CURRICULUM VITAE

Brian H. Annex, M.D., F.A.C.C., F.A.H.A

Current Positions

2019 – present	J. Harold Harrison, M.D. Distinguished University Chair in Vascular Medicine Professor and Chair, Department of Medicine Medical College of Georgia at Augusta University Medical Director, General and Subspecialty Medicine Service Line AUMC AU Health System Service Line Lead for Wellstar – MCG Alliance
E-mail	bannex@augusta.edu (work), bannex2@gmail.com (preferred),
Licenses	Medicine, Georgia, 2019 - present Medical, State of Virginia, 2008-2019 Medical, State of North Carolina, 1988 - 2008 DEA, 1985- present, BA0923056
Home Address	3001 Bransford Rd. Augusta, GA 30909
Birthdate/place:	February 10, 1959. Brooklyn, NY

Previous Positions

2008 - 2019	George A. Beller/Lantheus Medical Imaging Distinguished Professor of Cardiovascular Medicine, Professor of Medicine (with Tenure) Chief, Division of Cardiovascular Medicine University of Virginia School of Medicine
2015 – 2019	Medical Director, Heart and Vascular Service Line, University of Virginia Health System Professor of Biomedical Engineering, Resident Faculty, Robert M. Berne Cardiovascular Research Center
2005-2008	Professor of Medicine (with Tenure) Vice-Chief for Research (2005 – 2007) Director, Vascular Medicine (2004 – 2008) Division of Cardiovascular Medicine Duke University School of Medicine, Durham, North Carolina
2003-2005	Associate Professor of Medicine with Tenure, Division of Cardiology Duke University School of Medicine, Durham, North Carolina
1999-2003	Associate Professor of Medicine, Division of Cardiology Duke University School of Medicine, Durham, North Carolina
1993-1999	Assistant Professor of Medicine, Division of Cardiology Duke University School of Medicine, Durham, North Carolina
1993-2008	Staff Cardiologist Durham Veterans Administration Medical Center

Education

1981 – 1985	Yale University School of Medicine, M.D. New Haven, CT.

1977 - 1981	State University of New York at Stony Brook, B.S. (Biochemistry), Stony Brook, NY

Post-Graduate Training

1992-1993	Interventional Cardiology Fellow, William Beaumont Hospital, Royal Oak, MI
1988-1992	Fellow, Division of Cardiology, Duke University Medical Center, Durham, NC
1986-1988	Resident, Department of Internal Medicine Tuft's-New England Medical Center, Boston, MA
1985-1986	Intern, Department of Internal Medicine Tuft's-New England Medical Center, Boston, MA

Organizations

American Association of Physicians
Association of University Cardiologist
American Clinical and Climatological Association

Fellow, American College of Cardiology
Fellow, American Heart Association
Fellow, Society of Vascular Medicine

Editorial Boards (current only)

Consulting Editor,	*Journal of Clinical Investigation*
Associate Editor,	*Vascular Medicine*
Associate Editor,	Completed 9 year term *Journal of American College of Cardiology: Basic and Translational Research*
Associate Editor,	*Atherosclerosis, Thrombosis, and Vascular Biology*

ABIM Board Certification

2023, 2024	American College of Cardiology, Maintenance of Certification (annual renewal)
2013	American Board Internal Medicine, Cardiovascular Diseases (2nd Re-Certification)
2002	American Board Internal Medicine, Cardiovascular Diseases (Re-Certification)
2000	American Board Internal Medicine, Interventional Cardiology (voluntarily not renewed)
1991	American Board Internal Medicine, Cardiovascular Diseases
1988	American Board Internal Medicine, Internal Medicine (no recertification required)
1985	National Board of Medical Examiners Part III

Awards/Honors/Service

2025	Master, Society of Vascular Medicine. Award given to 1 – 2 individuals per year for career achievements
2023	100 Years of Cardiology at the University of Virginia (invited speaker)
2023	Member, Scientific Advisory Board, CARE-T1D NHLBI-NIDDK CV Biorepository Collaboration
2016-2019	Treasurer, Association of Professors of Cardiology
2016	George R. Hermann Lecture

	Department of Internal Medicine University of Texas. Medical Branch, Galveston, Tx
2015	Keynote Speaker, George and Angelina Kostas Research Center for Cardiovascular Nanomedicine, Methodist Research Center
2014-2016	American Heart Association – Chairman, National Research Program Subcommittee of the National Research Council
2014-2019	Councilor, Association of Professors of Cardiology
2014-2018	External Advisory Board of the Center for Cardiovascular Disease and Science at LSU Health Science Center Shreveport
2014	Pepoon Visiting Professor, Oregon Health & Science University, Knight Cardiovascular Institute
2013	Inaugural Malcolm Feist Lecture on Translational Research in Cardiovascular Diseases. LSU-Health Science Center Shreveport, LA
2013	Visiting Professor in Vascular Medicine, Massachusetts General Hospital Boston, MA
2012	Visiting Professor: Cardiology Research Day and Keynote Talk Emory University
2011-2016	American Heart Association National Research Council (elected for 2 year term and renewed for second two year term)
2010	1st Recipient Outstanding Alumni Award: William Beaumont Hospital, Royal Oak MI. http://www.hcwreview.com/beaumont-hospitals-honors-7-outstanding-doctors/
2007	"Outstanding Mentor" Duke University Cardiology Fellows
2006	John and Nadine Murray Visiting Professor Division of Cardiology, University of Washington, Seattle
2002-2007	Board of Trustees, Society of Vascular Medicine and Biology
2001-2005	Established Investigator, American Heart Association
2000-2005	Investigator, Veterans Affairs Merit Review
1994-1995	Duke Heart Center, Career Development Award
1989-1990	Merck, Sharp & Dohme Academic Development Program Award

Peer-Review Study Sections

NIH

2022	Study Section ZRG1 SBIB-D (Surgery, Imaging, and Bioengineering), 10/22
2021	ZRG1 VH-C (10) B, Small Business Innovation Research Grant Applications (SBIR)

