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2018-2019 Department of Internal Medicine Scholarly Activity Report

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**EAST TENNESSEE STATE UNIVERSITY
QUILLEN COLLEGE OF MEDICINE**

SUMMARY OF SCHOLARLY ACTIVITIES

Department of Internal Medicine

July 2018 - June 2019

I. PUBLICATIONS

Journal Publications

Bah I, Kumbhare A, Nguyen L, McCall CE, El Gazzar M. IL-10 induces an immune repressor pathway in sepsis by promoting S100A9 nuclear localization and MDSC development. *Cell Immunol*. 2018 Oct;332:32-38. doi: 10.1016/j.cellimm.2018.07.003. Epub 2018 Jul 11. PMID: 30025864

Bhogal S, Khraisha O, Al Madani M, Treece J, Baumrucker S, Paul TK. Emergence of sildenafil as a treatment of pulmonary arterial hypertension and its role as a palliative therapy. *Am J Ther*. 2019 Mar 29. doi: 10.1097/MJT.0000000000000766. [Epub ahead of print] PMID: 30946047

Bhogal S, Mukherjee D, Bagai J, Truong HT, Panchal HB, Murtaza G, Zaman M, Sachdeva R, Paul TK. Bivalirudin versus Heparin during intervention in Acute Coronary Syndrome: A Systematic Review of Randomized Trials. *Cardiovasc Hematol Disord Drug Targets*. 2019 Jun 26. doi: 10.2174/1871529X19666190626124057. [Epub ahead of print] PMID: 31241442

Bhogal S, Panchal HB, Bagai J, Banerjee S, Brilakis ES, Mukherjee D, Kumar G, Shanmugasundaram M, Paul TK. Drug eluting versus bare metal stents in saphenous vein graft intervention: An updated comprehensive meta-analysis of randomized trials. *Cardiovasc Revasc Med*. 2018 Nov 22. pii: S1553-8389(18)30528-1. doi: 10.1016/j.carrev.2018.11.013. [Epub ahead of print] PMID: 30503811

Bibb LA, Winter RP, Leicht SS. Cyclosporine-induced Erythromelalgia. *Cureus*. 2018 Oct 27;10(10):e3506. doi: 10.7759/cureus.3506. PMID: 30648046

Cao D, Zhao J, Nguyen LN, Nguyen LNT, Khanal S, Dang X, Schank M, Chand Thakuri BK, Wu XY, Morrison ZD, El Gazzar M, Zou Y, Ning S, Wang L, Moorman JP, Yao ZQ. Disruption of Telomere Integrity and DNA Repair Machineries by KML001 Induces T Cell Senescence, Apoptosis, and Cellular Dysfunctions. *Front Immunol*. 2019 May 22;10:1152. doi: 10.3389/fimmu.2019.01152. eCollection 2019. PMID: 31191531

Chakraborty K, Krishnan S, Joy M. Antioxidative oxygenated terpenoids with bioactivities against pro-inflammatory inducible enzymes from Indian squid, *Uroteuthis (Photololigo) duvaucelii*. *Nat Prod Res*. 2019 May 28:1-12. doi: 10.1080/14786419.2019.1610957. [Epub ahead of print] PMID: 31135235

Dai J, Kumbhare A, Williams DA, Youssef D, Yao ZQ, McCall CE, El Gazzar M. Nfia deletion in myeloid cells blocks expansion of myeloid-derived suppressor cells during sepsis. *Innate Immun*. 2018 Jan;24(1):54-65. doi: 10.1177/1753425917742956. Epub 2017 Nov 27. PMID: 29172874

Ji Y, Dang X, Nguyen LNT, Nguyen LN, Zhao J, Cao D, Khanal S, Schank M, Wu XY, Morrison ZD, Zou Y, El Gazzar M, Ning S, Wang L, Moorman JP, Yao ZQ. Topological DNA damage, telomere attrition and T cell senescence during chronic viral infections. *Immun*

Ageing. 2019 Jun 24;16:12. doi: 10.1186/s12979-019-0153-z. eCollection 2019. PMID: 31285747

Khalid M, Khattak F, Ramu V. Cardiovascular Side Effects of Tyrosine Kinase Inhibitor Ibrutinib (Imbruvica) and Interaction With Direct Oral Anticoagulant. *Am J Ther.* 2018 Nov/Dec;25(6):e768-e769. doi: 10.1097/MJT.0000000000000775. No abstract available. PMID: 29916856

Khalid MF, Khan AA, Khattak F, Ayub MT, Bagai J, Mukherjee D, Helton T, Cohen MG, Banerjee S, Paul TK. Culprit vessel only versus multivessel percutaneous coronary intervention in acute myocardial infarction with cardiogenic shock: A systematic review and meta-analysis. *Cardiovasc Revasc Med.* 2018 Dec 21. pii: S1553-8389(18)30618-3. doi: 10.1016/j.carrev.2018.12.015. [Epub ahead of print] PMID:30638891.

