

CURRICULUM VITAE (CV)
Robin T. Varghese, PhD

CURRENT POSITION

Associate Professor of Genetics, Genetics Course Director, Edward Via College of Osteopathic Medicine (VCOM), Blacksburg, VA

CONTACT INFORMATION

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EDUCATION

College	Texas A&M University, Corpus Christi, TX, 2006, B.S. Biology
Graduate School	Virginia Polytechnic Institute and State University, Blacksburg, VA, 2016, Ph.D. Genetics Bioinformatics and Computational Biology
Post doctorate	Postdoctoral fellowship, Virginia Tech Carilion Research Institute – Cancer Biology: Sheng Lab, 2016 Postdoctoral fellowship, Edward Via College of Osteopathic Medicine- Precision Medicine and Bioinformatics: Garner Lab, 2016-2018

ACADEMIC APPOINTMENTS

2007-2011; Research Assistant, Human Genome Sequencing Center, Baylor College of Medicine, Houston, TX

2011-2014; Graduate Research Assistant, Virginia Bioinformatics Institute, Virginia Polytechnic Institute and State University, Blacksburg, VA

2014-2016; Graduate Research Assistant, Virginia Tech Carilion Research Institute, Virginia Polytechnic Institute and State University, Roanoke, VA

2018-2024; Assistant Professor and Course Director for Genetics, Edward Via Virginia College of Osteopathic Medicine, Blacksburg, VA

2018-present; Adjunct Professor and Course Director for Genetics, MABS program, Bluefield University, Bluefield, VA

2022-present; Adjunct Associate Professor, Department of Biomedical Sciences and Pathobiology, Virginia-Maryland College of Veterinary Medicine, Blacksburg, VA

TEACHING EXPERIENCE

Teaching currently at VCOM

Genetics (7025) Course Director, 2019-present
Cell Biology & Physiology lectures, 2019-present
Professionalism and Ethics, 2023

Research modules for DO with distinction curriculum, 2019-present
Including students who are currently enrolled and students who graduated with honor.

Research Mentor (Research 8700)

Includes multiple 3rd and 4th year students

Teaching currently at MABS

Human Genetics (5502) Course Director, 2018-present

Biochemistry (5104) lectures, 2018-2023

PROFESSIONAL AFFILIATIONS

2015-present; member of American Association of Cancer Research (AACR)

2022-present; Association of Professors of Human and Medical Genetics (APHMG)

HONORS AND AWARDS

NSF S STEM Award, Virginia Polytechnic Institute and State University 2013

RVGS H.E.R.O. Honoree, Roanoke Valley Governor's School 2019

Honorable Mention for Teacher of the Block- Class of 2025 2022

PROFESSIONAL SERVICE

The Edward J. Stemmler, MD Medical Education Research Grant Reviewer- (NBME)

Invited Reviewer: Frontiers in Oncology

Invited Reviewer: Frontiers in Pharmacology

Invited Reviewer: International Journal of Molecular Sciences (MDPI)

Invited Reviewer: PlosOne

Invited Reviewer: Cureus

MENTORING ACTIVITIES

Christy Smith- (co-mentor) 2018-2019, VCOM medical student who worked in my lab presented a poster at VCOM Research Day in 2018 and co-authored a published manuscript. DO awarded

Jessica Kim- (co-mentor) 2018-2019, VCOM medical student who worked in my lab presented a poster at VCOM Research Day in 2018 and co-authored a published manuscript. DO awarded

Anne Barnes- (mentor) 2018-2021, VCOM medical student who worked in my lab and will be a co-author on an upcoming manuscript. DO awarded

Mary Klacik-(mentor) 2018-2021, VCOM medical student in lab who worked in my lab and will be a co-author on an upcoming manuscript. DO awarded

Craig Johnson- (mentor) 2018-2019, VCOM medical student in lab who worked in my lab and co-authored a published manuscript. DO awarded

Jessica Kim- (mentor) 2019-2021, VCOM medical student who worked in my lab presented a poster at VCOM Research Day in 2020 and will be a first author on an upcoming manuscript. DO awarded

Katie Salim- (mentor) 2019-2021, VCOM medical student who worked in my lab and will be a co-author on an upcoming manuscript. DO awarded

Peter Samuel- (mentor for DO with Research Distinction) 2018-2022-VCOM medical student who worked in my lab on multiple projects. During his time in my lab, Peter was co-author on two posters for VCOM Research day, published two manuscripts, and was invited to speak about our projects at Ferrum College (2022). Peter will also be first author on an upcoming manuscript and 2nd author on another article. DO awarded with Research Distinction

Kevin Sheng- (mentor) 2018-2022. High School student who I mentored in my lab. Kevin presented his work and received 1st Place Leidos Award for Excellence in Computational Science, 2019. He was also a Virginia State Science and Engineering Fair Finalist a Google science fair regional finalist, named top 300 scholar in the 79th Regeneron Science Talent Search and 4th Place Grand Award in Biomedical and Health Sciences at the Intel International Science and Engineering Fair, 2019. Kevin and I are co-inventors on a provisional patent (2019) and International Patent Application (2020). Kevin was the first author of two published manuscripts and co-author on another published manuscript. Kevin graduated high school from RVGS and is currently attending Duke University, NC.