2018	VA Career Development Award Panel
2016	NHLBI Outstanding Investigator Award (OIA, R35)
2016	VA Career Development Award Panel
2015	ZRG1 OTC-K (55): Lasker Clinical Research Scholars Program (Si2)
2014	Center for Scientific Review (CSR): Vascular Cell Molecular Biology, Ad-hoc
2014	SBIR/STTR: Developing improved assessments of tissue oxygenation
2012	Special Emphasis Panel/Scientific Review Group HLBP 1 (PPG) meeting
2010	Special Emphasis Panel/Scientific Review Group HLBP 1 (PPG) meeting
2009	ZRG1 CVRS-L (02) M meeting
2008-2009	Chairman CSR: Clinical and Integrated Cardiovascular Sciences (CICS)
2005-2008	Member CSR: Clinical and Integrated Cardiovascular Sciences (CICS)
2007	Acting Chair CSR: Clinical and Integrated Cardiovascular Sciences (CICS) 02/07 and 10/07
2006	NIH/Clinical and Integrative Cardiovascular Sciences Special Emphasis Panel (Chair)
2006	NHLBI. Project Reviewer for CLEVER. A Multi-Center Randomized Trial of Exercise Training vs. PTA for Patients with Intermittent Cluadication due to Aorto-Iliac Disease
2005	Clinical and Integrated Cardiovascular Sciences (2 meetings)
2005	SEP ZRG1 MOSS-D 14, Muscle 6-05
2004	SEP ZAG1 ZIJ-5 01. Proteonomics in Aging

Non-NIH Study Sections

2023	American Heart Association: Collaborative Science Award
2022	American Heart Association: Collaborative Science Award
2021	Swiss National Foundation (Ad-hoc)
2020	Swiss National Foundation (Ad-hoc)
2015	National American Heart Association: Vascular Endothelial Biology
2014	Veterans Administration Career Development Grant (ad hoc X 2)
2003-2006	Phillips Morris Inc. External Grant Review
2003-2005	American Heart Association. Heritage Affiliate Cordis-Leon Interventional Fellowship Grant Review Panel
2000-2004	Mid-Atlantic Affiliate American Heart Association Atherosclerosis and Vascular Biology
2002	Veterans Administration Merit Review Grant
1999	Veterans Administration Merit Review Grant

Hospital/University Committees

2020-present	Member, Augusta University Health System. Columbia County Hospital Planning Committee
2020-present	Member, Georgia Cancer Center Planning Committee, Augusta University Health System
2019-present	Medical Executive Committee, Augusta University Health Associates
2020-2022	Member, Augusta University Health System, Diversity, Equity, Inclusivity Committee. One of only two Clinical Chairs on Committee.
2020-2021	Co-Chair Search Committee, Department of Surgery, Medical College of Georgia at Augusta University
2012-2016	Executive Committee, Heart and Vascular Center, Center of Excellence

2009-2011	Promotion and Tenure Committee, University of Virginia School of Medicine
2008-2009	Search Committee (Chairman), Chairman Department of Radiology, University of Virginia
2004-2005	Search Committee, Chief of the Division of Cardiology, Duke University
2002-2005	Duke University Medical Center, Institutional Review Board (IRB).
2002-2004	National Institute of Health/NHLBI. Vascular Medicine Working Group
2002-2004	American Heart Association. Atherosclerotic Vascular Disease Working Group
1997-2000	Durham VA Medical Center, Research and Development Committee
1995-1997	Duke University Medical Center, Clinical Research Unit Scientific Advisory Committee
2001-Present	President and Chief Executive Officer, Peripheral Atherosclerosis Research Consortium (PARC), www.arterial.org

Steering Committees/Data Safety and Monitoring Boards (including NIH DSMB's)

2023	Chair, National Institute Aging, Data Safety Monitoring Board for R01 Diet and Exercise in PAD Grant Number --- AG070086
2017-2020	Member, Clinical Adjudication Committee, Genfit RESOLVE-IT, Phase III trial in NASH
2014-2015	Member, Data Monitoring Committee for the ENDOMAX Phase III study, Medicines Company and Duke Clinical Research Institute
2013-2015	Member, Data Safety Monitoring Board for ePAD, Phase II Study, Daiichi-Sankyo Pharmaceuticals
2012-2013	Chairman, Data Safety and Monitoring Board REVIVE: TRC's Autologous Bone Marrow Cells in Patients with Peripheral Arterial Disease. Aastrom. Ann Arbor, Michigan
2007-2012	Medical Advisor to Data Safety and Monitoring Board Athresys, Inc. Cleveland, Ohio
2002-2016	Steering Committee/Scientific Advisor Hepatocyte Growth Factor Gene Therapy for Peripheral Arterial and Coronary Artery Disease. AnGes MG, Inc., Osaka, Japan Included presentation to the RAC and FDA
2006-2012	NHLBI. Project Reviewer for CLEVER. A Multi-Center Randomized Trial of Exercise Training vs. PTA for Patients with Intermittent Cluadication due to Aorto-Iliac Disease
2011-2012	Data Safety and Monitoring Committee Juventas Pharmaceuticals A phase 2a Study for SDF-1 Plasmid in CLI

2007-2012	Chairman, Data Safety and Monitoring Board TRC's Autologous Bone Marrow Cells in Patients with Peripheral Arterial Disease. Protocol ABI-55-0610-1. Aastrom. Ann Arbor, Michigan
2004-2008	Steering Committee Adenoviral HIF-1α in Patients with Peripheral Arterial Disease. Genzyme Inc. Cambridge, MA.
2001-2007	Steering Committee (Co-Director). A Phase II, Randomized, Double-Blind, Placebo-Controlled, Parallel Group, Efficacy and Safety Study of Different NV1FGF Regimens in Patients with Severe Peripheral Artery Occlusive Disease. BB-IND 8058. Aventis Pharm. Sciences, Paris, France.
2003-2006	Data Safety and Monitoring Board (Director) Vascular Architects Phase III Clinical Trials in PV Intereventions.. San Jose, CA.
2003-2005	Steering Committee Del-1 Plasmid Gene Therapy for Patients with Peripheral Arterial Disease. Valentis Pharmaceuticals. Burlingame, CA. Included presentation to the RAC and FDA
2001-2004	Steering Committee. Clopidigrel and Aspirin in Peripheral Arterial Disease (CAPS) study. Sanofi-Pharmaceuticals, New York, NY.
2003-2004	Steering Committee AGENT 4 Trial: International Phase III Gene Transfer Study using Ad5-FGF4 in Patients with Advanced Coronary Artery Disease.
2002-2003	Steering Committee (Director). A Double-Blind, Randomized, Placebo-Controlled, Dose-Ranging, 26-Week Study to Assess the Efficacy and Safety of CI-1023 (Ad-VEGF121.10) in Peripheral Arterial Disease Patients With Severe, Disabling Intermittent Claudication. Protocol 1023-005,GenVac, Gaithesburg, MD
2002-2003	Data Safety and Monitoring Board (Director) Protocol 118.1, COINART-1 (First Collateral Into Artery Trial.) Boehringer Ingelheim Pharmaceuticals, Ridgefield, CT
2001-2002	Data Safety and Monitoring Board. Clinical Study Protocol PCYC-0502 (Lutetium Tefaphyrin in PTA) Duke Clinical Research Institute, Durham, NC
2000-2001	Steering Committee. Lumaxis (Roxifiban) in PAD. DuPont Pharmaceuticals. Dover, Delaware
1999-2001	Co-National Principle Investigator and Steering Committee. Phase II Randomized, Multicenter, Double-Blind, Placebo-Controlled, Regimen Finding Study to Evaluate the Safety, Pharmacokinetics and Efficacy of Recombinant Fibroblast Growth Factor-2 (rFGF-2) in Subjects

with Stable Intermittent Claudication (IC) due to Peripheral Arterial Disease (TRAFFIC). Chiron Co. Emeryville, CA

