Webinar on "Multicellular Scaffolds for Skeletal tissue Engineering"– Reg.

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1 attachments (2 MB)

BT Webinar poster.jpg;

Ref: KLEF/RO/HOD-BT/2020-21 Date: 11.08.2020

Orders of the Vice-Chancellor dt.11.08.2020

CIRCULAR

Sub: Webinar on **"Multicellular Scaffolds for Skeletal tissue Engineering"– Reg.**
Ref: Letter dated 11.08.2020 from Dr.K. Giridhar, HOD-BT.

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This is to inform all the faculty members and students that Department of Biotechnology Engineering, KLEF, is organizing a Webinar titled **"Multicellular Scaffolds for Skeletal tissue Engineering"**, by Dr. Esmaiel Jabbari, Professor, Dept. of Chemical and Biomedical Engineering, University of South Carolina, USA, at 7.00 p.m. on 14th August 2020 (Friday). Prof. Jabbari's research draws upon Chemistry, Biology, Macromolecular Science and exploits biomimetic strategies to engineer cellular constructs for regeneration of skeletal tissues. Prof. Jabbari is also a visiting Professor of Medicine at Harvard Clinical and Translational Center, Boston, USA.

Poster of the webinar is attached herewith and participation link is given below.

https://kluniversity.webex.com/kluniversity/j.php?MTID=m4e34eec2af57036d5878ccfc5ccf2b09

For any queries on webinar Dr. Nadeem S, Assoc.Professor and Dr. G. Siva Reddy, Asst.Professor, Department of Biotechnology, can be contacted.

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Thanks & Regards

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Ph.D(Mech. Engg.)., DPM., MBA (Fin & HR)., FICWA
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MULTICELLULAR SCAFFOLDS FOR SKELETAL TISSUE ENGINEERING

OBJECTIVES

The objective of the topic "Multicellular Scaffolds for Skeletal Tissue Engineering" is to explore and understand the use of multicellular scaffolds in the field of tissue engineering, specifically focusing on skeletal tissues such as bones and cartilage. This topic aims to achieve several key objectives:

1. **Understanding Tissue Engineering:** The topic seeks to provide a comprehensive understanding of tissue engineering principles, particularly in the context of skeletal tissues. This includes the basics of tissue regeneration, the role of scaffolds, and the importance of cellular interactions in tissue development and repair.
2. **Exploring Multicellular Scaffolds:** The objective involves delving into the concept of multicellular scaffolds and their significance in tissue engineering. Multicellular scaffolds are three-dimensional structures that mimic the natural extracellular matrix and provide a supportive environment for cells to grow, differentiate, and form functional tissues.
3. **Analyzing Scaffold Materials:** The topic aims to analyze the different materials used in multicellular scaffolds for skeletal tissue engineering. This includes synthetic polymers, natural biomaterials (e.g., collagen, gelatin), bioceramics, and composite materials designed to mimic the mechanical properties and biological cues of native tissues.
4. **Studying Cell-Scaffold Interactions:** An important objective is to study the interactions between cells and multicellular scaffolds. This involves examining cell adhesion, proliferation, differentiation, and tissue-specific functions within the scaffold environment. Understanding these interactions is crucial for optimizing scaffold design and tissue regeneration outcomes.
5. **Applications in Skeletal Tissue Repair:** The topic explores the applications of multicellular scaffolds in repairing and regenerating skeletal tissues such as bones and cartilage. This includes discussing strategies for bone grafts, joint repair, spinal fusion, and addressing musculoskeletal disorders through tissue engineering approaches.
6. **Advancements and Innovations:** Another objective is to highlight recent advancements, innovations, and emerging technologies in the field of multicellular scaffolds for skeletal tissue engineering. This may include developments in scaffold fabrication techniques, bioactive molecule delivery systems, and the integration of stem cells or growth factors for enhanced tissue regeneration.
7. **Clinical Translation and Challenges:** Lastly, the topic aims to address the challenges and considerations in translating multicellular scaffold technologies from the laboratory to clinical applications. This includes regulatory aspects, scalability, long-term safety, and efficacy assessments in preclinical and clinical studies.