Patrick Beck- (co-mentor) 2019-present, Virginia Tech Carilion (VTC) School of Medicine student, collaboration project with VTC faculty. Patrick presented his work via oral presentation at VTC on 4/22 and a poster presentation at the 2022 ASCO Annual Meeting I-published abstract

Trenton Kite- (committee member- DO with Research Distinction) 2022-present, VCOM student, DO with research distinction

Olivia Silveri- (committee member- DO with Research Distinction) 2022- present, VCOM student, DO with research distinction - Committee Member

Shivram Guraju- (co-Mentor) 2023- present, Co-PI of VCOM student who submitted a systematic review to the journal *Cureus* ,“The Influence of Diet and Genetics on Non-Alcoholic Fatty Liver Disease (NAFLD) in the South Asian Population “

Shourik Dutta- (co-mentor) 2023-present, VCOM medical student in lab working on research project headed by Dr. Anandakrishnan

Rajvi Patel- (co-mentor) 2023-present, VCOM medical student in lab working on research project headed by Dr. Anandakrishnan

Allen Saar- (mentor) 2023-present, VCOM medical student who works on the POAF project and will be a co-author on an upcoming manuscript.

Erin Field- (co-mentor) 2023-present, VCOM medical student works on project involving a family from Dominican Republic suspected to have inherited cardiomyopathy

Kaitlin Murphy VCOM medical student works on project involving a family from Dominican Republic suspected to have inherited cardiomyopathy

Brendan Raville VCOM medical student works on project involving a family from Dominican Republic suspected to have inherited cardiomyopathy

4th year Research Mentor (Research 8700) 7 VCOM students (2022)

INSTITUTIONAL SERVICE

Adviser for 12 first year students

Adviser for 12 second year students

Judge at 34th annual Graduate Research Symposium and Exposition-Virginia Tech 2018

Bluefield University Research Class Discussion Panelist 2021,2023

Poster judge for VCOM Research Day 2019, 2022, 2023

Campus Diversity and Inclusion Committee 2023-present

GRANTS and CONTRACTS

Current

VCOM/VT One Health Grant 07/01/24 – 06/30/2025

Title: Understanding mechanisms by which MmuPV1 E6 promotes proliferation

Goal: To determine shared mechanisms between HPV E6 oncoproteins and the MmuPV1 E6 oncoprotein which can be used to determine common cellular processes altered by papillomavirus infection

Role: Co-PI

Completed

VCOM Research Eureka Accelerator Program (REAP) 07/01/18 – 06/30/2019.

Title: Bringing Precision Medicine to Anatomy Lab

Goal: The goal of this study is to implement precision medicine in the anatomy lab medical school curriculum utilizing cadaveric DNA and DNA sequencing technology.

Role: PI

Health and Human Services, 1 ORIIR180040-01-00 06/01/18 – 05/31/19

Identifying and quantifying the level of questionable abstract publications at scientific meetings

Goal: Develop and demonstrate high-throughput techniques to evaluate the biomedical scientific corpus for possible violations of ethical publishing standards (e.g. etblast.org).

Role: Investigator (PI: H. Garner)

Orbit Genomics

02/12/20 – 04/30/20

Title: Lung Cancer Panel Validation Study

Goal: The goal of the program is to validate the Lung Cancer Risk genomic diagnostic with independent, de-identified blinded samples.

Role: Investigator (PI: H. Garner)

Orbit Genomics

05/01/19 – 04/30/20

Title: Development of a Pancreatic Cancer Risk Assay (Phases I and II)

Goal: Develop a proprietary microsatellite-based risk classifier for Pancreatic Cancer Risk Diagnostic based on Orbit Genomics microsatellite biomarker discovery process.

Role: Investigator (PI: H. Garner)

VCOM Research Eureka Accelerator Program (REAP) 07/01/19 – 12/31/20

Title: Chelation therapy salvages the DNA damaging effects of lead and cadmium on endothelial cells

Goal: The goal of this study is to discover genomic risk markers of patients who experience post-operative atrial fibrillation following cardiothoracic surgery by analyzing variations in microsatellite genomic regions, SNPS, and INDELs.