Patents

US 9,845,465 B2, issued 12/19/17
Compositions and Methods for Treating Peripheral Arterial Disease
European Patent 2885008B, issued 11/7/2018

Company:

Merand Pharmaceuticals: Scientific Founder
Founder, Company formed late 2018,
$1.35M initial funding, $1.25M Series A/convertible note, Series B in progress
IND Approved for Phase 1a Study 9/2025

Advisory Boards

Prior Regular activity but not current for >36 months
AnGes Mg, Inc., Osaka, Japan (Scientific Advisor)
AstraZeneca, (Advisory Panels, member and chair)
Athresys, Cleveland, Ohio (Medical Advisor), not current
BioMet, Indianapolis Indiana (Scientific Advisor), not current
DNAVec Inc., Tokoyo, Japan (Scientific Advisor), not current
Celgene Cellular Therapeutics (Scientific Advisor), not current
Baxter Health Care Cell Therapy (Scientific Advisor), not current
Cardiovascular Biotherapeutics (Scientific Advisory Board), not current
2008 – 2009 Pluristem, Tel Aviv, Israel (SAB), not current
TheraVasc & SulfaGenix, Cleveland OH, (Scientific Advisor)

Selected Recent Talks since 2012– (2019 - 2023 not listed second to SARS-2 COVID-19)

Invitations in 2018	University of Miami Yale University Veith Symposium, New York, NY
Invitations in 2017 include:	Columbia University College Physician and Surgeons Cardiology Grand Rounds, New York, NY North American Vascular Biology; Vasculata Chicago, IL (@University of IL, Chicago) University of Texas McGovern Medical School at Houston, Institute of Molecular Medicine University of Texas, Medical Branch, Galveston, Tx, Department of Internal Medicine
Invitations in 2016 include:	Midwest Conference on Cell Therapy and Regenerative Medicine, U Kansas (September 2016) Albert Einstein College of Medicine/Montefiore Medical Center Medical Grand Rounds: Houston Methodist Hospital Medical Grand Rounds: Rutger's/Robert Wood Johnson College of Medicine
Invitations in 2015 include:	University of Maryland Experimental Biology (Boston, MA) Vasculata 2015. North America Vascular Biology Organization Feinstein Medical Research Institute, Manhasset NY Annual International Meeting: Houston Methodist Research Institute (Keynote Address)

Invitations in 2014 include: University of Pennsylvania (January 2014)
Oregon Health Sciences (April 2014) – Pepoon Visiting Professor
Midwest Conference on Cell Therapy and Regenerative Medicine, U Kansas (September 2014)

Invitations in 2013 include: Massachusetts General Hospital (January 2013)
Case Western Reserve (February 2013)
University of Wisconsin, Madison (September 2013)

Invitations in 2012 included: Emory University, Visiting Professor, Cardiology Research Day
Stanford University,

Selected International Talks

2022 Gordon Research Conference, Understanding Endothelial Cell Diversity: Regulation and Regenerative Potential, Barcelona, Spain, Session Chair

2018 Sun Yat-Zen University Affiliated Hospital, Shenzhen, China

2018 Guangzhou Medical University, Sino-American Symposium, Qingyuan People's Hospital, PAD in 2018

2014 Dalian Medical University, Dalian China, Update on Vascular Medicine

2012 University of Edinburgh: A Systems Biology Approach to Angiogenesis

2009 PAD 2009: TransAtlantic Vascular Medicine Meeting for updating TASC Document. Oreboro, Sweden. Therapeutic Angiogenesis in PAD

2006 Healing Science and Industry, St Thomas VI.
Cell Therapy for Peripheral Arterial Disease

2006 International Heart Foundation, Beijjing China. New Insights into the Pathogenesis and Treatment of Peripheral Arterial Disease

2006 Montreal Heart Center, Montreal CA. Angiogenesis and Stem Cells: Hype or Hope

2004 Wound Healing Science and Industry, St Thomas VI. Therapeutic Angiogenesis for Peripheral Arterial Disease

2004 European Society of Cardiology, Munich, Germany
Therapeutic Angiogenesis for Peripheral Arterial Disease: Endpoint Selection

2004 Frontiers in Cardiovascular Medicine Symposium, National University of Galway, Galway Ireland *Gene Therapy Approaches for Therapeutic Angiogenesis*

2003 2nd International Russell Ross Symposium, Ulm Germany.
Therapeutic Angiogenesis: Latest Update

Extramural Meetings (Organizational)

2015-present Planning Committee, Society Vascular Medicine and Biology

2015-2017 Planning Committee, 2016 & 2017 International Vascular Biology Meeting

March 2010 Program Co-Director
Keystone Scientific Symposium 3/1 – 3/5/2010, Keystone, CO
Angiogenesis and Myocardial Repair

November 2004 Course Co-Director, Satellite Symposium prior to Scientific Session of the American Heart Association, Orlando, FL.
Therapeutic Angiogenesis and Myogenesis

November 2003 Course Co-Director, Satellite Symposium prior to Scientific Session of the American Heart Association, Orlando, FL.
Clinical Trials in Therapeutic Angiogenesis and Cell Therapy

November 2002 Course Co-Director, Satellite Symposium prior to Scientific Session of the American Heart Association, Chicago, IL.
Therapeutic Angiogenesis and Myocardial Regeneration

June 2002 Course Director, Postgraduate Symposium in Association with the 14th Annual Scientific Sessions for the Society of Vascular Medicine and Biology
Therapeutic Angiogenesis for Peripheral Arterial Disease. Boston, MA

Clinical Duties

- **2008 to present**

CCU/Acute Card Cardiology/Cardiology Consultation 6-8 weeks per year

Research Interests

Peripheral Arterial Disease (Translational Research)
Angiogenesis/Vascular Remodeling,
Vascular Biology,
Systems Biology and Computational Modeling

Teaching responsibilities (UVA up to 2019 and MCG 2019-present):

1) Graduate Medical Education Committee for last 9 years.
2) Internal Medicine Residency Selection Committee, ad-hoc, last 9 years
3) NexGen Education, 2011 – 2013, oversight for the generation and planning of revamping of the School of Medicine Undergraduate Medical Education.
4) 2008 – 2019 All situations where cardiology services intersect with GME and UME.
5) 2019 - present all situations where medicine services intersect with GME and UME.