DESCRIPTION

Overall, the objective of "Multicellular Scaffolds for Skeletal Tissue Engineering" is to advance knowledge and understanding in the field, promote innovation in scaffold design and application, and ultimately contribute to the development of effective strategies for repairing and regenerating skeletal tissues.

OUTCOMES

The outcome of studying "Multicellular Scaffolds for Skeletal Tissue Engineering" can lead to several significant advancements and benefits in the field of regenerative medicine and tissue engineering. Here are some potential outcomes that could result from exploring this topic:

1. **Improved Tissue Regeneration:** One of the primary outcomes is the development of more effective strategies for regenerating skeletal tissues such as bones and cartilage. Multicellular scaffolds provide a supportive environment for cells to grow, differentiate, and organize into functional tissues, leading to improved outcomes in tissue repair and regeneration.
2. **Enhanced Scaffold Design:** Understanding multicellular scaffolds can lead to the design of scaffolds with optimized properties for tissue engineering applications. This includes considerations such as biocompatibility, mechanical strength, porosity, surface topography, and the incorporation of bioactive molecules or growth factors to enhance tissue regeneration.
3. **Cell-Scaffold Interactions:** Studying cell-scaffold interactions can lead to insights into how different cell types behave within the scaffold environment. This knowledge can inform strategies for promoting cell adhesion, proliferation, differentiation, and tissue-specific functions, ultimately improving the integration of engineered tissues with native tissues upon implantation.
4. **Functional Tissue Formation:** The outcome of using multicellular scaffolds is the development of engineered tissues that closely mimic the structure and function of native skeletal tissues. This includes the formation of mineralized bone tissue with appropriate mechanical properties, as well as cartilage tissues capable of bearing mechanical loads and supporting joint function.
5. **Applications in Clinical Settings:** Advancements in multicellular scaffolds for skeletal tissue engineering can lead to practical applications in clinical settings. This may include using engineered tissues for bone grafts, joint repair procedures, spinal fusion surgeries, and addressing musculoskeletal injuries or degenerative disorders.
6. **Regulatory and Safety Considerations:** Another outcome involves addressing regulatory and safety considerations associated with the clinical translation of multicellular scaffold technologies. This includes conducting preclinical studies to assess the safety and efficacy of engineered tissues, complying with regulatory guidelines for medical devices or biologics, and ensuring long-term biocompatibility and functionality.
7. **Contributions to Healthcare:** Overall, the outcome of research and development in multicellular scaffolds for skeletal tissue engineering contributes to improving patient outcomes, reducing morbidity associated with skeletal injuries or diseases, and advancing the field of regenerative medicine as a whole.

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ON FRIDAY
TIME: 7.00 PM
14.08.2020

