VA Maryland

Health Care System

VA Research Week

May 15-19, 2017

2016-2017 Research Accomplishments

Information for Veterans and Community

VA MARYLAND
HEALTH CARE SYSTEM

National VA Research Week is a yearly event to celebrate outstanding accomplishments in VA Research, and to recognize our Veterans for their participation and support of VA Research.

Join the VA Maryland Health Care System Research Service as our investigators present their discoveries and we celebrate cutting-edge research that will lead to advancements in health care for our Veterans.

https://www.research.va.gov/researchweek/

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U.S. Department of Veterans Affairs

Veterans Health Administration

Office of Research and Development

Research Area	Accomplishment
Cancer Research	**Dr. Amy Fulton** and her team have gained new insights into a molecule and chemical pathway that contribute to complications and death due to breast cancer and non-small cell lung cancer. Dr. Fulton's group also demonstrated that blocking the molecule reduces cancer metastasis. These studies thus identify several new therapeutic targets for several cancers that affect the Veteran population. Recent publications: Kochel TJ, Goloubeva OG and Fulton AM. Upregulation of cyclooxygenase-2/Prostaglandin E2 (COX-2/PGE2) pathway member multiple drug resistance-associated protein 4 (MRP4) and downregulation of prostaglandin transporter (PGT) and 15-prostaglandin dehydrogenase (15-PGDH) in triple negative breast cancer. Breast Cancer Basic and Clinical Research 10:61, 2016. Kochel TJ, Reader JC, Ma X, Kundu N and Fulton AM. Multiple drug resistance-associated protein (MRP4) exports prostaglandin E2 (PGE2) and contributes to metastasis in basal/triple negative breast cancer. Oncotarget 8:6540, 2017. Bhooshan N, Staats PN, Fulton AM, Feliciano JL, Edelman MJ. Prostaglandin E receptor EP4 expression, survival and pattern of recurrence in locally advanced NSCLC. Lung Cancer 101:88, 2016. **Dr. Jean-Pierre Raufman** and his team have identified new details in the ways that colon cancer cells invade tissue and cause metastisis. Besides expanding our understanding of colon cancer cell biology, these findings suggest that targeting these potentiating interactions has therapeutic potential for Veterans with colon cancer. Recent Publications: Said A, Hu S, Abutaleb A, Watkins T, Cheng K, Chahdi A, Kuppusamy P, Saxena N, Xie G, Raufman J-P. Interacting post-muscarinic receptor signaling pathways potentiate matrix metalloproteinase-1 expression and invasion of human colon cancer cells. Biochem J. 2017 Feb 20;474(5):647-665. doi: 10.1042/BCJ20160704 Cheng K, Shang AC, Drachenberg CB, Zhan M, Raufman JP. Differential expression of M3 muscarinic receptors in progressive colon neoplasia and metastasis. Oncotarget. 2017 Mar 28;8(13):21106-21114. doi: 10.18632/oncotarget.15500.

Research Area	Accomplishment
Epidemiology and Infection Control	Infections caused by antibiotic-resistant bacteria such as Methicillin-Resistant *Staphylococcus Aureus* (MRSA) are one of the top five causes of death in nursing homes**. Drs. Daniel Morgan and Mary-Claire Roghmann** have worked closely with VA Operations, and collaborated to reduce infections in Veterans. They have used this information to update and improve guidelines and procedures to prevent infections at VA hospitals and VA Community Living Centers. Dr. Morgan was elected to the Board of Directors, Society for Healthcare Epidemiology of America (SHEA), and served as Visiting Scholar, Centers for Disease Dynamics, Economics and Policy (CDDEP). Dr. Roghmann received the Alvan R. Feinstein Memorial Award from the American College of Physicians - given for outstanding contributions to patient epidemiology and the science of patient care. Recent publications: Krouss M, Croft LD, Morgan DJ. Physician understanding and ability to communicate harms and benefits of common medical treatments. JAMA Intern Med. 2016;176(10):1565-1567. Morgan DJ, Dhruva SS, Wright SW, Korenstein D. Update on Medical Overuse. JAMA Intern Med. 176(11):1687-1692. Pineles L, Morgan DJ, Lydecker A, Johnson JK, Sorkin JD, Langenberg P, Blanco N, Lesse A, Sellick J, Gupta K, Leykum L, Cadena J, Lepcha N, Roghmann MC. Transmission of methicillin-resistant Staphylococcus aureus to health care worker gowns and gloves during care of residents in Veterans Affairs nursing homes. Am J Infect Control. 2017 Apr 18. doi: 10.1016/j.ajic.2017.03.004. [Epub ahead of print]

