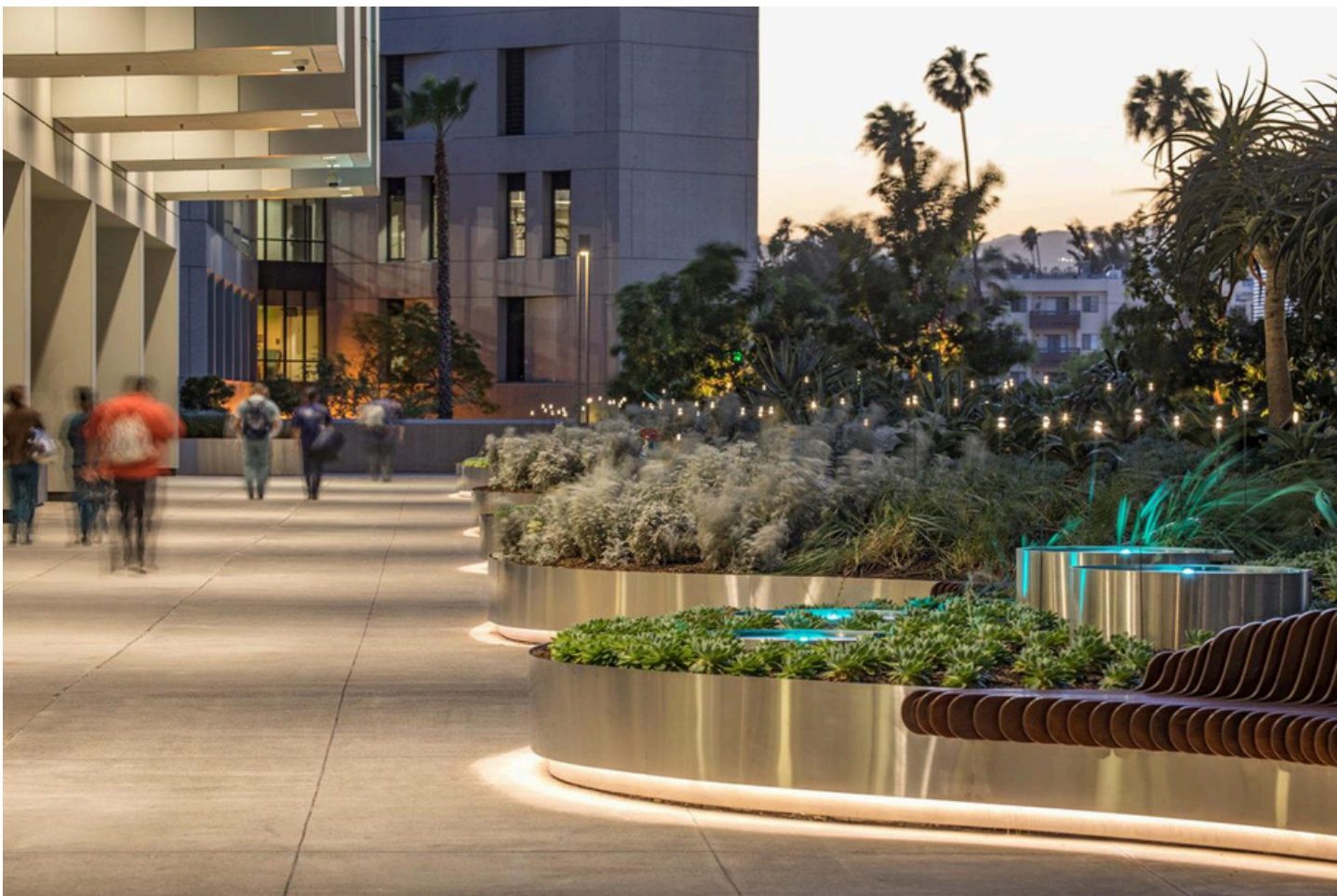


Master of Science in Regenerative Medicine



Student Handbook

2025 - 2026

Accreditation

The Cedars-Sinai Graduate School in Biomedical and Translational Science is accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges (WASC).

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Contact Information

Graduate Research Education (GRE)

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MSRM Program Director

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Academic Registrar

Alysia Caldwell

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Student Financial Advisor

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QUESTIONS?

Contact:

Mechauna Thierry, MS, MBA

MSRM Program Manager

MSRMI@csmc.edu

STEPS TO DEGREE



Background

The Master of Science in Regenerative Medicine (MSRM) Program at Cedars-Sinai prepares the next generation of scientists in stem cell biology and regenerative medicine to develop innovative, clinically impactful cell and tissue regeneration techniques. Located within the Cedars-Sinai Board of Governors Regenerative Medicine Institute (BOG-RMI), the program provides unparalleled access to state-of-the-art resources, including advanced laboratories and the Cedars-Sinai Biomanufacturing Center(CBC), which specializes in clinical-grade stem cell production.

Students engage in transformative interdisciplinary research across key areas such as cardiovascular health, neuroscience, and immune therapies. Through hands-on experience in both research and stem cell-based clinical trials at the Cedars-Sinai Alpha Clinic, they gain the expertise needed to address today's most pressing medical challenges.