DEPARTMENT OF BIOTECHNOLOGY

MULTICELLULAR SCAFFOLDS FOR SKELETAL TISSUE ENGINEERING

WEBINAR

KL UNIVERSITY
40 YEARS OF EDUCATIONAL LEADERSHIP
2020

RESOURCE PERSON

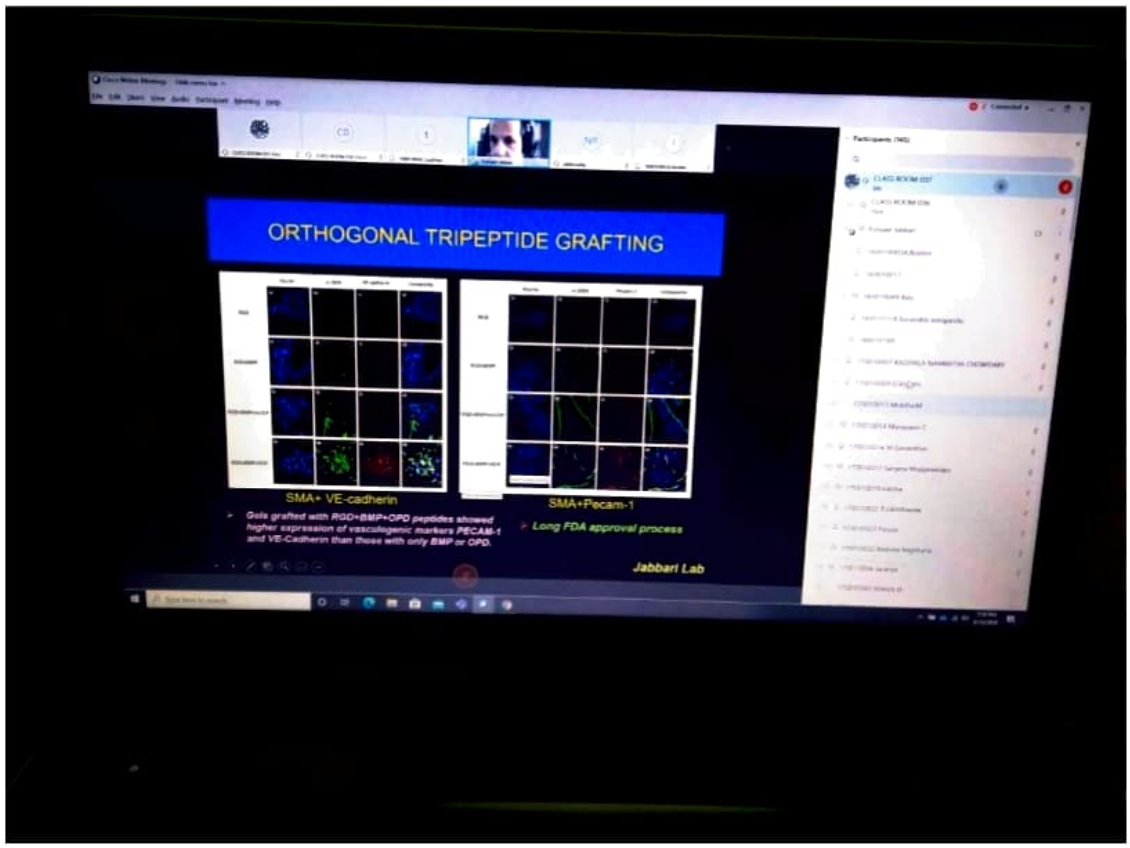
Dr.Esmaiel Jabbari,
Professor of Chemical and Biomedical Engineering , University of South Carolina, USA.