Grant Support – Award Initiation Pending

25CVDO-3 (U.S. Program Director, (PI), Leducq Foundataion, 1/1/2026 – 12/31/2030 "*Arteriogenesis in Translation"* ($272,320 total costs Year 1 including 15% indirect costs to Annex Lab)

Grant Support – Current

R01 HL164592-01A1, Gelfand BG = PI (UVA), Annex Co-I subcontract 4/1/2023 – 3/31/2027
"Mechanistic basis of sexual dimorphism in antigen-independent IgG1 angiogenesis regulation"
Understand sex as a biologic variable in peripheral arterial disease using pre-clinical models.

RO1HL169576-01 Faulkner J = PI (Augusta U), Annex Co-I subcontract 6/2023-4/2028
"*The Regulation and role of leptin in preeclampsia*"
Will provide review of data and input to the study PI, and her team, on the potential role of VEGFR1 in trophoblasts and leptin production.

1R01HL150003-01 (MPI: Annex/McClung) 01/01/2020 – 12/31/2024
NIH/NHLBI
"Clinical Phenotyping and Disease Specific Sampling to Identify Non-coding RNAs for Human Therapeutics in PAD"
Major Goal(s): We will identify micro-RNA and lncRNAs that are altered in ischemic muscle and in peripheral blood of patients with peripheral arterial disease (PAD) to determine how they contribute to the disease phenotype and whether they can be developed into biomarker for diagnosis of PAD. This project will identify the mechanisms of action of these new regulators of disease and open the door for future therapeutic strategies that use or manipulate the non-coding RNAs for treatment of PAD.
Role: Contact Principal Investigator

5R01HL148590-02 (PI: Annex) 08/16/2019 – 07/31/2024
NIH/NHLBI
"Precision Medicine for Therapeutic Angiogenesis in Peripheral Arterial Disease: Targeting of the IL21R Pathway"
Major Goal(s): This proposal will focus on human and targeted non-clinical studies on how the interleukin-21 receptor (IL21R) may be an unexpected but exciting "target" to try and treat patients with PAD. The aims are: Aim 1): To assess human therapeutic targeting establish whether: a single strategy for all patients, distinct strategies by PAD clinical subgroups, or fully personalized strategies allows optimal targeting of IL21R mediated hypoxia-dependent angiogenesis. Aim 2): In-vitro and in-vivo contrast IL21R to VEGF in hypoxia dependent angiogenesis. Aim 3) Determine whether miR-30b is necessary for IL21R mediated hypoxic angiogenesis and can serve as a therapeutic alternative to IL21R in PAD conditions.
Role: Principal Investigator

1 R01 HL141325-01A1 **Annex = PI,**
Kontos CD (Duke) Co-I and subcontract (100K/year)
1/2019 – 12/24 (extra time permitted for human subjects enrollment during SAR2-COVID 19)
Total direct costs $490,000/year
The Anti-angiogenic VEGF165b and VEGFR1 Signaling in Peripheral Artery Disease.
The overwhelming majority of pre-clinical studies in PAD have focused on VEGFR2 for therapeutic angiogenesis but human studies with this target have failed. If and the mechanisms by which VEGFR1 promotes hypoxia-dependent angiogenesis are poorly understood and vastly understudied compared to VEGFR2. Alternative splicing of VEGF-A results in a 6 amino acid switch that changes the pro-angiogenic $VEGF_{xxx}a$ (xxx = the number of amino acids) to the "anti-angiogenic" $VEGF_{xxx}b$ ($VEGF_{165}b$ for 165 amino acids) isoform.Of critical importance is our unexpected demonstration that the anti-angiogenic effects of the $VEGF_{xxx}b$ are directly linked to VEGFR1 signaling; a finding that may shift the paradigm of hypoxia-dependent angiogenesis in general and VEGFR signaling in PAD in particular. We pose that the anti-angiogenic effects of $VEGF_{165}b$ in hypoxia and PAD are mediated by inhibition of VEGFR1 signaling in both ECs and macrophages. Aim 1 will determine whether antibodymediated $VEGF_{165}b$ inhibition induces hypoxia-dependent angiogenesis via a distinct VEGFR1-dependent pathway. Aim 2 will determine the mechanisms by which $VEGF_{165}b$ promotes VEGFR1-mediated M1 macrophage polarization in mouse bone marrow derived macrophages (mBMDM) and human, peripheral blood mononuclear cells. Aim 3 will determine the VEGFR1-mediated signaling pathways that promote hypoxia-dependent angiogenesis in ECs and macrophages.

Recently Completed

1RO1 GM129074 Mac Gabhann (Hopkins=PI) Bautch (UNC) & Annex (UVA) Co-I
7/2018 – 6/2023
New Roles for VEGFR1 in Angiogenesis
This new application combines computational modeling (Mac Gabhann), with cell culture (Bautch), and in-vivo models (Annex) examining the role of VEGFR1 signaling in angiogenesis.
Subcontract approximately $175,000/yr. direct costs

3R01 HL101200 (Popel, Hopkins) 04/13/2010 – 3/31/2024 NHLBI
NIH/NHLBI, Annex laboratory sub-conbtract direct costs $240,000/year
"Systems Biology of Angiogenesis in Peripheral Arterial Disease"
Competitive Renewal submitted June 2018, reviewed October 2018 and received 3rd percentile
The broad goal of the project is to gain a quantitative knowledge and understanding of angiogenesis in PAD, using a highly synergistic combination of predictive multiscale computational modeling and in vivo experiments; further, using this knowledge, to design improved and novel human therapeutics.
Subcontract approximately $175,000/yr. direct costs

Grants – Completed
1 RO1 HL 121635-01A1 Annex = PI 7/2014 – 6/2019. NHLBI
$250,000/year direct costs
The Role of miR-93 in Peripheral Arterial Disease
This proposal will determine the role that miR-93 can play as a potential therapeutic in patients with PAD. Having already shown the effects of gain and loss of function of miR93 in pre-clinical models of PAD, in the first aim we will determine the precise processes that alterations in miR93 play on angiogenesis, arteriogenesis by magnetic resonance imaging, and on the progenitor cell response. We will employ unique genetic models as well. In aim 2 we will determine how generalizable the effects of miR93 using analyses of cell and condition specificity. Finally, aim 3 will build on exciting preliminary data on the potential role that miR93 plays in humans with PAD, focusing on three specific questions.