Khalid MF, Nukavarapu M, Shah R., Paul TK. Rare case of a kidney and inferior vena cava abnormalities with extensive lower extremity deep vein thrombosis in a young healthy male. *Clin Pract.* 2018 Oct 26;8(4):1079. doi: 10.4081/cp.2018.1079. eCollection 2018 Oct 26. PMID: 30555668

Khan AA, Panchal H; Zaidi SM, Papireddy M, Mukherjee D, Cohen MG, Banerjee S, Rao S, Pancholy S, Paul TK. Safety and Efficacy of Radial versus Femoral Access for Rotational Atherectomy: A Systematic Review and Meta-Analysis. *Cardiovasc Revasc Med* 2018. *Cardiovasc Revasc Med.* 2018 Jun 11. pii: S1553-8389(18)30250-1. PMID: 30030065

Khattak F, Khalid M, Gaddam S, Ramu V, Brahmbhatt V. A Rare Case of Complete Fragmentation of Pacemaker Lead after a High-Velocity Theme Park Ride. *Case Rep Cardiol.* 2018 Oct 18;2018:4192964. doi: 10.1155/2018/4192964. eCollection 2018. PMID: 30498603

Kou J, Musich PR, Staal B, Kang L, Qin Y, Yao ZQ, Zhang B, Wu W, Tam A, Huang A, Hao HX, Vande Woude GF, Xie Q. Differential responses of MET activations to MET kinase inhibitor and neutralizing antibody..PMID:30208970 *J Transl Med.* 2018 Sep 12;16(1):253. doi: 10.1186/s12967-018-1628-y.

Krishnan S, Chakraborty K, Joy M. First report of chromenyl derivatives from spineless marine cuttlefish *Sepiella inermis*: Prospective antihyperglycemic agents attenuate serine protease dipeptidyl peptidase-IV. *J Food Biochem.* 2019 May;43(5):e12824. doi: 10.1111/jfbc.12824. Epub 2019 Mar 13. PMID: 31353519

Lewis PO, Lanier CG, Patel PD, Krolikowski WD, Krolikowski MA. False negative diagnostic errors with polymerase chain reaction for the detection of cryptococcal meningoencephalitis. *Med Mycol.* 2019 Jun 18. pii: myz064. doi: 10.1093/mmy/myz064. [Epub ahead of print] PMID: 31212317

Lewis PO, Sevinsky RE, Patel PD, Krolikowski MR, Cluck DB. Vancomycin plus nafcillin salvage for the treatment of persistent methicillin-resistant *Staphylococcus aureus* bacteremia following daptomycin failure: a case report and literature review. *Ther Adv Infect Dis.* 2018 Sep 10;6:2049936118797404. doi: 10.1177/2049936118797404. eCollection 2019 Jan-Dec. PMID: 30891239

Manthri S, Chakraborty K. Acute parvovirus B19 infection diagnosed by bone marrow biopsy. *BMJ Case Rep.* 2019 May 6;12(5). pii: e230403. doi: 10.1136/bcr-2019-230403. No abstract available. PMID: 31061202

McPeak MB, Youssef D, Williams DA, Pritchett C, Yao ZQ, McCall CE, El Gazzar M. "Myeloid Cell-Specific Knockout of NFI-A Improves Sepsis Survival". *Infect Immun*. 2018 Feb 20;86(3). pii: e00820-17. doi: 10.1128/IAI.00820-17. Print 2018 Mar. No abstract PMID:29463685

Moorman JP, Krolkowski MR, Mathis SM, Pack RP. HIV/HCV Co-infection: Burden of Disease and Care Strategies in Appalachia. *Curr HIV/AIDS Rep*. 2018 Aug;15(4):308-314. doi: 10.1007/s11904-018-0404-1. Review. PMID: 29931466