Research Area	Accomplishment
Emergency Medicine – Quality Improvement	Patient safety and quality improvement in emergency medicine: **Dr. Michael Grasso** and VA collaborators have shown that emergency department patients benefit from having a follow-up visit in a clinic to check on their care. They have also demonstrated increased compliance with opioid prescribing guidelines for emergency department patients. These findings will be published in: Grasso MA, Dezman ZD, Grasso CT, Jerrard DA. Opioid pain medication prescriptions obtained through emergency medical visits in the Veterans Health Administration. Journal of Opioid Management. [in press].
Eye Clinic	By using a series of changes in their processes, **Dr. Wugaas Munir** and the VAMHCS Ophthalmology clinic have shown a significant decrease in the number of cancelled surgeries and a decrease in the wait times for ophthalmology (eye) procedures at the Baltimore VA Medical Center. These interventions improved Veterans' access to eye care at VAMHCS. Dawson V, Margo JM, Munir WM, Blanco N. Reducing cancellations and optimizing surgical scheduling of ophthalmology cases at the Baltimore Veterans Affairs Medical Center (BVAMC). UMMC Patient Safety and Quality Forum, May 2017, Baltimore, Maryland. Dr. Munir's team also looked at whether the use of a new instrument was as good as two separate instruments in getting measurements needed for cataract surgery. They found that, by combining measurements into a single, easy to use device, they are able to streamline our Veterans' pre-operative visits. This reduces testing time and possibly improves results of the surgeries (improved vision). Gill E, Haidara M, Munir WM, Blanco N. Comparison of keratometric power and axis using an optical biometer, automated keratometer, and a placido-based topographer module. American Society of Cataract and Refractive Surgery Annual Meeting, May 2017; Los Angeles, California.

Research Area	Accomplishment
Mental Health Research / VISN 5 Mental Illness Research and Education Clinical Center (MIRECC)	**Dr. Leonardo Tonelli** and his team have shown that a particular type of immune cell called a CD4 T-cell may provide protection from the harmful effects of psychological stress. These cells may be used in the future to boost protection to psychological trauma in Veterans suffering from stress related disorders. Recent Publications: Clark SM, Soroka JA, Song C, Li X, Tonelli LH.CD4(+) T cells confer anxiolytic and antidepressant-like effects, but enhance fear memory processes in Rag2(-/-) mice. C Stress. 2016 May;19(3):303-11 Song C, Nicholson JD, Clark SM, Li X, Keegan AD, Tonelli LH.Expansion of brain T cells in homeostatic conditions in lymphopenic Rag2-/- mice. Brain Behav Immun. 2016 Mar 21. pii: S0889-1591(16)30062-9. **Dr.Teodor Postolache** studies the link between suicide attempts and a parasite that chronically infects the brain, Toxoplasma gondii, in humans and in animal models. Recent publication: Okusaga O, Fuchs D, Reeves G, Giegling I, Hartmann AM, Konte B, Friedl M, Groer M, Cook TB, Stearns-Yoder KA, Pandey JP, Kelly DL, Hoisington AJ, Lowry CA, Eaton WW, Brenner LA, Rujescu D, Postolache TT. Kynurenine and Tryptophan Levels in Patients With Schizophrenia and Elevated Antigliadin Immunoglobulin G Antibodies. Psychosom Med. 2016 Oct;78(8):931-939. Dr. Postolache's work on the link between suicide and pollen-induced allergies has also recently been featured in the Atlantic magazine: https://www.theatlantic.com/amp/article/523608 People with serious mental illness have high rates of obesity and related medical problems, and they die years prematurely, most commonly from cardiovascular (heart and blood vessel) disease. **Dr. Richard Goldberg, Dr. Julie Kreyenbuhl** and their research team discovered that providing computerized weight management with peer coaching (WebMOVE, a web-based program) can lower a participant's weight, and can have greater effectiveness than clinician-led in-person services. WebMOVE was well