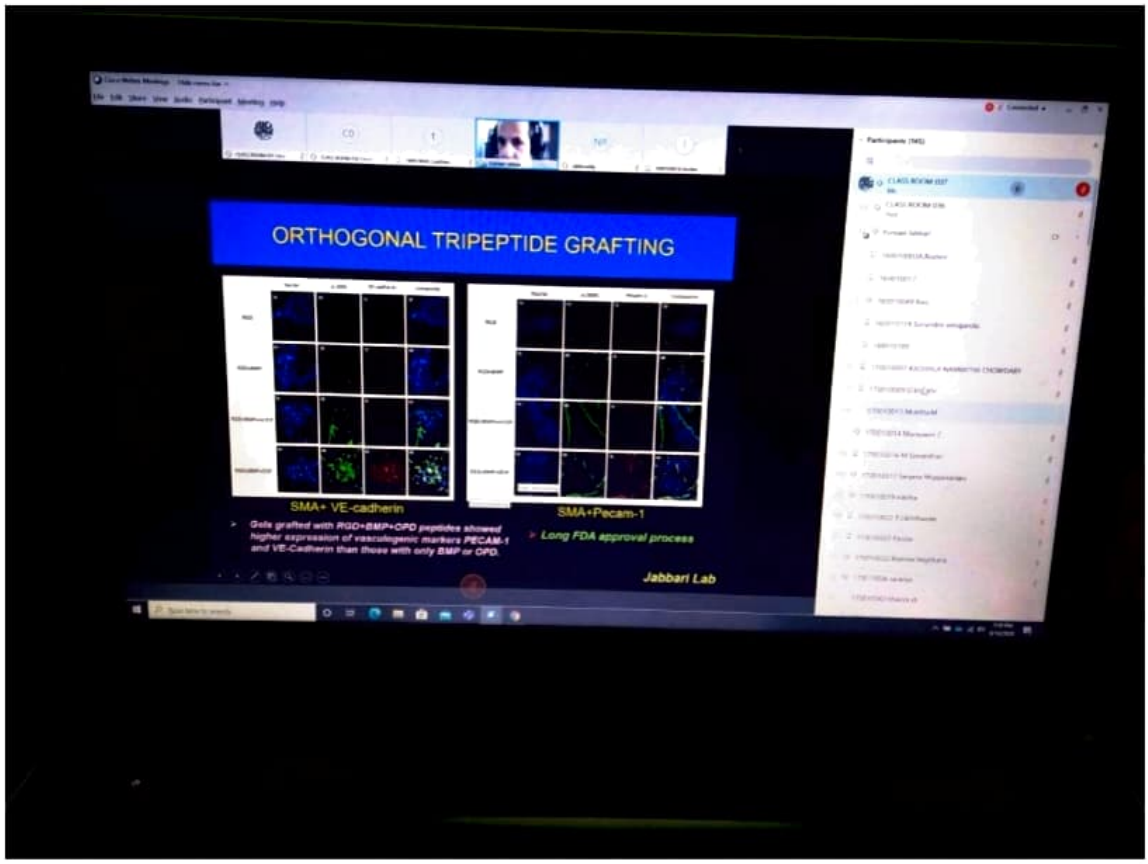
ORGANIZERS

Dr.Nadeem Siddiqui
Associate Prof

Dr.G Siva Reddy
Asst.Prof

Webinar meeting link:
https://kluniversity.webex.com/kluniversity/j.php?MTID=m4e34eec2af57036d5878ccfc5ccf2b09