1R01 HL116455-A1 Annex, BH (contact) & French BA Multiple PI 5/2014 – 4/2019
NIH/NHLBI $380,000/year direct costs (including subcontract to Yale University)
A Bioengineering Approach to Gene Therapy for Peripheral Arterial Disease
The specific aims of this grant is: 1. Determine whether the enhanced gene expression in ischemic skeletal muscle following systemic delivery is "unique" to AAV9 using reporter genes to facilitate quantitative bio-distribution studies of gene with AAV serotypes 2, 6, 8 and 9; 2: Establish the mechanisms(s) of enhanced gene expression in ischemic muscle seen following systemic AAV gene transfer and determine if the(se) mechanism are active in humans with PAD; 3: Determine whether myocyte directed AAV therapy can be associated with therapeutic benefit following systemic deliver. Thus, we will employ two PAD models where therapeutic targeting of the endothelium will be less effective to evaluate the effects of systemic AAV.

3R01 HL075792-10 PI = Kramer, CM NHLBI 7/09 – 6/19
Comprehensive Magnetic Resonance in PAD
Measuring calf muscle blood flow reserve at peak exercise relative to rest flow may be more powerful than exercise flow alone. Quantification of muscle blood flow and flow reserve without the use of contrast would be desirable when PAD patients are disqualified from the use of contrast due to underlying renal dysfunction. Specific Aim #1 is to develop and test MRI methods to quantify skeletal muscle blood flow and flow reserve at peak exercise in peripheral arterial disease, both with and without a contrast agent. Specific Aim #2 is to test the ability of peak exercise measures of calf muscle perfusion reserve and energetics to detect changes in PAD patients after percutaneous revascularization.

Co-Investigator
Overlap – None

R01 HL120930 (DeBoer, M Gurka, M MPI) 08/2014 – 04/2019 Co-investigator
NIH/NHLBI
An Ethnicity-Specific MetS Severity Score to Assess Risk: The Jackson Heart Study
Goals of Project: 1. Characterize the epidemiology of MetS in African-Americans with respect to lifestyle and other disease factors and evaluate how these contribute to longitudinal changes in MetS severity; 2. Examine the association between MetS severity and the future development of coronary heart disease (CHD), stroke and T2DM in African-Americans; 3. Examine the association between MetS severity and the future development of chronic kidney disease (CKD) in African-Americans.

Daiichi Pharmaceuticals (Annex = PI) 2/2016 – 2018
$1M
MicroRNA's in PAD
An industry award to identify novel micro-RNA targets for PAD.

2 RO1 EB1763-09A1 Epstein FH PI 7/1/2013 – 6/2019
MRI in mouse models of heart disease
This will access novel imaging methods for myocardial blood flow using the high-fat diet model. My laboratory will provide expertise on measurements of capillary density to compliment the non-invasive imaging methods.
Role: Co-Investigator

1UH3TR000959-01 Annex = PI 7/2013 – 9/2016 Direct costs $387,000/yr
NCATS/NIH
Reuse of ZD4054 (zibotentan):patients with symptomatic PAD
This is a clinical grant to test the ability of a "repurposed" endothelin antagonist to modulate calf muscle perfusion and functional performance in patients with peripheral arterial disease, particularly intermittent claudication.
Overlap - None

1RHL122721A1 Popel (Johns Hopkins=PI), Annex sub-contract 7/2014-9/2016
Bioinformatic analysis of molecular networks in peripheral artery disease
Specific Aim 1. To perform a comprehensive bioinformatic comparative analysis of existing human and mouse microarray data across different samples and forms of PAD. The arrays will be analyzed and the output from these computational comparisons will be made in context-appropriate human samples.
Specific Aim 2. The analysis used to generate candidates in Aim 1 will be performed with a filter that focuses on networks from drug repositioning to identify a novel strategy for treating PAD.

MedImmune (Annex = PI) 9/2015 – 8/2016
$180,000 direct costs
Modified VEGF mRNA in PAD
An industry award to study a modified VEGF mRNA in pre-clinical PAD models.

1R21HL111972 (Allen PI, Duke University) 02/01/2012 – 01/31/2015 (in ext)
Increased Plasma Nitrite, Tissue Oxygenation and Functional Changes in PAD
To determine differences in gastrocenemius muscle (via biopsy) (a) angiogenesis and arteriogenesis (capillary density with surrounding pericytes, proliferating cell nuclear antigen, and apoptosis) and oxidative capacity (fiber type composition, citrate synthase activity), and (b) endothelial function (brachial artery FMD) after SET or PET.
Overlap – None

Role: PI of subcontract to UVa

1R21HL113717 (Allen PI Duke University) 02/01/2013-01/31/2015 (in ext)
NIH Dietary Nitrate to Augment Exercise Training Benefits in DM+PAD
Overlap – None
Role: PI of subcontract to UVa
Dr. Annex will serve as an advisor for the clinical study and his laboratory will analyze human muscle biopsies obtained by the PI at Duke University.

12GRNT12040223 (French, B PI) 07/01/2012 – 06/30/2014
American Heart Association
EcSOD Gene Medicine for Treating Peripheral Arterial Disease by Intravenous Administration
Role: Co-Investigator
Overlap - None

1R01 HL101200-S1 (Popel, Hopkins)
Minority Supplement – Ayotunde Dokun 09/01/2010 – 08/31/2013
PI: Brian Annex, MD $85,000/current yr directs

65874 PI = Dokun and Mentor = Annex 7/09 – 6/13
Robert Wood Johnson Foundation
Harold Amos Medical Faculty Development Program
"Genetics of Peripheral Arterial Disease"
Ayotunde Dokun completed his fellowship in Endocrinology at Duke and was recruited to UVA

1UO1 DK076136 (Coffman) 09/2006 – 6/30/2013 (NCE)
NIH/NIDDK 72 CM/$72,747/current yr directs
UVA Subcontract Annex = PI
"Angiogenic Signals in Diabetic Complications" (AMDCC)
1. To develop mouse models with genetic modifications of key signaling pathways linked to angiogenesis. 2. To determine the effects of diabetes on angiogenic signaling in a well-established model of peripheral artery disease. 3. To define the consequences of altered angiogenic signaling on the development of albuminuria and nephropathy in diabetes.