Murtaza G, Virk HUH, Khalid M, Lavie CJ, Ventura H, Mukherjee D, Ramu V, Bhogal S, Kumar G, Shanmugasundaram M, Paul TK. Diabetic cardiomyopathy - A comprehensive updated review. *Prog Cardiovasc Dis*. 2019 Mar 25. pii: S0033-0620(19)30051-9. doi: 10.1016/j.pcad.2019.03.003. [Epub ahead of print] Review. PMID: 30922976

Nguyen KPL, Pai V, Rashid S, Treece J, Moulton M, Baumrucker SJ. Prognostication in Anoxic Brain Injury. *Am J Hosp Palliat Care*. 2018 Nov;35(11):1446-1455. doi: 10.1177/1049909118767881. Epub 2018 Apr 3. Review. PMID: 29614864

Nguyen LN, Zhao J, Cao D, Dang X, Wang L, Lian J, Zhang Y, Jia Z, Wu XY, Morrison Z, Xie Q, Ji Y, Zhang Z, El Gazzar M, Ning S, Moorman JP, Yao ZQ. Inhibition of TRF2 accelerates telomere attrition and DNA damage in naïve CD4 T cells during HCV infection. *Cell Death Dis*. 2018 Sep 5;9(9):900. doi: 10.1038/s41419-018-0897-y. PMID: 30185784

ShIPLEY LC, Taylor ST, Grimsley C, Stoffer K, Goldstein J. Rats! Hantavirus: A Case Report of a Suspected Case in Eastern Tennessee. *Perm J*. 2018 Jul 19;22:17-222. doi: 10.7812/TPP/17-222. PMID: 30010530

Sitwala P, Khalid MF, Khattak F, Bagai J, Bhogal S, Ladia V, Mukherjee D, Daggubati R, Paul TK. Percutaneous closure of patent foramen ovale in patients with cryptogenic stroke - An updated comprehensive meta-analysis. *Cardiovasc Revasc Med*. 2018 Sep 19. pii: S1553-8389(18)30412-3. doi: 10.1016/j.carrev.2018.09.010. [Epub ahead of print]. PMID: 30282597

Taha Y, Patel R AG, Bagai J, Sachdeva R, Kumar G, Prasad A, Nathan S, Paul TK. Percutaneous coronary intervention versus coronary artery bypass grafting in treatment of unprotected left main stenosis. *Curr Cardiol Rep*. 2019 Mar 18;21(5):27. doi: 10.1007/s11886-019-1113-0. Review. PMID: 30880360.

Treece J, Tawadros F, Josan E. Asystole Due to Spontaneous Hemopericardiac Tamponade in a Patient on Warfarin. *Am J Ther*. 2018 Sep/Oct;25(5):e598-e599. doi: 10.1097/MJT.0000000000000612. No abstract available. PMID: 30188877

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Wang L, Howell MEA, McPeak B, Riggs K, Kohne C, Yohanon JU, Foxler DE, Sharp TV, Moorman JP, Yao ZQ, Ning S. LIMD1 is induced by and required for LMP1 signaling, and protects EBV-transformed cells from DNA damage-induced cell death. *Oncotarget*. 2017 Dec 26;9(5):6282-6297. doi: 10.18632/oncotarget.23676. eCollection 2018 Jan 19. PMID:29464072

Youssef DA, El-Fayoumi HM, Mahmoud MF. Beta-caryophyllene protects against diet-induced dyslipidemia and vascular inflammation in rats: Involvement of CB2 and PPAR-γ

receptors. *Chem Biol Interact.* 2019 Jan 5;297:16-24. doi: 10.1016/j.cbi.2018.10.010. Epub 2018 Oct 19. PMID: 30343038

Zhao J, Dang X, Zhang P, Nguyen LN, Cao D, Wang L, Wu X, Morrison ZD, Zhang Y, Jia Z, Xie Q, Wang L, Ning S, El Gazzar M, Moorman JP, Yao ZQ. Insufficiency of DNA repair enzyme ATM promotes naive CD4 T-cell loss in chronic hepatitis C virus infection. *Cell Death Dis.* 2018 Sep 5;9(9):900. doi: 10.1038/s41419-018-0897-y. PMID:29644094

Zhou Y, Li H, Siddiqui N, Caudle Y, Zhang H, Elgazzar M, Yin D. Hematopoietic stem progenitor cells prevent chronic stress-induced lymphocyte apoptosis. *Journal of Neuroimmunology.* 2017 Aug 15;309:72-76. PMID:28601292

II. PAPERS AND ABSTRACTS

γ -Tocotrienol induces apoptosis in pancreatic cancer cells by upregulation of ceramide synthesis and modulation of sphingolipid transport; Victoria E. Palau¹, Kanishka Chakraborty, Daniel Wann, Janet Lightner, Keely Hilton, Marianne Brannon, William Stone and Koyamangalath Krishnan; published in *BMC Cancer* (2018) 18:564
<https://doi.org/10.1186/s12885-018-4462-y>.

