



EDWARD M. SCHWARZ, PhD

*Director, Center for Musculoskeletal Research
Richard and Margaret Burton Distinguished
Professor in Orthopaedic Musculoskeletal
Research*

Dr. Schwarz's pioneering work is leading to potential new treatments for diseases such as rheumatoid arthritis, bone infections, and breakthroughs in tissue regeneration. He was the highest ranked NIH-funded orthopaedic researcher in 2015—the recipient of over \$3 million dollars—according to the Blue Ridge Institute for Medical Research.



HANI AWAD, PhD

*Director, Biomechanics, Biomaterials, and
Multimodal Tissue Imaging Core, Center for
Musculoskeletal Research*

*Professor, Departments of Biomedical
Engineering, Orthopaedics, and CMSR*

Dr. Awad is an accomplished bioengineer and a leading expert in musculoskeletal tissue engineering. The interdisciplinary research in the Awad Lab is driving innovations in 3D printing and stem cell technologies for bone regeneration and drug (e.g. antibiotics) delivery.



Saving Limbs, Treating Infection

At the Center for Musculoskeletal Research (CMSR), we conduct groundbreaking research that will transform peoples' lives around the world. Our work includes creating 3D-printed bones that will be used with stem cells during surgery to save limbs, and developing a vaccine to treat life-threatening Methicillin-resistant Staphylococcus aureus (MRSA) infections following bone and joint surgery.

Our Biomaterials Fabrication Lab is leading the way in using 3D imaging and printing as a solution for bone regeneration when patients suffer traumatic bone loss. Our researchers are capable of creating personalized bone scaffolds made of bio-compatible materials to replace the original bone tissue lost to infection. To create personalized scaffolds, our scientists culture bone marrow cells from individual patients in our stem cell facility to produce sheets that coat their custom 3D-printed bone structures. A live bone construct made from a patient's own cells would then be available to use in bone repair or replacement. The 3D-printed bone scaffolds contain antibiotics to fight the infections and prevent the development of new infections.

Infections are rare during orthopaedic surgery and yet, when they do occur, they are often serious, costly, and cause long-term health problems for patients. MRSA has surpassed HIV as the leading cause of infectious death in the country—120,000 deaths per year. Our researchers have discovered an antibody that acts in conjunction with the patient's immune system to destroy MRSA. This antibody vaccine could be in clinical trials as soon as 2018.

"The next revolution in orthopaedic care will be the manipulation of molecules, genes, and proteins to repair damaged tissues, and to speed recovery. We are the internationally recognized leaders in this emerging field, and your support will help us ensure the University's legacy in musculoskeletal science and clinical care."

—Paul T. Rubery, MD, Chair of the Department of Orthopaedics and Rehabilitation,
and Marjorie Strong Wehle Professor of Orthopaedics

Help Us *Revolutionize Orthopaedic Care*

Since 2000, the CMSR has consistently ranked among the top five NIH-funded musculoskeletal programs in the country. With your support, we can recruit and train the best and brightest clinicians and scientists in orthopaedics, and we will integrate medicine and innovative technologies to improve peoples' health and quality of life. With your help, we can advance human musculoskeletal health and revolutionize orthopaedic care.

NAMING THE CENTER FOR MUSCULOSKELETAL RESEARCH—\$7,000,000

An endowment to name the Center for Musculoskeletal Research would help sustain our number one-rated orthopaedic lab in the country. It would also help provide the flexibility to focus on our faculty's groundbreaking research and innovative models of care to help people in the region, across the nation, and around the world, and to attract the best and brightest scientists.

ENDOWED AND DISTINGUISHED PROFESSORSHIPS —\$1,500,000 to \$2,000,000 (DISTINGUISHED)

Endowed professorships are permanent funds that honor acclaimed leaders who perform groundbreaking research, mentor Ph.D. candidates and early- and mid-career faculty, and help us attract talented fellows, medical students, and residents. They recognize and foster faculty excellence, and are both the highest distinction the University can bestow upon its faculty, as well as a vote of confidence in the faculty who receive them. Professorships also serve as a powerful recruitment tool, drawing new faculty of established merit from around the world.

ENDOWED FUND FOR EARLY- AND MID-CAREER INVESTIGATORS—\$500,000 to \$1,000,000

A top priority across the Medical Center is to recruit and retain outstanding early- and mid-career scientists. Your support will allow research faculty the protected time they need to conduct research that may lead to new orthopaedic treatments and innovations to improve people's mobility and quality of life. This permanent source of income will ensure that we are able to attract the best and brightest young faculty.

ENDOWED LABORATORY, EQUIPMENT, AND TECHNOLOGY FUND FOR ORTHOPAEDICS —\$250,000 to \$500,000

Facilities support has an immediate impact, helping us promote collaborative research, medical education, and regional and global outreach. A steady source of funding is absolutely critical so as to stay current with these developments. You can support the technology that speeds the path to new therapies and cures, yet adds heavily to research costs.

PILOT PROJECTS/SEED FUNDS—\$25,000 to \$100,000 (ANNUALLY)

Gifts for pilot projects/seed funds are "risk capital." These crucial funds allow scientists to shift the direction of their research to follow promising leads or new ideas, propelling scientific discoveries in new ways. You can help give researchers the time they need to push the boundaries of science and allow innovative ideas to reach their full potential.

GEORGE EASTMAN CIRCLE—\$10,000 to \$50,000

Your support for five years will provide crucial, unrestricted support for the Center for Musculoskeletal Research. Funds can help the program take advantage of new opportunities in research, support post-doctoral fellows for one year, or allow our Master's and PhD students, and post-doctoral fellows, the opportunity to travel to national scientific seminars and conferences to present their work and learn from mentors in the field of musculoskeletal health.

For more information about how your gift can make an impact, please contact Dianne Moll at: (585) 273-5506 (*office*), (585) 329-5398 (*cell*) or dianne.moll@rochester.edu.



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