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Mental Health Research / VISN 5 Mental Illness Research and Education Clinical Center (MIRECC)	received by the participants, and could be feasible to disseminate to others. This project was funded by VA Health Services Research and Development. Recent Publication: AS Young, AN Cohen, R Goldberg, G Hellemann, J Kreyenbuhl, N Niv, N Nowlin-Finch, R Oberman, F Whelan. Improving Weight in People with Serious Mental Illness: The Effectiveness of Computerized Services with Peer Coaches. Journal of General Internal Medicine, 32(1), 48-55. **Dr. Elizabeth Klingaman** and the **MIRECC** team. recently found that Veterans with serious mental illness and insomnia report problems with arousal, thought processes, and behavior related to their insomnia. Many of these Veterans also lacked access to settings and resources to allow for healthy sleep. These results pave the way for future research to investigate the effectiveness of existing evidence-based insomnia treatments that include guidelines for use in the context of these challenges. Recent publication: Klingaman, E. A., McCarthy, J. M., Schwartz, E. K., Gehrman, P. R., & Bennett, M. E. (in press). Targets for the Treatment of Insomnia in Veterans with Serious Mental Illness. Journal of Psychiatric Practice. Thoughts about death and dying (death ideation) can be a risk factor for suicide. This research **of Dr. Anjana Muralidharan** and the **MIRECC team** highlights the higher rates of death ideation among Veterans with serious mental illnesses and makes recommendations for ways that health practitioners can monitor this risk factor among these Veterans. Recent publication: Jahn, D., Muralidharan, A., Drapalski, A., Brown, C., Fang, L.J., Lucksted, A. (2017). Differences in Suicide and Death Ideation Among Veterans and Non-Veterans with Serious Mental Illness. Psychological Services. March 13. DOI: 10.1037/ser0000127. [Epub ahead of print]. Older Veterans with serious mental illnesses are at high risk for decreasing ability to take care of themselves and needing early placement in long-term care facilities. While weight

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Mental Health Research / VISN 5 Mental Illness Research and Education Clinical Center (MIRECC)	management and physical activity can improve functional outcomes among older adults, older Veterans with serious mental illnesses are often sedentary. The **MIRECC team** examines reasons why older Veterans with serious mental illnesses may not take part in weight management and physical activities. The research provides information for ways to develop health and wellness programs that this population is more likely to use. Recent publications: Muralidharan, A., Klingaman, E., Molinari, V., Goldberg, R. (2017). Perceived Barriers to Physical Activity in Older and Younger Veterans with Serious Mental Illness. Psychiatric Rehabilitation Journal. January 26. DOI: 10.1037/prj0000245. [Epub ahead of print] Muralidharan, A., Klingaman, E., Prior, S., Molinari, V., Goldberg, R. (2016). Medical and Psychosocial Barriers to Weight Management in Older Veterans with and without Serious Mental Illness. Psychological Services, 13(4), 419-427. doi: 10.1037/ser0000088.
Diabetes / Neuropathy	**Dr. James Russell and his research team have conducted many studies that look at diabetes and the nerve damage caused by diabetes (diabetic neuropathy).** **Dr. Lindsay Zilliox, Dr. Russell** and the research team have recently shown in a clinical trial in diabetic neuropathy that an exercise tailored to the individual Veteran is able to significant improve mobility and is associated with repair of nerve fibers. The study was a randomized, blinded, parallel group, intention to treat, lifestyle intervention program in Veterans with diabetic neuropathy. This is consistent with the intervention affecting reversal of diabeticeuropathy. This is the first randomized, controlled study to show that diabetic neuropathy can be improved by a lifestyle intervention and is a milestone in the treatment of a disorder where there has so far been no conclusive evidence that any therapy is successful. **Diabetes and Cognitive Impairment. Curr Diab Rep. 2016 Sep;16(9):87. Zilliox LA, Chadrasekaran K, Kwan JY, Russell JW.**