Role: PI

VCOM Research Eureka Accelerator Program (REAP) 07/01/19 – 10/31/20

Title: OR2T7: A prognostic marker and a potential therapeutic target for glioblastoma

Goal: The goal of the proposed work is to investigate the role of OR2T7 in tumor progression.

Role: Co-PI (PI: R. Anandakrishnan)

VCOM Research Eureka Accelerator Program (REAP) 07/01/20 – 06/30/21

Title: Investigating the effect of a rare mutation in Fetuin-B on the progression of Acute Myeloid Leukemia

Goal: The goal of this project is to identify cellular pathways affected by the T292Nfs* variant in Fetuin-B, to determine if the variant may contribute to the progression of AML.

Role: Investigator (PI: R. Anandakrishnan)

VCOM Research Eureka Accelerator Program (REAP) 07/01/20 – 06/30/21

Title: Linking the gut microbiome, female reproduction and obesity: Identifying protective molecular mechanisms of the bacterial metabolite, Indole-3-propionic acid, in ovarian and placental cells against obesity-induced cellular stress

Goal: The overall goal of this proposal is to begin identifying the functional relevance of IPA in ovarian and placental cells in the context of a normal and obesogenic environment in vitro.

Role: Co-PI (Co-PI: M. Lipsmeyer)

VCOM Research Eureka Accelerator Program (REAP) 07/01/23 – 06/30/2024.

Title: Preliminary validation of a blood-based screening assay for lung cancer

Goal: The goal of this study is to design and optimize a blood based genomic screen for lung cancer based on our previous lab findings.

Role: Co-PI

PUBLICATIONS

1. Coventry A, Bull-Otterson LM, Liu X, **Varghese RT**, Maxwell TJ, et al. Deep resequencing reveals excess rare recent variants consistent with explosive population growth. *Nature Communications*. 2010 Nov 30; 1:131. PubMed PMID: 21119644; PubMed Central PMCID: PMC3060603.

2. Schaaf CP, Sabo A, Sakai Y, Crosby J, **Varghese R**, et al. Oligogenic heterozygosity in individuals with high-functioning autism spectrum disorders. *Human Molecular Genetics*. 2011 Sep 1;20(17):3366-75. PubMed PMID: 21624971; PubMed Central PMCID: PMC3153303.
3. Murphy SF, **Varghese RT**, Lamouille S, Guo S, Pridham KJ, et al. Connexin 43 Inhibition Sensitizes Chemoresistant Glioblastoma Cells to Temozolomide. *Cancer Research*. 2016 Jan 1; 76(1):139-49. PubMed PMID: 26542214.
4. **Varghese RT**, Liang Y, Guan T, Franck CT, Kelly DF, et al. Survival kinase genes present prognostic significance in glioblastoma. *Oncotarget*. 2016 Mar 4; PubMed PMID: 26956052.
5. Velmurugan KR, **Varghese RT**, Fonville N, Garner HR. High-depth, high accuracy microsatellite genotyping enables precision lung cancer risk classification. *Oncogene*. 2017 Nov 16;36(46):6383-6390.
6. Pridham, KJ, Le L, Guo S, **Varghese RT**, et al. PIK3CB/p110B is a Selective Survival Factor for Glioblastoma. *Neuro-Oncology*. 2017 Sep 16. Nox181
7. Kinney N, **Varghese RT**, Anandakrishnan R, Garner HR. ZDHHC3 as a Risk and Mortality Marker for Breast Cancer in African American Women. *Cancer Informatics*. Vol 16, 2017 Dec 13.
8. Pridham KJ, **Varghese RT**, Sheng Z. The Role of Class IA PI3K Catalytic Subunits in Glioblastoma. *Frontiers in Oncology*. 2017 Dec 15.
9. Kinney N, Larsen T, **Varghese RT**, Poelzing S, Garner HR & AlMahameed ST. Whole Exome Sequencing Reveals Response Signature in Atrial Fibrillation Patients Undergoing Initiation of Dofetilide Therapy, A Pilot Study. *Clinical Cardiology*. 2018 April 19 PMID:29671888
10. **Varghese RT**, Young S, Pham L, Liang Y, Pridham KJ, Guo S, Murphy SF, Kelly DF, Sheng Z. Casein Kinase 1 Epsilon Regulates Glioblastoma Cell Survival. *Scientific Reports*. 11 September 2018
11. Kinney N, Titus-Glover K, Wren JD, **Varghese RT**, et al CAGm: a repository of germline microsatellite variations in the 1000 genomes project. *Nucleic Acids Research*. 17 October 2018
12. Sheng KL, Pridham KJ, Sheng Z, Lamouille S, **Varghese RT** Functional Blockade of Small GTPase RAN Inhibits Glioblastoma Cell Viability. *Frontiers in Oncology*. 8 January 2019
13. Dash S, Kinney NA, **Varghese RT**, Garner HR, Feng WC, Anandakrishnan R. Differentiating between cancer and normal tissue samples using multi-hit combinations of genetic mutations. *Scientific reports*. Jan 30, 2019
14. Anandakrishnan R, **Varghese RT**, Kinney NA, Garner HR. Estimating the number of genetic mutations (hits) required for carcinogenesis based on the distribution of somatic mutations. *PLOS Computational Biology*. Mar 7, 2019
15. Nick Kinney, Lin Kang, Laurel Eckstrand, Arichanah Pulenthiran, Peter Samuel, Ramu Anandakrishnan, **Robin T. Varghese**, P. Michalak, Harold R. Garner. Abundance of ethnically biased microsatellites in human gene regions. *PLoS ONE*. Dec 12, 2019
16. Anandakrishnan R, Carpenetti TL, Samuel P, Wasko B, Johnson C, Smith C, Kim J, Michalak P, Kang L, Kinney N, Santo A, Anstrom J, Garner HR, **Varghese RT**. DNA sequencing of anatomy lab cadavers to provide hands-on precision medicine introduction to medical students. *BMC Med Educ*. 2020 Nov 16.
17. Sheng K.L, Kang L, Pridham K.J, Dunkenberg L.E, Sheng Z, **Varghese RT**. An integrated approach to biomarker discovery reveals gene signatures highly predictive of cancer progression. *Scientific Reports*. December 4, 2020
18. Pridham KJ, Shah F, Hutchings KR, Sheng KL, Guo S, Liu M, Kanabur P, Lamouille S, Lewis G, Morales M, Jourdan J, Grek CL, Ghatnekar GG, **Varghese R**, Kelly DF, Gourdie RG, Sheng Z. Connexin 43 confers chemoresistance through activating PI3K. *Oncogenesis*. 2022 Jan 12;11(1):2. doi: 10.1038/s41389-022-00378-7. PMID: 35022385; PMCID: PMC8755794.

