



## What's New at the PVAMC Translational Musculoskeletal Research Center?

Robert L. Mauck, PhD, and George R. Dodge, PhD



Aches and pains are a part of daily life and normal aging. However, musculoskeletal (MSK) conditions can also arise as a direct consequence of military service, with associated trauma and accidents. In fact, MSK diseases and related disabilities are more prevalent in veterans than in the general population. Furthermore, while improvements in armor and “in theater” medical care have introduced incredible life-saving technologies, an increasing number of our wounded soldiers return home with damaged limbs and joints. In response, the Department of Veterans’ Affairs has focused research efforts to improve our understanding of the function of MSK tissues and injuries that occur to them, with the goal of developing novel technologies to enhance tissue repair, regeneration, and ultimately function.

In keeping with this goal, the last five years have witnessed a dramatic growth in VA-sponsored MSK research across the nation, with one of the largest increases occurring at our Philadelphia VA Medical Center (PVAMC). Physician investigators, basic scientists, and engineers at the PVAMC, together with colleagues from the University of Pennsylvania, are currently carrying out research projects focused on the injury and repair of MSK tissues, including tendons, ligaments, disc, bone, meniscus, and cartilage. Additional studies are underway to develop new technologies that may one day aid in the replacement of these tissues and ultimately improve function and quality of life. In keeping with this research focus, the PVAMC established the Translational Musculoskeletal Research Center (TMRC) in 2013. This Center brings together investigators from Orthopaedic Surgery, Rheumatology, Physical Medicine and Rehabilitation, Neurosurgery, and Bioengineering all under one roof, in >6,000 sq. ft. of newly renovated research space at the PVAMC. Drs. Robert Mauck and George Dodge co-direct this new enterprise with input,

advice, and support from a joint PVAMC/Penn TMRC Advisory Committee.

The goal of the TMRC is to develop a focused, internationally recognized research center at the PVAMC and to emerge as a VA Center of Excellence, bringing new resources and regenerative technologies to all service members, past and present. To date, more than 30 VA-based physicians, scientists, bioengineers, and research staff have co-localized to the newly renovated, state-of-the-art research space at the PVAMC Medical Research Building. Current VA funding to these investigators has increased to >\$2 million in direct costs per year (see table below). In addition, the VA has committed more than \$3 million in equipment to outfit this new facility, including state-of-the-art devices such as vivo micro-CT, fluoroscopy, atomic force microscopy, and super-resolution confocal imaging. Over the past year, the TMRC has continued to grow, with new Merit Awards (R01 equivalents), awarded to Dr. Mauck, Dr. Dodge, and Dr. Esterhai. Additionally, the TMRC received its first CDA2 Award – a five year career development award awarded to Dr. Harvey Smith from Orthopaedic Surgery. Most recently, both Dr. Carla Scanzello (Rheumatology) and Dr. Andy Kuntz (Orthopaedic Surgery) received funding through the SPiRE Award mechanism (equivalent to an NIH R21) in support of their growing research programs. Finally, Drs. Mauck and Dodge, along with the entire team, contributed to the submission of a Shared Equipment Grant, and recently heard that that



**Building a research community (via free lunch).** Students and staff enjoying bagel sandwiches at a TMRC Luncheon in November 2014.

submission is likely to be funded as well. This equipment grant will support the acquisition of a new high resolution microCT specimen scanner and associated computing resources (at a cost of ~\$500,000) for use by TMRC investigators and their collaborators across the Penn community. Overall, the TMRC is on an upward trajectory, with a vibrant multi-disciplinary

team of investigators and significant new funding directed towards making possible new discoveries in musculoskeletal repair and regeneration. The TMRC is committed to our goal of translating this research into life changing improvements in patient care and quality of life for both Veterans and the general population.