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Diabetes / Neuropathy	**Recently the team has identified two molecules that have the potential to treat diabetic neuropathy:** **Dr. James Russell** and his team have recently shown that a drug that affects the "mGlu2/3 receptor" is effective in experimental diabetic neuropathy and this would have relevance to treating diabetic neuropathy in humans. (A receptor is important for "unlocking" biological pathways in order for certain actions in our bodies to occur). Currently, there is no drug treatment for diabetic neuropathy. In this study, a drug that works with the mGluR2/3 receptor was tested. The drug was able to both prevent and reverse diabetic neuropathy. Another molecule, an enzyme called SIRT1, has been associated with weight loss and increased longevity. SIRT1 is also critical in enhancing mitochondrial function that is defective in diabetes and in slowing down progression of neuropathy. Mitochondrial transcription factor A regulation of mitochondrial degeneration in experimental diabetic neuropathy. Am J Physiol Endocrinol Metab. 2015 Jul 15;309(2):E132-41. A **Geriatric Research, Education and Clinical Center (GRECC)** team (**Drs. Ortmeyer, Goldberg, and Ryan**) showed that, compared to postmenopausal women with normal sugar levels, obese postmenopausal women with impaired glucose tolerance (diabetes or near-diabetes) had more abdominal fat and a lower ability for leg muscles to dissolve fat. However, after six-months of an aerobic exercise training program with weight loss, the obese women with high sugar levels were able to decrease their abdominal fat and increase the ability of their leg muscles to dissolve fat. In Press: Obesity, 2017

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Multiple Sclerosis	Physical Telerehabilitation in Veterans with Multiple Sclerosis: **Walter Royal III, MD -** This study looked at whether "remote tele-rehabilitation" can improve access to care for our Veterans in need of specialized rehabilitation services. "Remote tele-rehabilitation" makes use of a web-based Home Automated Tele-rehabilitation (HAT) program to provide prescriptive exercise to Veterans with multiple sclerosis (MS) that have difficulty attending appointments due to travel distance, disability and scheduling. The primary objective of this study was to assess the feasibility and patient acceptance of a home tele-management system to deliver remote rehabilitative therapies for MS and compare it to a tradition home exercise program. This population with predominately progressive MS maintained their overall gait (walking) abilities over a 6 month period using HAT. The HAT format was well received by the Veterans and HAT participants with higher levels of MS disability had better exercise adherence and self-reported walking ability. These findings were recently published in the Journal of Telemedicine and Telecare. Recent publication: Conroy, S.S, Zhan, M., Culpepper, W.J., Royal, W., Wallin, M.T. "Self-directed exercise in multiple sclerosis: Evaluation of a home automated tele-management system" Journal of Telemedicine and Telecare. DOI: 10.1177/1357633X17702757 Published online April 25, 2017 Neurodegeneration (deterioration of nerve cells) is an important factor for disability in multiple sclerosis (MS). Current treatments for MS reduce inflammation, but they have not been shown to reduce neurodegeneration. An enzyme called SIRT1 has been implicated in the process of neurodegeneration in neurological diseases including MS. **Dr. James Russel** and his team have studied the role of SIRT1 in experimental autoimmune encephalomyelitis (EAE) (inflammation of the brain and spinal cord) and found evidence that it protects nerves from damage. Reference: Chandrasekaran K, Sagi AR, Ray J, Russell JW, Bever CT

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Multiple Sclerosis	Jr. SIRT1 and NAD+ precursors: Therapeutic targets in multiple sclerosis a review. Nimmagadda VK, Makar TK, J Neuroimmunol. 2017 Mar 15;304:29-34. The impact of multiple sclerosis on the VA patient care mission continues to be a major concern. We need new therapies that are effective in promoting remyelination (repairing nerve cells by creating new myelin coating), preventing inflammation, and are associated with fewer side effects. **Drs Horea Rus, Violeta Rus** and collaborators have identified a molecule called "Response Gene to Complement" (RGC-32) that plays a part in MS. Their findings suggest that by developing drugs that interfere with RGC-32, we may be able to prevent multiple sclerosis development and progression. Reference: Violeta Rus, Vinh Nguyen, Alexandru Tatomir, Jason R. Lees, Armugam P. Mekala, Dallas Boodhoo, Cosmin A. Tegla, Irina G. Luzina, Paul A. Antony, Cornelia D. Cudrici, Tudor C. Badea and Horea G. Rus. RGC-32 Promotes Th17 Cell Differentiation and Enhances Experimental Autoimmune Encephalomyelitis. J Immunol March 29, 2017, 1602158; DOI: https://doi.org/10.4049/jimmunol.1602158
Stroke	The **VAMHCS Geriatric Research, Education and Clinical Center (GRECC)** conducts research studies that are aimed towards helping people regain muscle strength, function, and physical fitness after a stroke. A side effect of stroke is damage to muscle tissue. This causes reductions in muscle size and changes to how muscles control factors that determine general health. For example, muscle has a role in maintaining a healthy blood sugar level to prevent diabetes, but stroke interferes with this function. The study team (**Drs. Ivey and Hafer-Macko, Ryan, et.al.**) found that exercise/strength training is helpful in addressing this particular problem in Veteran stroke survivors. These findings are relevant to all Veterans with