Complete List of Published Work in My Bibliography:

<https://scholar.google.com/citations?user=yga0ZE8AAAAJ&hl=en&oi=ao>

<https://www.ncbi.nlm.nih.gov/sites/myncbi/1B1ovmyYijoAv/bibliography/41614316/public/?sort=date&direction=ascending>

PROFESSIONAL PRESENTATIONS

"The Role of Casein Kinase 1 Epsilon in Glioblastoma" GBCB Virginia Tech Seminar Series, March 2015.

Blacksburg, VA- Invited speaker

"Survival kinases identified by a kinome RNA interference screen are prognosis markers for glioblastoma"

GBCB Virginia Tech Seminar Series, Nov 2015. Blacksburg, VA - Invited speaker

"Novel prognostic markers for glioblastoma" Annual VTCRI Meeting, November 2015. Roanoke, VA

"Genomics in Medicine "VCOM 4th Annual Research Retreat 2017. Ashville, NC- Invited speaker

Highschool Outreach and Educational Tour Speaker (VCOM)- Genetics 2018-2019

"Research opportunities at VCOM" HCA- Lewis Gale, Salem, VA - 1/16/2019

"555 Presentation" at Annual VCOM Research Retreat 11/17/2019

"Bringing Precision Medicine to the Anatomy Lab" Virginia Tech, 02/05/2020- Invited speaker

ABSTRACTS

<https://scholar.google.com/citations?user=yga0ZE8AAAAJ&hl=en&oi=ao>

OTHER

Provisional Patent Filed — Virginia Tech Carilion Research Institute, Roanoke, VA

VTIP 15 – 082- Methods for Personalized Medicine: GBM Diagnosis and Treatment United States Letters

Patent Serial No. 62/144,387

Provisional Patent Filed –VCOM, Blacksburg, VA

Cancer Signatures, Methods of Generating Cancer Signatures, and Uses Thereof

Patent date filed Dec 20, 2019 Patent issuer and number US 62/951,084

International Patent Application Filed –VCOM, Blacksburg, VA

Title: Cancer Signatures, Methods of Generating Cancer Signatures, and Uses Thereof

Filed: Dec 20, 2020 us PCT/US20/66282

CANCER SIGNATURES, METHODS OF GENERATING CANCER SIGNATURES, AND USES THEREOF

App Num: US17/786,373 Pub Num:US20230044602A1 Pub Date: 2023-02-09