S100A9 maintains myeloid-derived suppressor cells in chronic sepsis by inducing miR-21 and miR-181b. Alkhateeb T, Bah I, Kumbhare A, Youssef D, Yao ZQ, McCall CE, and El Gazzar M. *Molecular Immunology* 2019; 112:72-81.

Interesting Case of Leptospirosis Presenting as Jaundice and Acute Renal Failure in North East Tennessee. Khan I, Khalid M, Moorman J, Ibrahim L, Youssef D. *J Microbiol Infect Dis.* 2018; 8(2):80-82.

IL-10 induces an immune repressor pathway in sepsis by promoting S100A9 nuclear localization and MDSC development. Bah I, Kumbhare A, Nguyen L, McCall CE, and El Gazzar M. *Cellular Immunology* 2018; 332:32-38.

Fibrosing Mediastinitis: Uncommon Life-threatening Complication of Histoplasmosis. Khalid M, Khan I, Rahman Z, Alazzeah A, Youssef D. *Cureus* 10(4):e2 532.
Doi:10.7759/cureus.2532 (April 25, 2018).

Continuous Infusion Ampicillin for the Outpatient Management of Enterococcal Endocarditis: a Case Report and Literature Review. Lewis PO, Jones A, Amodei RJ, Youssef D. *Journal of Pharmacy Practice* 2018 Oct 16:897190018804964. DOI:10.1177/0897190018804964.

Correction for McPeak et al., "Myeloid Cell-Specific Knockout of NFI-A Improves Sepsis Survival". McPeak MB, Youssef D, Williams DA, Pritchett C, Yao ZQ, McCall CE, El Gazzar M. *Infect Immun.* 2018 Feb 20;86(3). pii: e00820-17. doi: 10.1128/IAI.00820-17. Print 2018 Mar.

Actinomyces turicensis Bacteremia Presenting with Empyema of Lung: A Case Report. Yorke J, Karakattu S, Youssef D and El-Abbassi A. *J Health Sci Educ.* Vol 3(2): 1-4

Acute parvovirus B19 infection diagnosed by bone marrow biopsy, S Manthri MD, K Chakraborty MD; Division of Oncology, Department of Medicine, Quillen College of Medicine, ETSU, Johnson City TN; Published in *BMJ Case Reports* CP 2019; 12: e230403.
(<https://casereports.bmj.com/content/12/5/e230403.info>)

III. POSTER PRESENTATIONS

A Rare Case of Non-Producing Primary Plasma Cell Leukemia; S Manthri MD, K Chakraborty MD, (First Place); Division of Oncology, Department of Medicine, Quillen College of Medicine, ETSU, Johnson City TN; presented at Appalachian Student Research Forum in 2019.

An association between smoking status and homocysteine levels and whether this association is modified by sex hormones and cholesterol. Awasthi M, Omoike E, Paul TK, Ridner S, Mamudu H. Appalachian Student Research Forum, Johnson City, April 2019.

An unusual case of myxedema coma presenting as severe bradycardia and hypotension secondary to pituitary apoplexy. Bhogal S, Bhandari T, Mawa K, Paul TK J Investig Med, February 2019

An unusual case of myxedema coma presenting as severe bradycardia and hypotension secondary to pituitary apoplexy. Bhogal S, Bhandari T, Mawa K, Paul TK. Southern Society for Clinical Investigation, Southern Regional Meeting, New Orleans 2019.

Association of age, gender and race in chronic kidney disease patients and without dialysis. Onatolu BA, Panchal H, Francis L, Zheng S, Paul TK. Appalachian Student Research Forum, Johnson City, April 2019.

ATM gene Deletion: A Rare Etiology for Hereditary Cancers by Nina S. Appareddy, Sukesh Manthri, Fady Tawadros, Kimberly Helms, Elnora Spradling-Regional Appalachian Research Student Forum, Johnson City, TN, 4/12/2019

Atrial septal endocarditis complicating tricuspid valve endocarditis. Cardiovascular Innovations Khalid MF, Sivagnanam K, Shams W, Ramu V, Paul TK Meetings 2018, Denver, CO.