Research Area	Accomplishment
Stroke	post-stroke muscle wasting. Ryan AS, Li G, Hafer-Macko C, Ivey FM. Resistive Training and Molecular Regulators of Vascular-Metabolic Risk in Chronic Stroke. J Stroke Cerebrovasc Dis. [Epub ahead of print] In this study, our research team's measure of "muscle endurance" reflected a stroke patient's ability to continuously move moderate levels of weight with their legs. This test is distinctly different from a maximum strength test, during which a person's ability to move their highest level of weight one time is recorded. Our exercise program for Veterans and others with stroke can improve both measurements substantially, but may be particularly effective for muscle endurance and associated preservation of everyday functions. This could help stroke survivors regain or maintain their levels of independence. **Ivey FM, Prior SJ, Hafer-Macko CE, Katzel LI, Macko RF, Ryan AS**. Strength Training for Skeletal Muscle Endurance after Stroke. J Stroke Cerebrovasc Dis. 2017 Apr; 26(4) Published in April 2017. PMID: 27865696 The term "sarcopenia" refers to the loss of muscle tissue as a natural part of the aging process. Methods for diagnosing someone with the condition still vary, but we applied the most commonly used approaches to both people with stroke and people without stroke (to make it a fair comparison, the stroke and non-stroke groups were similar with respect to age, gender and body weight). Results showed that those with stroke had significantly more sarcopenia or age-associated muscle loss than the non-stroke comparison group, regardless of the classification method used. Hence, Veterans with stroke are at much higher risk. **Ryan AS, Ivey FM, Serra MC, Hartstein J, Hafer-Macko CE**. Sarcopenia and Physical Function in Middle-Aged and Older Stroke Survivors. Arch Phys Med Rehabil. 2017 Mar;98(3):495-499.

Research Area	Accomplishment
Robotics / Stroke	The **VA Maryland Exercise and Robotics Center of Excellence (MERCE)** conducts research studies that are aimed towards helping people regain control of their affected muscles, gain muscle strength, and improve their physical fitness after a stroke. MERCE researchers are carrying out projects using robotic to 1. *teach* the brain and spinal cord to move again and increase dexterity, 2. to look at what happens within and between nerve cells when these therapies are used and how, 3. to look at how the brain, muscles, and nerve cells interact after stroke and in other brain conditions, and to use this knowledge to create new therapies. For example, the "anklebot" (an ankle robot) has been shown to improve stroke patients' gait, balance, ability to walk after training on a treadmill with the anklebot. In other studies MERCE has used wrist and shoulder-elbow rehabilitation robots to help the arm and hand re-learn how to do tasks after stroke. The team has also demonstrated that brain stimulation can increase the effect of training in the shoulder-elbow robot. Citations: 1. Lo A, Guarino P, Richards L, Haselkorn J, Wittenberg G, Federman D, et al. Robot-assisted therapy for long-term upper-limb impairment after stroke. N Engl J Med. 2010;362(19):1772-83. 2. Forrester LW, Roy A, Krywonis A, Kehs G, Krebs HI, Macko RF. Modular ankle robotics training in early subacute stroke: a randomized controlled pilot study. Neurorehabil Neural Repair. 2014;28(7):678-87. 3. Forrester LW, Roy A, Hafer-Macko C, Krebs HI, Macko RF. Task-specific ankle robotics gait training after stroke: a randomized pilot study. J Neuroeng Rehabil. 2016;13(1):51. 4. Wittenberg GF, Richards LG, Jones-Lush LM, Roys SR, Gullapalli RP, Yang S, et al. Predictors and brain connectivity changes associated with arm motor function improvement from intensive practice in chronic stroke. F1000Res. 2016;5:2119. As incidence of stroke is on the rise in our aging Veteran population, there is a growing need for improved treatment strategies. **Dr. Jeremy Rietschel** is working on developing better ways to characterize movement impairment caused by stroke and to determine the effectiveness of treatment for