RO1 HL077523 PI = Annex NHLBI 4/05 – 3/11
"Skeletal Muscle Plasticity Following LVAD Support"
Establish that alterations in changes in central hemodynamics are sufficient to induce changes in peripheral skeletal muscle in patients with congestive heart failure (CHF). Establish the extent, type, and time course, of peripheral skeletal muscle plasticity pre-LVAD to 9-weeks post-LVAD support. Examine potential circulating mediators before, and at serial time points after, LVAD and changes in rectus abdominus muscle pre-LVAD to heart transplantation, using selected measures and compare those to changes in leg muscle over a comparable time period.

1R33 HL088286 PI (Johns Hopkins) = Poppel NHLBI 10/06 – 9/10
PI (UVA) = Annex
"Systems Biology for Angiogenesis: from Molecules to Therapy
1. Construct and experimentally validate integrative multi-scale computational models of VEGF ligand-receptor interactions and signaling to simulate in vivo conditions in skeletal muscle.
2. Using the computational models, design pro-angiogenic therapeutic strategies that are predicted to optimize VEGF receptor activation and downstream signaling in diabetic mice, and experimentally test these strategies.
3. Apply the computational models to human muscle and predict angiogenic responses in diabetic and non-diabetic humans with PAD. Compare results of ongoing and previous

clinical trials with computational predictions and apply this knowledge to design of improved or novel therapeutic interventions.

1-08-CR-03 PI = Annex American Diabetes Association 1/08 – 12/10
"AMNESTI II PAD and Diabetes"
The major goals of the this clinical research project is to explore the role that diabetes plays in the response to exercise in patients with peripheral arterial disease. This proposal will examine the beneficial effects of exercise training in patients with PAD and DM at 3 weeks will be greater then the effect observed in patients PAD alone. In addition, these beneficial effects are mediated by peripheral alterations distinct to the metabolic state of the ischemic muscle in DM. Moreover, we will establish whether the clinically relevant differences in training effect remain at 12 weeks; a finding that could be used to suggest that supervised exercise may be best suited for patients with PAD plus DM and potentially reveal that exercise training in subjects with PAD and DM reduces measures of morbidity/mortality, is more cost effective than medical treatment alone and prevents disease progression and interventions.

RO1 HL075752 PI = Annex NHLBI 09/03 – 8/10
"Angiogenesis and Mechanisms of Exercise Training in PAD"
The major goals of this clinical research study are to understand the mechanisms that underlay the response of patients with peripheral arterial disease to exercise training. The specific aims are: 1) Establish the baseline vascular abnormalities present in patients with PAD compared with controls in order to provide the appropriate context to understand the changes induced by exercise training. 2) Determine the predictive index of vascular abnormalities evaluated in Specific Ami 1 to predict peak oxygen consumption in patients with PAD. 3) Establish the ability of exercise training to modify the vascular abnormalities in PAD by examining the changes in measures made in Specific Aim 1. B) Establish the association between the changes in vascular abnormalities with objective (i.e. maximal and pain-free walking times on treadmill testing) and patient perceived outcomes (quality of life measures) of exercise training. 4) Determine the underlying gender specificity of the results obtained in Specific Aims 1.

RO1 DK62297 PI = Annex NIDDK 01/04 – 08/09
R56 DK62297-06 PI = Annex NIDDK 09/09 – 08/10

"Therapeutic Angiogenesis for Erectile Dysfunction"
The major goals of this program are to explore the mechanisms of the vascular injury that causes abnormalities in vasoreactivity which is the major etiology of erectile dysfunction and the specific aims of this pre-clinical project are: 1) In an established pre-clinical model of atherosclerosis, correlate changes in vascular endothelial growth factor protein expression with the development of histological (i.e. loss of endothelial and vascular smooth muscle content) and vasoreactivity abnormalities (i.e. endothelial dependent and endothelial independent relaxation) in corporal tissue. 2) In the presence of abnormalities in histology and vasoreactivity in corporal tissue induced by cholesterol feeding, establish that exogenous VEGF leads to increases in VEGF signaling activity that precede the beneficial changes in histology and vasoreactivity. Establish that the late beneficial changes in corporal tissue histology and vasoreactivity that follow exogenous VEGF therapy are correlated with increases in VEGF expression. Establish whether the exogenous administration of bFGF results in similar changes in histology, vasoreactivity, and VEGF signaling activity as VEGF administration. 3) Establish the ligand-receptor interactions for VEGF that are responsible for the therapeutic modulation of histology and vasoreactivity in corporal tissue. Establish that therapy with bFGF requires VEGF in order to exert its beneficial effects on histology and vasoreactivity.

R01HL57354 PI = Kraus NHLBI 4/04-3/09
"Peripheral Effects of Exercise on Cardiovascular Health"

The aims of this proposal are to investigate the hypothesis that the beneficial effects of exercise training on cardiovascular risk factors are mediated through adaptations in skeletal muscle; specifically, through changes in capillary density. This proposal includes skeletal muscle biopsies of skeletal muscles from normal subjects undergoing one of four exercise training regimens. However, studies of regulation of gene expression in human skeletal muscle biopsies are not included as a part of this proposal, but analyses of gene expression in the muscle biopsies are left as part of the current application.
Co-Investigator with Direct costs to Dr. Annex approximately $30,000/year

R01CA098637 PI = Gilboa NCI 7/1/03-6/30/08
"Cancer Immunotherapy Targeting Endothelial Antigens"
The objective of this grant is to develop an anti-angiogenic treatment modality for cancer by immunization against angiogenesis associated products, which are preferentially expressed during angiogenesis.
Co-Investigator 5% effort, no laboratory support.

R01HL063346 PI = Taylor NHLBI 8/04-7/09
"Safety and Efficacy of Cellular Cardiomyoplasty
The major goals of this project are to determine and promote the longevity of myoblast (versus non-contractile cell) survival and function in a rabbit model of cryoinjured heart. Determine electrical, mechanical or cytokine factors which may contribute to or result from ultrastructural changes seen in skeletal myoblasts after transplantation into injured heart. Determine the extent to which myoblasts isolated from control animals, animals after an acute myocardial infarction, or in animals with end-stage heart failure.
Co-Investigator 5% effort, no laboratory support.