The MSRM Program provides comprehensive education and training in stem cell biology and regenerative medicine. Each course is designed to immerse students in key areas of stem cell-based therapy, including advanced techniques, biomanufacturing, and clinical applications. By the end of the 20-month program, graduates will be equipped to conduct advanced stem cell research in both academic and industry settings. In the first year, students engage in didactic courses, seminars, journal clubs, and laboratory rotations to build a strong foundational knowledge. The second year focuses on industrial and biotech internships and culminates in a thesis research project, providing hands-on experience and real-world application of training.

Academic Year 1			Academic Year 2	
FALL - Trimester 1	WINTER - Trimester 2	SUMMER - Trimester 3	FALL - Trimester 4	WINTER - Trimester 5
RMI 510 Journal Club Series I	RMI 520 Journal Club Series II	RMI 530 Journal Club Series III	RMI 610 Journal Club Series IV	RMI 620 Journal Club Series V
RMI 511 Intro: Human Physiology/ Anatomy, & Pathology	RMI 523 Cell Culture and Organ- on-Chip Techniques	RMI 535 Reg. Oversight, Translat. Med., & Clin. Trials	RMI 618 Internship	RMI 629 Thesis/Project II
RMI 512 Translational Insights & Clinical Applications of Stem Cells in Regen. Med.	RMI 524 Introduction to Basic and Translational Research	RMI 536 Biomanufacturing and Cell and Gene Therapy: Principles and Practices	RMI 619 Thesis/Project I	
RMI 513 Basic Stem Cell Laboratory Techniques	RMI 527 Lab Research I	RMI 537 Lab Research II		
10 Credits	13 Credits	13 Credits	11 Credits	10 Credits

PROGRAM OVERVIEW

FIRST YEAR OF PROGRAM

Trimester 1 (September to December)

- RMI 510: Journal Club
- RMI 511: Introduction to Stem Cell Biology, Human Physiology, Anatomy and Pathology
- RMI 512: Translational Insights and Clinical Applications of Stem Cells in Regenerative Medicine
- RMI 513: Basic Laboratory Techniques

Trimester 2 (January to March)

- RMI 520: Journal Club
- RMI 523: Cell Culture and Organ-on-Chip Techniques
- RMI 524: Introduction to Basic and Translational Research
- RMI 527: Laboratory Research I

Trimester 3 (April to July)

- RMI 530: Journal Club
- RMI 535: Regulatory Oversight, Translational Medicine, and Clinical Trials
- RMI 536: Biomanufacturing and Cell and Gene Therapy: Principles and Practices
- RMI 537: Laboratory Research II

SECOND YEAR OF PROGRAM

Trimester 4 (September to December)

- RMI 610: Journal Club
- RMI 618: Internship
- RMI 619: Thesis/Project I

Trimester 5 (January to March)

- RMI 620: Journal Club
- RMI 629: Thesis/Project II

COURSE DESCRIPTIONS

RMI 510 • Journal Club I
RMI 520 • Journal Club II
RMI 530 • Journal Club III
RMI 610 • Journal Club IV
RMI 620 • Journal Club V

The Structured Journal Club is designed as a monthly gathering of students with their peers for the purpose of discussing current literature in Regenerative Medicine. This course is required during the student's 1st and 2nd year. This class refines the student's knowledge of scientific literature as well as presentation skills.

RMI 511 • Introduction to Stem Cell Biology, Human Physiology, Anatomy, and Pathology

This In this course, students will explore the anatomy and physiology of human organ systems, focusing on their structure and function. They will analyze the pathophysiology of common diseases, examining how dysfunctions disrupt normal processes. The course highlights the interdependence of organ systems in maintaining homeostasis and how they work together to research settings through case studies, diagnostics problem-solving, and the development of the therapeutic strategies.

RMI 512 • Translational Insights and Clinical Applications of Stem Cells in Regenerative Medicine

Pairs of scientists and clinicians in each program area will discuss key aspects of their fields. Topics include: Introduction to stem cells, their characteristics, and niches; molecular concepts of stem cell self-renewal and tissue and organ development; embryonic stem cells (ESCs)/iPSCs and adult stem cells (e.g., hematopoietic stem cells, HSC) and the factors that regulate their growth and differentiation; tissue-specific stem cells in the eye, hematopoietic, nervous, lung, pancreas, gut, heart, and other systems; tissue engineering and cellular and molecular biology in regenerative medicine; experimental approaches pertaining to iPSC technology and differentiation and emerging areas in stem cell research; application of pluripotent/adult stem cells to model human diseases; potential therapeutic use of these adult and pluripotent stem cells in regenerative medicine; role of stem cells in disease pathogenesis and pathways that go awry in cancer or inflammatory diseases.

