (IF **2.587**): 1
- Journal of Surgical Oncology (IF **2.771**): 2
- Journal of the NCI Cancer Spectrum (N/A): 1
- Journal of Thoracic Oncology (IF **13.357**): 1
- Laryngoscopy (IF **2.465**): 1
- Molecular Cancer (IF **15.302**): 4
- Nature Communications (IF **12.121**): 1
- Nature Reviews Clinical Oncology (IF **53.276**): 1
- Neuro-Oncology (IF **10.247**): 1
- OncoImmunology (IF **5.869**): 1

- Pediatric Allergy and Immunology (IF **4.699**): 1
- Pediatric Blood and Cancer Journal (IF **2.355**): 2
- PloS One (IF **2.740**): 1
- Science (IF **41.845**): 1
- Scientific Reports (IF **3.998**): 2
- Seminars in Oncology Nursing (IF **1.330**): 1
- Social Networks (IF **2.931**): 1
- Supportive Care in Cancer (IF **2.635**): 1
- The British Journal of Psychiatry (IF **7.850**): 1
- The Lancet Oncology (IF **33.752**): 1
- Vaccine (IF **3.143**): 1

## ***Book Chapters***

### **Hoda Badr, Ph.D.**

- **Badr H** and Bitz C. Couples and cancer. In Breitbart W, Jacobsen P, Loscalzo M, Butow P, Lazenby M, and Lam W, editors. *Psycho-oncology, 4<sup>th</sup> edition*. New York, NY: Oxford University Press (In press).
- **Badr H**, Ahmad Z. Couple-relationships and Cancer Adaptation. In Robbins M, Sweeny K, editors. *Wiley Encyclopedia of Health Psychology: Volume II, The Social Bases of Health Behavior*. New York, NY: Wiley; In press.
- **Badr H**. Cancer. In Llewellyn CD, Ayres S, McManus C, Newman S, Petrie KJ, Revenson TA, and Weinman J, editors. *Cambridge Handbook of Psychology, Health and Medicine*. London, England. Cambridge University, 2019, Chp 102, 439-220.

## **PRESS**

### **Chris Amos, Ph.D.**

- VICE-United Kingdom, March 11, 2020. **Is It Safe to go to the Gym During a Coronavirus Outbreak?** [https://www.vice.com/en\\_uk/article/epgkdn/should-i-go-to-gym-coronavirus](https://www.vice.com/en_uk/article/epgkdn/should-i-go-to-gym-coronavirus)
- VICE-Australia, March 11, 2020. **Is It Safe to go to the Gym During a Coronavirus Outbreak?** [https://www.vice.com/en\\_au/article/epgkdn/is-it-safe-to-work-out-go-to-gym-exercise-class-coronavirus](https://www.vice.com/en_au/article/epgkdn/is-it-safe-to-work-out-go-to-gym-exercise-class-coronavirus)
- VICE-Asia, March 11, 2020. **Is It Safe to go to the Gym in the Midst of the Coronavirus Outbreak?** [https://www.vice.com/en\\_asia/article/epgkdn/is-it-safe-to-work-out-go-to-gym-exercise-](https://www.vice.com/en_asia/article/epgkdn/is-it-safe-to-work-out-go-to-gym-exercise-)
- April 7, 2020, San Antonio Express News. **88 COVID-19 patients are hospitalized in San Antonio. The number could be higher.** <https://www.expressnews.com/news/local/article/88-COVID-19-patients-are-hospitalized-in-San-15185753.php>
- April 14, 2020, Click2Houston News. **How does testing in Texas affect Modeling? Texas lags behind other states in coronavirus testing.** <https://www.click2houston.com/news/local/2020/04/17/texas-lags-behind-other-states-in-coronavirus-testing/>

- April 16, 2020, Click2Houston News. Counting deaths during COVID-19 pandemic. Texas lags behind other states in coronavirus testing. KPRC 2 investigates why we're not seeing widespread testing and why that's the key to getting things reopened. <https://www.click2houston.com/news/local/2020/04/17/texas-lags-behind-other-states-in-coronavirus-testing/>
- May 6, 2020, Texas Medical Center News. **Does acetaminophen cause cancer?** <https://www.tmc.edu/news/2020/05/does-acetaminophen-cause-cancer/>
- ASCO Post, May 21, 2020. **Germline Genetic Variants in ATM and Lung Cancer Susceptibility.** <https://www.ascopost.com/news/may-2020/germline-genetic-variants-in-atm-and-lung-cancer-susceptibility/>
- June 22, 2020, Houston Chronicle. **With shutdown success evaporated, model suggests mid-July peak for COVID-19 in Houston.** <https://www.houstonchronicle.com/news/houston-texas/houston/article/With-shutdown-success-evaporated-model-suggests-15358664.php>
- Kaiser Health News, June 23, 2020. **“It Is Snowballing”: Public Health Experts Alarmed By Dramatic Surges As States Continue To Open.** <https://khn.org/morning-breakout/it-is-snowballing-public-health-experts-alarmed-by-dramatic-surges-as-states-continue-to-reopen/>
- June 23, 2020, KHOU Channel 11 News. **Houston vaccine scientist: It's time to roll back the reopening to stop the spike in COVID-19 cases.** <https://www.khou.com/article/news/health/coronavirus/houston-vaccine-scientist-its-time-to-roll-back-the-reopening/285-9256639e-bb27-4582-a95b-b3b1fb03b37e>
- June 23, 2020, KPRC Channel 2 News. **Local hospitals looking at two-phase surge plan if current trend continue.** <https://www.click2houston.com/news/local/2020/06/24/local-hospitals-looking-at-two-phase-surge-plan-if-current-trends-continue/>
- My High Plains, June 24, 2020. **Houston, Texas Hospitals See Surge in COVID-19 Cases.** <https://www.myhighplains.com/news/houston-texas-hospitals-see-surge-in-covid-19-cases/>
- WNKY News, June 24, 2020. **Houston, Texas Hospitals See Surge in COVID-19 Cases.** <https://www.wnky.com/houston-texas-hospitals-see-surge-in-covid-19-cases/>
- June 26, 2020, WPIX (NYC). **COVID spread in Texas vs. New York City** (no link available)
- June 29, 2020, Medpage Today. **COVID Trials Threatened by Shifting Surges.** <https://www.medpagetoday.com/infectiousdisease/covid19/87314>