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Robotics / Stroke	stroke in our Veteran populations. His paper, entitled "Determining Levels of Upper Extremity Movement Impairment by Applying Cluster Analysis to Upper Extremity Fugl-Meyer in Chronic Stroke" was recently **published** in the in the journal *Archives of Physical Medicine and Rehabilitation.* Evaluation of Robot Assisted Neuro-Rehabilitation - **Christopher Bever, Jr., MD, MBA, Susan Conroy, PhD** - Developing methods to improve recovery in hand function using mechanical techniques such as robots has great potential to improve the care and quality of life for Veterans with limited functional independence due to stroke. Twelve weeks of robot-assisted therapy led to modest and long-lasting improvements for patients with chronic stroke. Two novel robot-assisted arm rehabilitation interventions were compared: robot-only therapy (RT) versus robot therapy combined with guided exercise by a therapist (TTT). Results revealed that both robot-assisted therapy groups improved in arm function, though the TTT method showed greater benefit on hand use as reported by the participants.
Traumatic Brain Injury / Brain Injury	**Dr. Marc Simard** and his team identified a specific part of the head that is particularly at risk for blast overpressure injury (high pressures caused by being near a blast). This sensitive area is where the spinal cord enters the skull. This has importance for the design of protective gear in combat. Dr. Marc Simard and his team identified a treatment that helps protect against memory loss caused by blast "overpressure" (high pressures caused by being near a blast). The treatment needs to be taken before the blast. **Dr. Tibor Kristian** and his team studied the effect of a chemical process in cells when they are injured by ischemia (lack of blood flow that decreases oxygen level in the cells).

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	(Ischemia is what causes brain damage when the heart stops, as in cardiac arrest and other problems). The team found that they could protect the brain from ischemic injury if they used a chemical called NMN to treat the injury.
Rheumatology Research / Arthritis	A well-functioning immune system is essential for health. Veterans may suffer from a number of various medical conditions that all are influenced by the immune system. These include chronic infections that the immune system is meant to defend against. They also include cancers that cause harm because they evade the immune system and autoimmune diseases such as Rheumatoid Arthritis and Lupus. **Dr. Amit Golding**'s lab studies a very unique cell in the immune system that acts as the policeman to help keep the immune system in check. When this cell, called a Regulatory T cell (Treg), can't adequately control the rest of the immune system, it can go out of control. An out of control immune system can lead to harmful levels of inflammation and result in autoimmune disease. Our VA-funded research studies the immune systems of healthy individuals and compares them to Veterans with autoimmune disease in order to learn more about how Tregs do their job. Our research will hopefully lead to new and improved ways of treating diseases such as Rheumatoid Arthritis and Lupus to improve the lives of Veterans. Recent Publications: Weingartner E, Courneya JP, Keegan A, Golding A. A novel method for assaying Human regulatory T cell direct suppression of B cell effector function. J Immunol Methods. 2017 Feb;441:1-7. doi: 10.1016/j.jim.2016.11.004. PubMed PMID: 27851889. Golding A, Darko S, Wylie WH, Douek DC, Shevach EM. Deep sequencing of the TCRB repertoire of human Foxp3(+) and Foxp3(-) T cells suggests that they are completely distinct and non-overlapping. Clin Exp Immunol. 2017 Apr;188(1):12-21. doi: 10.1111/cei.12904 PubMed PMID: 27880974.