Culprit Vessel Only versus Multivessel Percutaneous Coronary Intervention in Acute ST Elevation Myocardial Infarction with Cardiogenic Shock: A Comprehensive Updated Meta-Analysis. Transcatheter Cardiovascular Therapeutic (TCT) Khalid M, Khan AA, Khattak F, Ayub M, Bagai J, Helton T, Paul TK. Scientific Conference 2018, San Diego, CA

Culprit Vessel Only versus Multivessel Percutaneous Coronary Intervention in Acute ST Elevation Myocardial Infarction with Cardiogenic Shock: A Comprehensive Updated Meta-Analysis. Khalid M, Khan AA, Khattak F, Ayub M, Bagai J, Helton T, Paul TK. J Am Coll Cadiol 2018.

Drug Eluting Stents versus Bare Metal Stents in Saphenous Vein Graft Percutaneous Coronary Intervention: An Updated Comprehensive Meta-analysis. Cardiovascular Innovations Bhogal S, Panchal H, Paul TK. Meetings 2018, Denver, CO.

Follicular lymphoma masquerading as cholecystitis and pancreatitis; S.Singal, MD; A.Mansurov, MD; A.Patel, MD; K.Chakraborty, MD; D.Jaishankar, MD; Division of Oncology, Department of Medicine, Department of Pathology, Quillen College of Medicine, ETSU, Johnson City TN; presented at Southern Regional Meeting- Southern Society Clinical Investigation 2018

Identifying multiple risk factors of hypertension for reducing the prevalence of peripheral arterial disease in rural Central Appalachia. Odebunmi OO, Orimaye SO, Mokikan MT, Awuujoola AO, Oke AO, Poole AM, Paul TK, Alamian A, Stewart D, Mamudu HM. Appalachian Student Research Forum, Johnson City, April 2019.

Individual and contextual factors associated with sub-clinical atherosclerosis in diabetes patients in rural Central Appalachia. Osedeme F, Orimaye SO, Jones A, Paul TK, Blackwell J, Budoff M, Mamudu H. American Public Health Association. November 2018.

Left anterior descending artery aneurysm associated with stent restenosis following drug eluting stent implantation. Sitwala P, Khalid MF, Ladia V, Helton T, Paul TK. Tennessee ACC chapter. Nashville, TN 2018.

Leptomeningeal involvement by prostate cancer - strike by an ominous hydra; Fady Tawadros 1 M.D , Sukesh Manthri M.D , Maria Zayko , DO, Devapiran Jaishankar M.D, Kanishka Chakraborty M.D, FACP; Division of Oncology, Department of Medicine, Department of Pathology, Quillen College of Medicine, ETSU, Johnson City TN; Presented at Southern Regional Meeting- Southern Society Clinical Investigation 2018

Long time response with Ado-trastuzumab emtansine (T-DM1) in a recurrent metastatic breast cancer; Sukesh Manthri, MD1; Sakshi Singal, MD; Bahaaeldin Youssef, MD; Kanishka Chakraborty, MD, FACP; Division of Oncology, Department of Medicine, Department of Pathology, Quillen College of Medicine, ETSU, Johnson City TN; Presented at Southern Regional Meeting- Southern Society Clinical Investigation 2018.

Metastatic basal cell carcinoma masquerading as triple negative breast cancer; S.Singal, MD; A.Mansurov, MD; H.Mejbel, MD; K.Chakraborty, MD; D.Jaishankar, MD; Division of Oncology, Department of Medicine, Department of Pathology, Quillen College of Medicine, ETSU, Johnson City TN; presented at Southern Regional Meeting- Southern Society Clinical Investigation 2018.

NOACs vs Warfarin for Atrial Fibrillation Catheter Ablation: A Meta-Analysis. Bhogal S, Bhandari T, Kohli V, Bhattad V, Papireddy M, Paul TK, Ramu V. American College of Cardiology March 2019, New Orleans, LA.

Not Your Regular Run-of-the-Mill Bladder Cancer; H Rehman MD, K Chakraborty MD, (Second Place); Division of Oncology, Department of Medicine, Quillen College of Medicine, ETSU, Johnson City TN; presented at Appalachian Student Research Forum in 2019.

Pancytopenia- A Rare Manifestation of Isolated Folate Deficiency in Pregnancy by Sukesh Manthri, Haroon Rehman, Emily Paterson, Elnora Spradling- Southern Regional Meeting, New Orleans, LA 2/21/2019

Prevalence, trends, and association of obesity and dyslipidemia among U.S. Youth: 1999-2012. Owusu D, Wang K, Paul TK, Wang L. Obesity Week 2018 in Nashville, TN.