### Current VA Funding at the TMRC

Type	PI	Amount & Duration	Title
Merit	<b>D. Steinberg</b>	\$275,000 per year for four years (2012-16)	Cartilage Repair with Stem Cell Seeded Hyaluronic Acid Hydrogels
Merit	<b>J. Bernstein</b>	\$275,000 per year for four years (2013-17)	The Role of Local NSAID Administration and Inflammation on Tendon Healing
Merit	<b>G. Dodge</b>	\$275,000 per year for four years (2014-18)	Cartilage Response to Compressive Injury: A Platform for Therapeutic Discovery
Merit	<b>R. Mauck/ L. Smith</b>	\$275,000 per year for four years (2014-18)	Bioactive Injectable Implants for Functional Intervertebral Disc Regeneration
Merit	<b>J. Esterhai/ R. Mauck</b>	\$275,000 per year for four years (2014-18)	Engineered Multi-Functional Nanofibrous Meniscus Implants
CDA2	<b>H. Smith</b>	\$400,000 per year for five years (2014-19)	Tissue-Engineered Constructs for Treatment of Intervertebral Disc Degeneration
SPiRE	<b>R. Mauck</b>	\$100,000 per year for two years (2014-16)	Cartilage Repair with Synovial Joint Precursors
CPPF	<b>A. Kuntz</b>	\$50,000 over one year (2014-15)	Genetic Response in the Adaptation of Supraspinatus Tendon and Muscle to Load
SPiRE	<b>C. Scanzello</b>	\$100,000 per year for two years (2015-17)	The Impact of CC-Chemokine Receptor 7 (CCR7) on Synovitis and Osteoarthritis
SPiRE	<b>A. Kuntz</b>	\$100,000 per year for two years (2015-17)	Effect of Scaffold-Delivered Growth Factors on Rotator Cuff Repair

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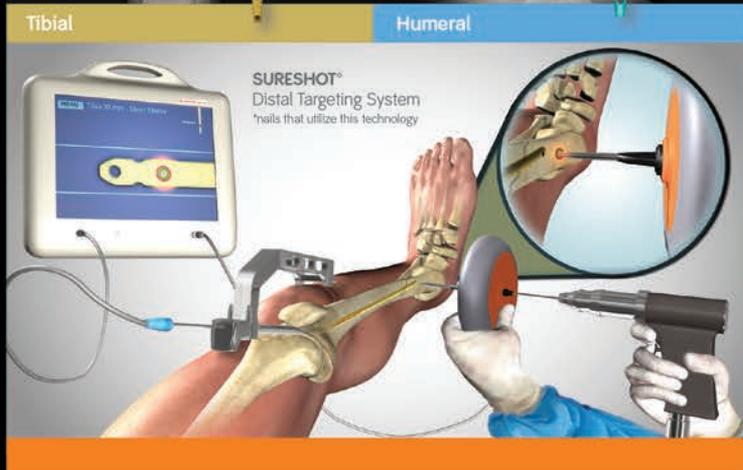
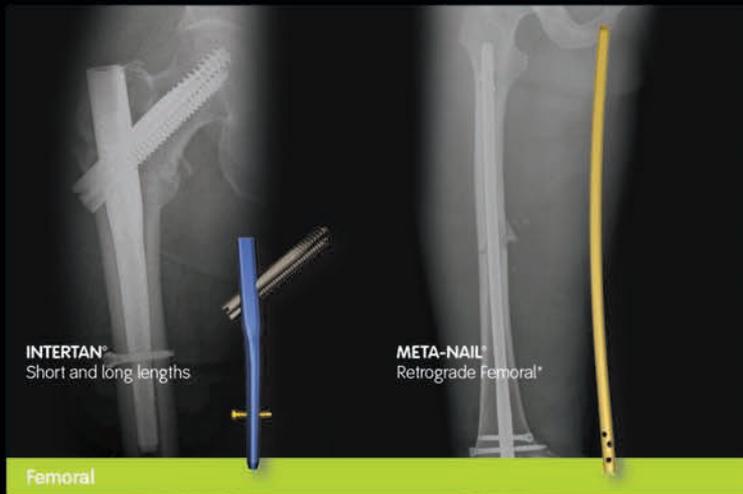
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