01/01 – 12/05 $68,5000/year direct costs
American Heart Association – Established Investigator #EI 0140126N
"Physiologic and Pathologic Angiogenesis and Vascular Rarefaction in Peripheral Skeletal Muscle"
Principal Investigator

1/1/05 – 12/31/06
Iacocca Foundation
"Therapeutic Angiogenesis and Diabetis Mellitus"
Investigate the influence that diabetes mellitus has on therapeutic angiogenesis in pre-clinical models of peripheral arterial obstructive disease.
PI = Annex

7/1/02 - 6/30/05 $33,000 Direct Costs Year 1
Agency: NIH(NIA) - Consortium Agreement with Wake Forest University Pepper Center
"In Vitro Mechanistic Studies of Skeletal Muscle Function"
PI: Kraus - 1% effort; Co-Invest: Annex - 1% effort

04/00 – 03/05 $112,300 Direct Costs, Year 2 -5
Veterans Administration Merit Review MIRB # 00253
"Vascular Density & Skeletal Muscle Abnormalities in CHF"
Principal Investigator (30% effort)
10/00 – 04/05 $183,622 Direct Costs
NIH – R01 HL63703-01A1
"Augmenting Myocardial Regeneration Through Angiogenesis"
Co-Investigator (5% effort) – (Doris A. Taylor, M.D., Principal Investigator)

7/98 – 8/03 ($108,030, Year 1)
NIH – R01 HL57354

"Peripheral Effects of Exercise on Cardiovascular Health"
Co-Investigator (10% University effort) (William E. Kraus, M.D., Principal Investigator)

04/00 – 11/02 ($28,991, Year 1)
Boston Scientific Corporation, Natick, MA
"Localized Delivery of Genetic Growth Factors"
Principal Investigator (1% effort)

1/01 –12/02 ($437,000)
Gencell (Aventis), Paris, France
"Efficacy of Direct Intramyocardial Delivery of VFGF-B in Increasing Myocardial Blood Flow, Improving Contractility, and Promoting Angiogenesis in Chronic Ischemic Porcine Myocardium"
Co-Principal Investigator (5% effort), (Kevin P. Landolfo, M.D., PI)

4/98 - 6/00 ($23,000 VA / $83,281 Duke)
Chiron Corp./G.D. Searle & Co.
"Application of rTFPI to Reduce the Intimal Thickening in Porcine Vein Grafts"
Principal Investigator (10% University/5% total effort)

1/99 – 12/99 ($201,185)
NIH-NHLBI; 5-P50-HL54314-05 - SCOR in Heart Failure
"Exercise Intolerance in Heart Failure: Peripheral Factors and Exercise Training"
Project I - Principal Investigator: William E. Kraus, M.D.
Co-Principle Investigator Project I (30% University effort): Gary L. Stiles, M.D., Director

7/98 – 9/99 ($274,000)
Genentech Inc., South San Francisco, CA
"Optimization of Intravenous Dosing Regimen and Duration of Effect of Vascular Endothelial Growth Factor (VEGF) in Increasing Myocardial Blood Flow, Improving Contractility, and Promoting Angiogenesis in Chronic Ischemic Porcine Myocardium"
Principal Investigator (5% effort) (Kevin P. Landolfo, M.D., Co-PI)

3/98 – 4/99 ($200,000)
Chiron Corporation, Emoryville, CA
"Efficacy of Direct Intramyocardial Delivery of Basic Fibroblast Growth Factor in Increasing Myocardial Blood Flow, Improving Contractility, and Promoting Angiogenesis in Chronic Ischemic Porcine Myocardium"
Principal Investigator (5% effort) (Kevin P. Landolfo, M.D., Co-PI)

1/98 - 12/99 ($15,000) Direct Costs Only
Durham VA Institute of Medical Research In-House Grant
"The Role of Angiogenesis in Skeletal Muscle Adaptability"
Principal Investigator (10% VA/5% total effort)

7/96 - 6/98 ($55,000) Direct Costs Only
American Heart Association-North Carolina Affiliate NC-96-GS-61
"Tissue Factor and Thrombin Inhibition in Experimental Venous Bypass Grafting"
Principal Investigator

1/98 - 12/98 ($28,000)
Chiron Corp./G.D. Searle & Co.
"A Follow-Up Study on the Feasability of Local Delivery of rTFPI in Experimental Venous Bypass Grafting" Principal Investigator

7/96 - 6/97 ($25,000)
Chiron Corporation, G.D. Searle & Company
“Local Delivery of rTFPI and the Effects on Initial Hyperplasia in Experimental Venous Bypass Grafting” Principal Investigator

11/96 - 10/98 ($7,500) Direct Costs only
Duke University Medical Center Small Research Grants Committee, Madison Spach, M.D., Chairman
“Angiogenesis in Atherosclerosis” - Principal Investigator

7/94 - 6/95 ($30,000) Direct costs only
Duke Heart Center
"The Molecular and Cellular Features of Human and Experimental Vein Graft Atherosclerosis" Principal Investigator

<u>Clinical/Industry Grants – Completed</u>
2/99 – 6/01
FDA IND #8342
“Phase II Randomized, Multicenter, Double-Blind, Placebo-Controlled, Regimen Finding Study to Evaluate the Safety, Pharmacokinetics and Efficacy of Recombinant Fibroblast Growth Factor-2 (rFGF-2) in Subjects with Stable Intermittent Claudication (IC) due to Peripheral Arterial Disease”
Sponsor: Chiron Corporation
Coordinating Center: Duke Clinical Research Institute
National Principle Investigator (30% effort)

10/98 – 2/00 Clinical Grant/No Lab. Support
Chiron Corp., Emoryville, CA
“Phase II, Multicenter, Double-Blind, Placebo-Controlled, Dose Finding Study for Safety, Pharmacokinetics and Efficacy of Recombinant Fibroblast Growth Factor-2 (rFGF-2) in Subjects with Coronary Artery Disease (CAD)”
Site Principal Investigator: Duke University and Durham VA Medical Center

05/98 – Completion 2 Clinical Grants/No Lab. Support
Vascular Genetics Inc., Research Triangle Park, NC
“A Randomized, Double-Blind, Placebo-Controlled, Dose-Escalating Study of Intramuscular Vascular Endothelial Growth Factor 2 (VEGF-2) Gene Therapy in Patients with Moderate-Risk Critical Limb Ischemia (VEGF2-PAD-CL-004)”
Ibid: High Risk Critical Limb Ischemia (VEGF-2-PAD-CL008)
Site Principal Investigator: Duke University and Durham VA Medical Center