Re-visiting Thrombolysis in Myocardial infarction (TIMI) Risk Score in the Current era of Newer Antiplatelets. Zaidi S, Khalid M, Bhogal S, Alkawaleet Y, Khan AA, Paul TK. Cardiovascular Innovations Meetings 2018, Denver, CO

Safety and efficacy of direct oral anticoagulation versus warfarin for atrial fibrillation catheter Ablation: A Meta-Analysis. Bhogal S, Bhandari T, Kohli V, Bhattad V, Papireddy M, Paul TK, Ramu V. American College of Cardiology March 2019, New Orleans, LA.

Systemic mastocytosis with associated chronic myelomonocytic leukemia; F Tawadros, MD; K Chakraborty, MD; Division of Oncology, Department of Medicine, Quillen College of Medicine, ETSU, Johnson City TN; presented at Appalachian Student Research Forum in 2018.

Ungodly act of janus kinase; Nina Amilineni MD, Fady Tawadros MD, Kanishka Chakraborty MD; Division of Medical Oncology/Hematology, Department of Internal Medicine, East Tennessee State University Quillen College of Medicine; Division of Oncology, Department of Medicine, Quillen College of Medicine, ETSU, Johnson City TN; Presented at Southern Regional Meeting- Southern Society Clinical Investigation 2018.

When cure is in sight, Trolling of cancer resumes; A.Mansurov MD, H.Rehman MD, R. Zafar MD, D. Jaishankar MD, K. Chakraborty MD; Division of Oncology, Department of Medicine, Department of Pathology, Quillen College of Medicine, ETSU, Johnson City TN; Presented at Southern Regional Meeting- Southern Society Clinical Investigation 2018

IV. EDITORIALS, WEB PAGES, LETTERS, WHITE PAPERS, Other (Non-Peer-Reviewed)
None

V. INVITED PRESENTATIONS

Krishnan K. "Recent advances in Acute myeloid Leukemia" at the Institute of Medical Education and Research. (PGI), Chandigarh, India on January 22, 2019

VI. BOOKS OR BOOK CHAPTERS

Paul TK. Pharmacogenomics and drug-drug interaction. 1133 Questions: An Interventional Cardiology Board Review. Third edition. Editors: Debabrata Mukherjee et al. Wolters Kluwer 2019.

VII. Ongoing Grants

<u>Title</u>	<u>Pi Last Name</u>	<u>Funding Agency Name</u>	<u>Type</u>	<u>Start Date</u>	<u>End Date</u>
Dishner Chair of Excellence 19-20	Krishnan	Endowment Funding		2019/07/01	2020/06/30
3169P - miRNA-mediated premature	Yao	NIH	R01	2014/12/01	2019/11/30
Telomere loss and T cell aging in HBV	Yao	NIH	R21	2018/06/21	2020/05/31
Role of Hematopoietic Stem Progenitor	Yin	NIH	R15	2018/08/01	2021/07/31
Vaccine failure in HIV Infection	Moorman	NIH	R15	2019/01/01	2021/12/31
S100A9 and MDSC development in Sepsis	Elgazzar	NIH	R35	2019/04/01	2020/03/31
Telomere loss and T cell aging in HBV	Yao	NIH	R21	2018/06/21	2020/05/31
LIMD1-Novel Marker Associated with	Ning	NIH	R15	2017/07/01	2020/06/30
IPA Agreement for Zhao/Nguyen	Yao	Veterans Affairs		2018/07/01	2019/06/30
HIV/AIDS Center of Excellence	Moorman	State of Tennessee		2019/04/01	2020/03/31
HIV/AIDS Center of Excellence	Moorman	State of Tennessee		2020/04/01	2021/03/31
MEAC Internal Medicine Reimb	Summers	ETSU Physicians and Associates		2004/07/01	
340B Outpatient Drugs Program	Moorman	Nashville Pharmacy Services, L		2012/08/01	2019/09/30
Cardiology Division Fdt PR	Summers	Multiple Funding Agency for Gr		2004/07/01	
MEAC Internal Medicine Fdt PR	Summers	Multiple Funding Agency for Gr		2004/07/01	
A Phase II Study of Doripenem	Moorman	Ortho-McNeilJanssen Scientific		2007/05/19	
Phase II Trial Pneumonia	Moorman	Theravance		2005/10/01	
Cardiovascular Research Gift	Summers	Multiple Funding COM Donations		1996/01/01	