

Despite significant advances over several decades, very few Tissue Engineered Medical Products (TEMPs) have been clinically or commercially successful. There is a growing need for TEMPs in multiple applications, but a significant technology gap, known as the “Valley of Death”, has prevented their scalable, consistent and cost-effective manufacture. We therefore believe that now is the time for a bold shift from the “Case Center for Multimodal Evaluation of Engineered Cartilage” with its focus on cartilage-centric evaluation technologies to instead develop, demonstrate, and deploy novel technologies to enable Quality-by-Design manufacturing of a variety of structural tissues, and to, thus, bridge the aforementioned Valley of Death.

Our objective is now to promote the adoption of our technologies by the TEMP community at large. Consequently, the center will be renamed “Center for Modular Manufacturing of Structural Tissues” (CM<sup>2</sup>OST), and will apply knowledge and technology developed during the center’s first five years to manufacturing-oriented challenges.

- Assist our Collaborative Projects and Service Projects by pushing the technologies developed by the Center's four Technology Research and Development Projects (TR&Ds) out to them.

- Through our TR&Ds, develop a cohesive set of innovative technologies, methods, and protocols that enable structural tissue manufacturing,
- Develop a new, state-of-the-art, training and dissemination program.

### FACULTY

#### Case Western Reserve University

Arnold Caplan, PhD

Jean F. Welter, MD, MSc, PhD

Harihara Baskaran, PhD

Chung-Chium Liu, PhD

Joseph M. Mansour, PhD

Seunghee Margevicius, PhD

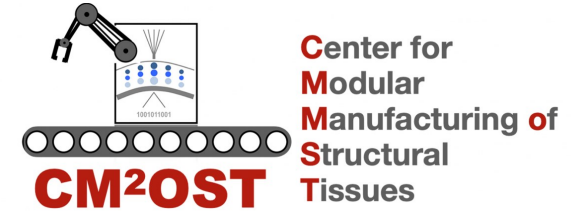
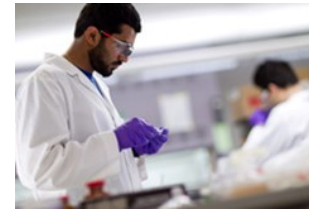
Rodrigo Somoza, PhD

#### ARMI | BioFabUSA

Thomas J. Bollenbach, PhD

Mary Clare McCorry, PhD

Richard D. McFarland, PhD, MD



## Open Research Position

### About CM<sup>2</sup>OST

The Center for Modular Manufacturing of Structural Tissues (CM<sup>2</sup>OST) is a joint effort of Case Western Reserve University (CWRU) and the Advanced Regenerative Manufacturing Institute’s BioFabUSA team to address the manufacturing challenges and promote new technologies to support manufacturing replacement human cells, tissues and organs in a scalable, consistent and cost-effective manner.



# Open Research Position

## Research Associate

Center for Modular Manufacturing of Structural Tissues  
Case Western Reserve University  
10900 Euclid Avenue  
Cleveland, OH, 44106-7080 USA

The Center for Modular Manufacturing of Structural Tissues, Department of Biology, Case Western Reserve University (Arnold Caplan, PhD, Director) has an open position for a Research Associate developing novel sensor approaches in tissue engineered medical products (TEMP) manufacturing.

### POSITION OBJECTIVE

We seek to hire a fulltime Research Associate to advance the research and development, training and dissemination and administrative activities of an NIH NIBIB P41 funded NCBIB Center. This multi-investigator Center is called the *Center for Modular Manufacturing of Structural Tissue* (CM<sup>2</sup>OST <https://cm2ost.org>).

The candidate will join a highly accomplished and active team of engineers and bioscientists whose activities include cell and tissue engineering, biomaterials, and bioreactor development for tissue engineered medical products (TEMP). The team is a collaboration between investigators in departments in the College of Arts and Sciences, the Case School of Engineering, the School of Medicine and the ARMI | BiofabUSA consortium in Manchester NH. CWRU is an R1 research institution with a strong focus in biomedical research. The labs provide a highly collaborative, collegial environment with a focus on TEMP manufacturing. Additionally, the Center activities encompass several dozen outside collaborative and service relationships with investigators or companies who use our technology.

The primary focus of this hiree will be on developing novel sensor approaches in TEMP manufacturing. These approaches will enable closed manufacturing of TEMP with process analytical technology. We are looking for intelligent, proactive, and curious individuals who are eager to take part in world-class research activities to understand and develop sensing technologies that will allow real time, in line monitoring and control of tissue manufacturing.

### ESSENTIAL FUNCTIONS

**Research:** The candidate will participate in the development, deployment and integration of sensors and control systems for cell phenotype and seeding, for environmental parameters such as culture medium components and metabolites, and for mechanical properties of developing TEMPs. In these functions he/she will primarily work with the Departments of Chemical Engineering and Biology. Sensors will be from a broad range of classes, including electrochemical, optical and acoustic, and some will incorporate biological components (DNA/RNA, proteins).

**Administrative Duties and Reporting:** The candidate will be expected to co-author or author manuscripts resulting from his/her work at the Center and present data at local, national, and international meetings. Participate in workshops and training/dissemination activities organized by the Center. Maintain accurate data recording, analyze data, write Standard Operating Procedures (SOPs). Contribute to the preparation of annual progress reports to the granting agency, and eventually in efforts towards renewing the Center funding.

**Collaborative work:** Work with outside investigators who are part of the ecosystem of Collaborative and Service projects that make use of the Center's resources. Interface with the Center co-investigators and staff located at the NH site.

### QUALIFICATIONS

**Experience:** A bioengineering background. Preference will be given to researchers with experience in biomaterial synthesis, bioreactor design & development, cell culture, molecular biology and tissue engineering. Practical experience in a manufacturing setting would be an asset.

**Education/Licensing:** A doctoral degree at the time of appointment, preferably in a bioengineering discipline or a related field, e.g., Biomedical, Electrical, Chemical, or Mechanical Engineering.

### REQUIRED SKILLS

- Ability to work in a collaborative team environment, meet deadlines, manage work from multiple individuals.
- Excellent interpersonal communication skills and a high level of proficiency in written and spoken English. This is critical. The Center is a large group and keeping everyone apprised of developments, progress, and, where needed, challenges is key to smooth operations.
- Very good time-management skills.
- Ability to manage and perform multiple tasks.
- Self-motivated with great problem-solving capabilities.

- Ability to analyze and interpret data sets & communicate data in a clear and concise manner.
- Expertise in biomaterial fabrication (synthesis and characterization), cell culture and molecular biology techniques, tissue culture desirable.
- Familiarity with MatLab, CAD/CAM software (Solidworks, Autocad or similar), and physics-based modeling software (Comsol, Abacus or similar) desirable.
- Familiarity with 3D printing/bioprinting and G-code optimization desirable.
- Ability to initiate independent research projects supported by own ideas.

### TO APPLY

For further information or to apply send inquiries containing a cover letter, CV with list of publications and contact information for three references to [tx1116@case.edu](mailto:tx1116@case.edu).

Review of applications will begin immediately and continue until the position is filled. To read full position description go to: <https://case.edu/academic-careers/research-associate-biology-0>