Research Area	Accomplishment
	Dr. Kamal Moudgil's VA-funded research seeks to develop a targeted drug delivery method for rheumatoid arthritis (RA) using novel joint-homing peptides (small proteins). In recent studies these peptides were used to deliver drug to rheumatic joints. This resulted in more effective in calming down joint inflammation and joint damage (compared to drugs taken without the targeting peptide). This approach has promise for the treatment of RA patients, and these findings were presented at the "International Conference and Exhibition on Nanomedicine and Nanotechnology" held in Baltimore, MD, October 12-14, 2016.
Surgery	Many people who have had a surgery are familiar with the compression devices (similar to blood pressure cuffs) that are often placed on legs in order to prevent blood from pooling in veins and causing blood clots ("deep vein thrombosis" (DVT),often a complication of surgery). But what if your leg is injured or amputated? **Dr. Preeti John**'s work showed that placing compression devices on arms instead of legs is just as good at preventing blood clots as leg compression is. This first report of this method of preventing a serious complication of surgery is being presented to the American College of Surgeons. Venous Thromboembolism Prophylaxis in Surgical Patients: Compression Device use on the Upper Extremity. John, Preeti R. et al. Journal of the American College of Surgeons, Volume 223 , Issue 4 , e115 - e116 Upper Extremity versus Lower Extremity Compression for VTE prophylaxis: Equal Efficacy and Better Compliance? - Accepted for Oral presentation at Association of VA Surgeons annual meeting Houston, May 2017 (Dr. John also published a book in which she compiled the stories of women surgeons: *Being a Woman Surgeon*.)

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	After a surgery, serious illness and other types of injury, the cells in the lining of the intestines and stomach are often damaged as well. **Dr. Jian-Ying Wang**'s laboratory studies molecules that may help repair intestinal linings. This is a common problem in our Veteran population. Recent Publication: Liu L, Zhuang R, Xiao L, Chung HK, Luo J, Turner DJ, Rao JN , Gorospe, Wang JY. HuR Enhances Early Restitution of the Intestinal Epithelium by Increasing Cdc42 Translation. Mol Cell Biol. 2017 Mar 17;37(7). pii: e00574-16. doi: 10.1128/MCB.00574-16. Recent studies from **Dr. Rao Jaladanki**'s laboratory look at another molecule that plays a part healing the lining of the gut. These findings lay a fundamental basis for developing new therapies to protect the gut mucosa in critical surgical illnesses and facilitate repair of damaged mucosa in our Veteran patients. Recent Publication: Wang P-Y, Wang SR, Xiao l, Chen J, Wang J-Y, Jaladanki RN. c-Jun Enhances Intestinal Epithelial Restitution after Wounding by Increasing Phospholipase C-γ1 Transcription American Journal of Physiolog. 2017 Apr 1;312(4):C367-C375. DOI: 10.1152/ajpcell.00330.2016
Vascular Research	Deep vein thrombosis (DVT) (blood clots in the veins) and its complications are a significant source of health complications and death in the Veteran population. **Dr. Toni Antalis** and her team have uncovered a critical role that a special type of immune cell (called a “macrophage”) plays in how the body dissolves these blood clots. Dr. Antalis’ team identified that a molecule called p53 helps the macrophage to quickly begin digesting the blood clot. Therapies that enhance the activity of this molecule may provide a potential treatment for patients with DVT. These novel findings were published in the high impact journal Blood in March 2017: Mukhopadhyay S. et al. Myeloid p53 regulates macrophage polarization and venous thrombus resolution by inflammatory vascular remodeling in mice. Blood. 2017 Mar 20. doi: 10.1182/blood-2016-07-727180. [Epub ahead of print] PubMed PMID: 28320710.

Research Area	Accomplishment
Vascular Research	**Dr. Brajesh Lal** and his team have identified cognitive impairment (reduced thought processes) as a new complication associated with "symptomatic carotid stenosis", (a narrowing or constriction of the inner surface of the carotid artery). This finding is accepted for publication as the lead article in the June issue of the *Journal of Vascular Surgery*. Dr. Lal 's team has also developed a novel method of measuring deformation and strain forces on a carotid plaque (the waxy substance that clogs an artery) using an ultrasound test, as well as methods of performing automatic 3-D imaging of carotid arterial plaques. These findings, published separately in the May issue of the *Journal of Vascular* Surgery, will help improve care of vascular surgery patients at the VA. Dr. Lal's team has also developed a novel patient-oriented venous disease outcomes measure that is being considered by FDA as a mandatory endpoint measure for patients with venous disease. His group tested this measure in patients with varicose veins undergoing treatment and showed that it was sensitive to improvements in disease severity.