RMI 513 • Basic Stem Cell Laboratory Techniques

This course students will understand and apply key laboratory safety practices, operate basic laboratory equipment and instruments, prepare and handle chemical reagents and biological samples, perform fundamental laboratory techniques (e.g., pipetting, spectrophotometry, centrifugation, electrophoresis), analyze and interpret experimental data using appropriate statistical methods, demonstrate the ability to conduct and troubleshoot standard laboratory protocols, apply good laboratory practices (GLP) and maintain accurate records.

RMI 523 • Cell Culture and Organ-on-Chip Techniques

This course provides scholars with an advanced understanding of stem cell culture, differentiation, and analysis. Throughout the course scholars will explore applications of stem cells in disease modeling, regenerative medicine, and drug discovery as well as gain exposure to the ethical, regulatory, and translational aspects of stem cell research.

RMI 524 • Introduction to Basic and Translational Research

This course provides an introduction to working in a basic and translational research environment. It'll cover all aspects of working in a research laboratory from developing a research idea to licensing and technology transfer. Classes include topics such as lab safety, regulation, and data management, biostatistics, animal research, writing IACUC and IRB protocols as well as manuscript, thesis, biosketch, and grant writing. All classes will be taught by experts in the field.

RMI 527 • Lab Research I

RMI 537 • Lab Research II

Throughout the program, students will enroll in a variable amount of research credits depending upon their stage in their graduate career. Students will have the opportunity to perform cutting- edge research in various areas.

RMI 535 • Regulatory Oversight, Translational Medicine, and Clinical Trials

Scientists and Clinicians will discuss key aspects related to clinical trials, regulatory oversight of research and specific topics related to translational medicine. The curriculum will provide students with the integrated knowledge and broad perspectives needed to effectively develop clinical trials and manage regulatory processes, from discovery to commercialization. With a focus on building skills and training for the future, this program is designed for professionals looking to advance their careers in clinical medicine.

RMI 536 • Biomanufacturing and Cell and Gene Therapy: Principles and Practices

This course explores advanced biomanufacturing technologies, focusing on the production of biologics and cell and gene therapies. Emphasis will be placed on upstream and downstream process optimization, regulatory challenges, quality control, and emerging technologies. Designed to bridge academic knowledge and industry practices, this course combines theoretical insights with practical experience, empowering students to excel in the production, quality assurance, and quality control of cell and gene therapies within GMP-compliant environments.

RMI 618 • Internship

This course provides real world experience and an integral part of scientific education. It enables correlation of class room learning with its application in industry and broadens understanding of the types of employment available in the field. This course will allow the students to discover their individual interests and builds resume credentials between regenerative medicine and industrial firms.

RMI 619 • Thesis/Project I RMI 629 • Thesis/Project II

The purpose of the Master's Thesis is to provide a student an opportunity to demonstrate they have successfully mastered the intellectual and performance requirements necessary to obtain their Master's Degree in Regenerative Medicine. Successful completion and defense of the Master's Thesis is a requirement of all students in the Master's Degree program.

KEY FACULTY

PROGRAM LEADERSHIP DIRECTORS



Wafa Tawackoli, PhD
MSRM Program Director



Deepti Lall, PhD
MSRM Assistant Program Director

COURSE DIRECTORS

Arun Sharma, PhD

Course Director for RMI 510, 520,
530, 610, 620

Athanasia Panopoulos, PhD

Course Director for RMI 511

Deepti Lall, PhD

Course Director for RMI 511

Dhruv Sareen, PhD

Course Director for RMI 536

Dmitriy Sheyn, PhD

Course Director for RMI 524

Loren Ornelas, MBA

Course Director for RMI 536

Maedeh Mozneb, PhD

Course Director for RMI 510,
520, 530, 610, 620

Maria G. Otero, PhD

Course Director for RMI 513

Michael Lewis, MD

Course Director for RMI 535

Michael Workman, PhD

Course Director for RMI 523

Pablo Avalos, MD

Course Director for RMI 535

Ritchie Ho, PhD

Course Director for RMI 513

Robert Barrett, PhD

Course Director for RMI 523

Ruchi Shah, PhD

Course Director for RMI 524

Wafa Tawackoli, PhD

Course Director for RMI 512

TUITION & FEES CALENDAR

Program Tuition	Standard Amount	Due Date
Trimester 1 (10 credit hours)	\$2,000	Week 1 of Term
Trimester 2 (13 credit hours)	\$2,000	Week 1 of Term
Trimester 3 (13 credit hours)	\$2,000	Week 1 of Term
Trimester 4 (11 credit hours)	\$2,000	Week 1 of Term
Trimester 5 (10 credit hours)	\$2,000	Week 1 of Term
Total Program Tuition	\$10,000	

Student Fees	Standard Amount	Due Date
Lab/Clinical Fees	\$2000	Week 1 of Term
Books, Materials, Technology Fee	\$2000	Week 1 of Term
Grad Student Association Fee	\$2000	Week 1 of Term
Registration Fee	\$2000	Week 1 of Term
Student Program/Resource Fee	\$2000	Week 1 of Term
Total Student Fees (Per Term)	\$10,000	

Total Tuition + Student Fees (All Terms)	\$20,000
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Questions? Contact Victor Jackson, Student Financial Administrator
Victor.Jackson@cshs.org