

# Skeletal Biology & Regeneration

Area of Concentration

UConn Health

Biomedical Sciences PhD

Program

## What you should know about our program

- Explores the cellular, molecular and genetic processes related to skeletal development, skeletal diseases, injuries and their regeneration
- A highly multi-disciplinary program that includes over 25 research labs at UCONN
- A vibrant educational environment that includes scientific symposia, seminar series, student awards, and opportunities for outreach

## Research Areas

Stem Cells  
Cartilage and Bone Differentiation  
Osteoporosis  
Bone Remodeling  
Bone Fracture Repair  
Biomaterials  
Scaffold Design  
Osteoarthritis  
Biomechanics  
Biomineralization  
Aging  
Limb and Craniofacial Development  
Oral Infection and Biofilms  
Cancer Biology  
Osteosarcoma and Endocrine Tumors  
Drug and Stem Cell Delivery  
Rare Skeletal Diseases

## Welcome

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On behalf of the faculty representing the Skeletal Biology & Regeneration (SBR) Area of Concentration, welcome to UCONN Health

It's a very exciting time to be in the field of skeletal biology and tissue regeneration. Scientific breakthroughs in a variety of disciplines such as, stem cell biology, genomics, imaging, and tissue engineering have truly revolutionized our understanding of the human skeleton.

A common misconception of visiting students regarding our program is the belief that a background in skeletal biology is needed for entering our program. In reality, we view students educated and trained outside our immediate field as a strength.

Laboratories in SBR work in human, mouse and zebra fish systems; study transcriptional, post-transcriptional and epigenetic mechanisms regulating gene expression; utilize mouse and iPSC models of human diseases; use novel biomaterials to facilitate drug delivery and defect repair.

Our well-funded faculty are internationally recognized leaders in skeletal biology, stem cells, biomaterials and biomedical engineering. We are also leaders at the University in mentoring and teaching.

Please contact us if you have any questions about our program. We look forward to meeting you!

**Rosa Guzzo, PhD**

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Director of SBR AoC

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Associate Director of SBR AoC

To Learn More About Our Program Please Visit:

Program Website: <https://bit.ly/35zCanA>

Introductory Video: <https://bit.ly/3qcPxlb>

- Coursework tailored to meet *individual* goals and interests
- Basic graduate school requirements plus choice of >20 diverse offerings
- *In-depth specialty courses:*  
Skeletal Biology, or Craniofacial & Oral Biology
- Cross-listed courses available from *UConn's Bioengineering Program*
- Weekly multidisciplinary journal club

### Successful future careers:

**Our PhD graduates have successful careers in diverse fields and institutions, working in academia, industry, health care and government, performing basic and clinical research, education, and outreach.**

## Skeletal Biology and Regeneration has 34 active faculty members

### Some of the faculty accepting rotation students for 2022-2023:

[Andrew Arnold](#), M.D., Professor of Medicine and Murray-Heilig Chair in Molecular Medicine. Molecular genetic underpinnings of tumors of the endocrine glands. Role of cyclin D1 in tumorigenesis.

[Ernesto Canalis](#), M.D., Professor of Orthopaedic Surgery and Medicine. Role of Notch and Nuclear factor of activated T cells (NFAT) in osteoblasts *in vivo* and *in vitro*, and *in disease models* for Hajdu Cheney Syndrome and Lateral Meningocele Syndrome.

[Caroline N. Dealy](#), Ph.D., Associate Professor of Craniofacial Sciences. Exploring the cells and signals controlling cartilage development and growth; response of adult cartilage to injury and aging that lead to osteoarthritis.

[Anne Delany](#), Ph.D., Associate Professor of Medicine. Regulation of osteoblast and osteoclast gene expression by microRNAs; Molecular mechanisms controlling bone remodeling.

[Alix Deymier](#), Ph.D., Assistant Professor of Biomedical Engineering. Elucidating the relationship between the musculoskeletal system and the acid/base balance in the body.

[Rosaria Guzzo](#), Ph.D., Assistant Professor of Neuroscience. Epigenetic mechanisms that modulate chondrocyte differentiation and endochondral bone growth.

[Liisa T. Kuhn](#), Ph.D., Associate Professor of Biomedical Engineering. Biomaterials for drug delivery and bone regeneration and repair.

[Sangamesh Kumbhar](#), Ph.D., Assistant Professor of Orthopaedic Surgery. Synthesis and characterization of novel biomaterials/polymers for tissue engineering and drug delivery applications.

[Mina Mina](#), D.M.D., Ph.D., Professor of Craniofacial Sciences, Division of Pediatric Dentistry. Origin, maintenance, proliferation and differentiation of adult stem cells in dental pulp.

[Lakshmi Nair](#), Ph.D. Associate Professor of Orthopaedic Surgery. Understanding how cells interact with biomaterials; how to modulate cell-biomaterial interactions for developing novel biomaterial based therapies.

[Vanessa M. Scanlon](#), PhD., Assistant Professor, Center for Regenerative Medicine and Skeletal Biology. Extrinsic mechanisms that underly hematopoietic progenitor cell fate decisions.

[Tannin A. Schmidt](#), Ph.D., Associate Professor of Biomedical Engineering. Basic and translational bioengineering of proteoglycan 4 (lubricin) at biointerfaces and biomaterials.

[Daniel Youngstrom](#), Ph.D., Assistant Professor of Orthopedic Surgery. Osteochondral progenitor cell biology and mechanisms of bone regeneration.