7/97 - 3/98 Clinical Grant/No Lab. Support
Genentech, Inc., South San Francisco, CA
“A Phase I, Open Label, Multicenter, Dose-Escalation Study to Assess the Safety, Tolerability, and Pharmacokinetics of Multiple Intravenous Administrations of rhVEGF in Adults with Viable but Underperfused Myocardium” - Site Principal Investigator

11/97-2/99 Clinical Grant/No Lab. Support
Interventional Technologies - VA IMR Office (clinical study - 11/97)
“TEC Before Stent (TECBEST II)” - Site Principal Investigator

4/98 - Completion Clinical Grant/No Lab. Support
Genentech, Inc., South San Francisco, CA

"A Phase II, Double-Blind, Placebo-Controlled Study to Assess the Effect of Intracoronary and Multiple Intravenous Administrations of rhVEGF on Exercise Tolerance in Adults with Viable but Underperfused Myocardium"
Site Principal Investigator: Duke University Medical Center and Durham VA Medical Center

SELECTED PRIOR (UNTIL 2019) and CURRENT TRAINEES

Trainees prior to 2007 include individuals on the faculty at Johns Hopkins University and a tenured investigator at the NIH.

Trainee Name	Training Period	Current Position/Funding if appropriate
W. Schuyler Jones, M.D.	7/2006 – 6/2008	Funded T32 Training Grant Director Cardiac Catheterization Lab Professor of Medicine Duke University School of Medicine
Daniel R. Guerra, M.D.	7/2006 – 6/2008	Support, NIH Minority Supplement to RO1 Clinical Assistant Professor of Medicine U Washington
Ayotunde O. Dokun,	7/2006 – 6/2008 7/2010 – 2013	Funded on T32 training grant '06 – '08 Funded 1) Robert Wood Johnson Faculty Development Grant 2) NIH Minority Supplement to RO1 Current Position, Chief Division of Endocrinology at University of Iowa
Arbin B. Katwal, M.D.	7/2009 – 6/2011 (went on to clinical cardiology training at UVA, 2011-2013)	Completed Interventional Cardiology Fellowship @ Loyola U. Chicago, IL Funded T32 HL073555
Surovi Hazarika M.D., Ph.D	7/2011 – 1/2013 (went on to clinical cardiology training at UVA)	Cardiology Fellow, UVA, complete 6/2015 AHA Scientist Dev. Grant submitted 1/2015 1.3 percentile funded as of 7/1/2015 KO8 6/2016 Previously Funded T32 HL007284 Faculty, Cleveland Clinic
Tao Wang Ph.D	7/2012 – 2017	Associate Professor Guangzhoa Medical University Four - first author manuscripts
Vijay Ganta Ph.D	2013 – 2019	AHA Scientist Dev. Grant Awarded 7/2016 RO1 funded 2019. Assistant Professor of Medicine, Augusta University
Alexis Peterson, Ph.D.	2014 – 2016	Obtained PhD.in Neuroscience from UVA Funded T32 HL007284 Scientist, Centers for Disease Control

Joshua Heuslein, Ph.D.	2016 – 2019	Obtained PhD. In BME from UVA Funded T32 HL007284
Monique Bethel, M.D.	2020 – 2022	Research electives as Cardiology Fellow Recruited onto faculty. Institutional training grant.
Suhib Alhusban, Ph.D. candidate	2019- present	
Anita Kasa-Kovacs, Ph.D.	2020 – present	Started Post-doctoral, Augusta University Research Scientist, Augusta University American Heart Association Scientist Development Grant funded 2021.
Currently in laboratory:	Two internal medicine trainees on the research track, Four medical students,	

Other selected past mentoring activity

1) Mentor for Ellen C. Keeley, M.D.'s (Interventional Cardiology Faculty) NIH K23 during years 2009 – 2013. The project was on role of chemokines and angiogenesis
2) Mentor for Saroosh Kiani, M.D. July 1, 2013 to June 30, 2014, he was the sole PGY2 medical resident chosen for "clinical investigator track from internal medicine program. He is now on faculty at Emory in Cardiology
3) Jeongok Logan, R.N., Ph.D.(faculty member in School of Nursing) -- K23 funded as of 5/2016 Annex (Primary Mentor)

Selected undergraduate students graduated from UVA (listing last contact information)

1) Oksana Chernushevich – currently in grad school at Virginia Tech
2) Caitlin Azzarello –BME undergraduate was enrolled in Capstone Program, went to physicians' assistant (Roanoke)
3) Alexander Newton – left for Podiatry School
4) Sean Li – left for med school at VCU
5) Eric Mulkey – left for med school,
6) Dawit Ayalew – left for Master's Program at Georgetown
7) Min (Michael) Choi –medical student at Thomas Jefferson School of Medicine, now surgical resident in at Washington Hospital Center.

Selected prior undergraduates from outside UVA

1) Carlos Barbery - worked during summer in a program designed to expose undergraduates to medical profession and again during 4th year of medical school at Thomas Jefferson School of Medicine. Started as Medical Intern at Duke University July 2018.
2) Tyler Beckler – completing medical school
3) Natasha Duggan – joined laboratory after college graduation. Just received PhD Microbiology at University of Miami. Now a Post-Doc Scripps

M.D., Ph.D. students: Dan Hess working between Dr. Gary Owens and my laboratory. Graduated and is a medical resident at University of Alabama Birmingham

Ph.D. Committees:

Averaged 1 committee per year for UVA BME graduate student.
Typically one/two PhD. Committees/year for BME students at Johns Hopkins University

Grant Success of Recent Trainees who transitioned to faculty:

Anita Kovacs-Kasa Ph.D.	AHA SDG funded 7/1/2022
Leonguk Logan RN, PhD.	K23 Funded 4/2016, Annex = Primary Mentor
Ayotunde O. Dokun, M.D., PhD.	RO1 funded 2016
Vijay Ganta, PhD.	American Heart Association, Scientist Development Grant funded June 2016 RO1 funded 2018
Surovi Hazarika, M.D. PhD	American Heart Association, Scientist Development Grant funded June 2015, KO8 funded July, 2016

PUBLICATIONS (Manuscripts):

Annex, BH

http://scholar.google.com/citations?hl=en&user=bsotxTgAAAAJ&view_op=list_works&is_public_preview=1

h-index = 70,

Complete List of Published Work in https:/www.ncbi.nlm.nih.gov/pubmed/?term=annex+bh will list 192 publications. https:/www.ncbi.nlm.nih.gov/pubmed/?term=annex+b will yield 6 additional manuscripts.

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