ORTHOGONAL TRIPEPTIDE GRAFTING
SMA+ VE-cadherin
SMA+Pecam-1
Gels grafted with RGD+BMP+OPD peptides showed higher expression of vasculogenic markers PECAM-1 and VE-Cadherin than those with only BMP or OPD.
Long FDA approval process
Jabbari Lab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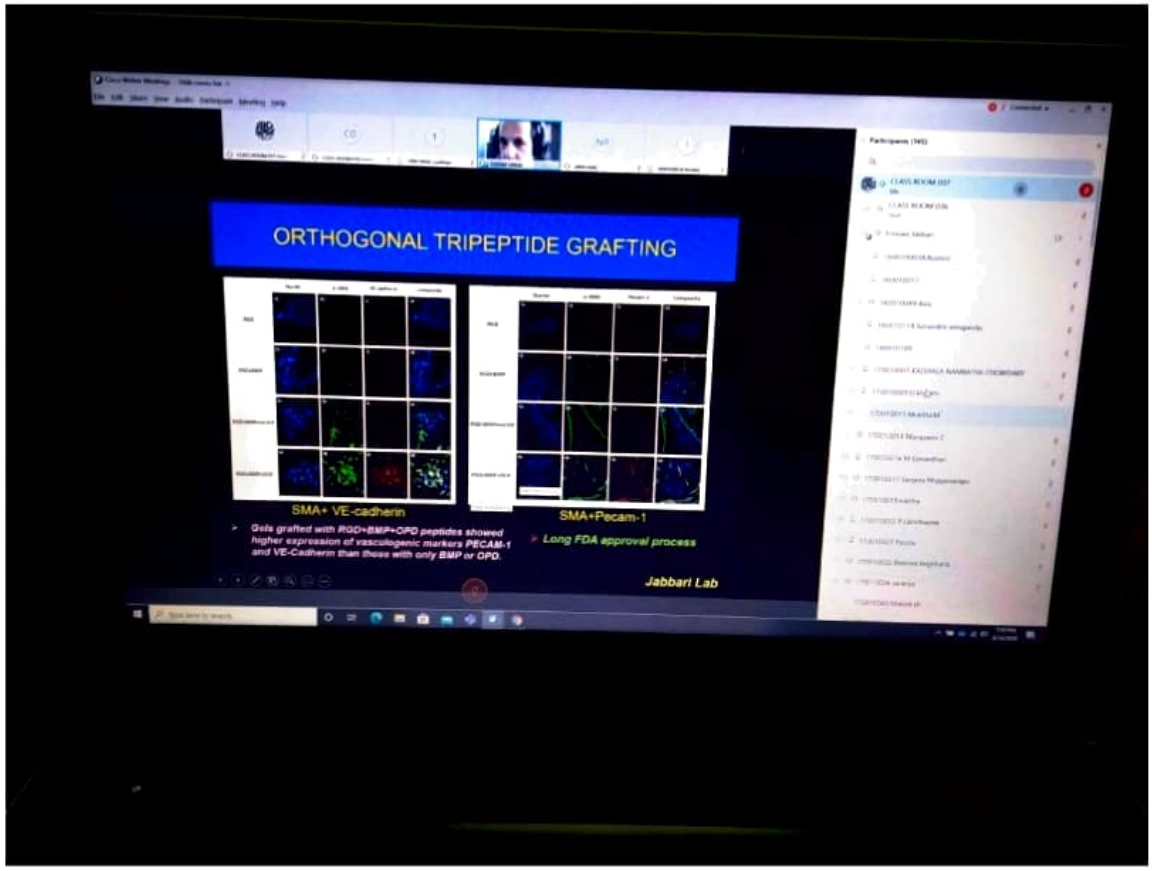
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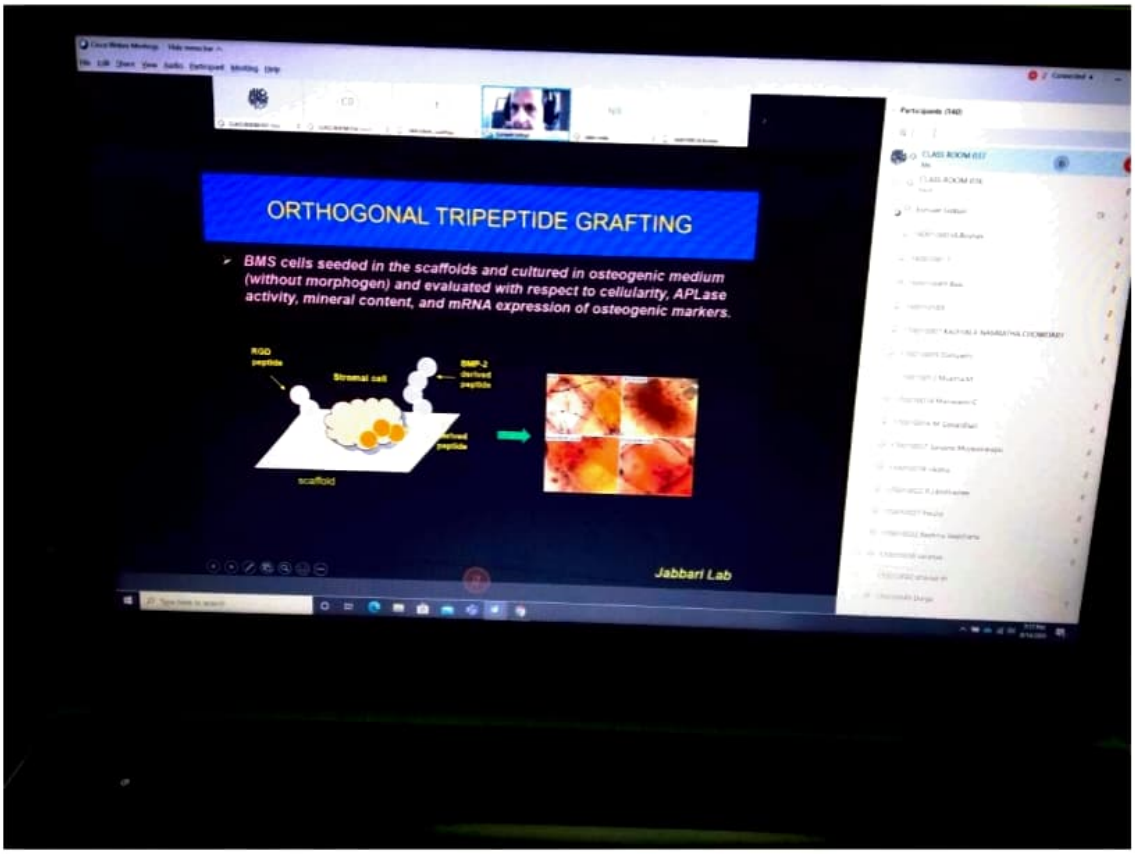
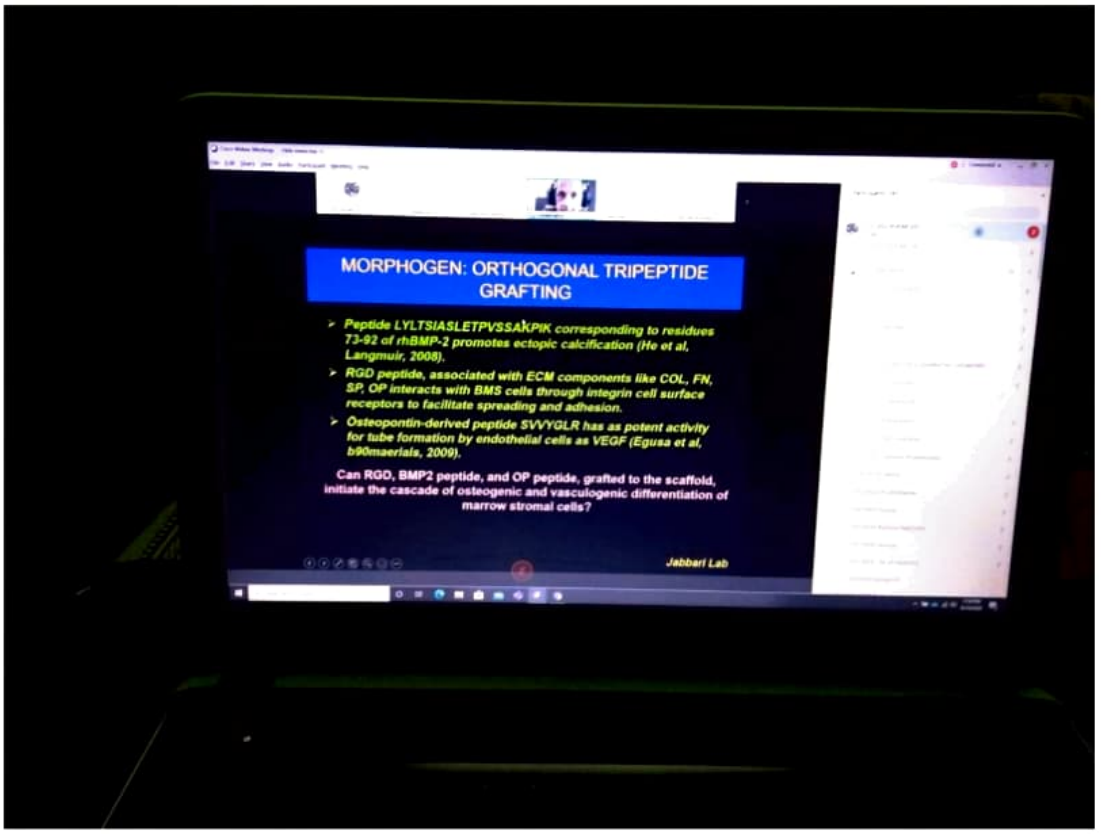

ORTHOGONAL TRIPEPTIDE GRAFTING
BMS cells seeded in the scaffolds and cultured in osteogenic medium (without morphogen) and evaluated with respect to cellularity, APLase activity, mineral content, and mRNA expression of osteogenic markers.
RGD peptide
Stromal cell
BMP-2 derived peptide
scaffold
Jabbari Lab


MORPHOGEN: ORTHOGONAL TRIPEPTIDE GRAFTING
Peptide LYLTSIASLETPVSSAKPIK corresponding to residues 73-92 of rhBMP-2 promotes ectopic calcification (He et al, Langmuir, 2008).
RGD peptide, associated with ECM components like COL, FN, SP, OP interacts with BMS cells through integrin cell surface receptors to facilitate spreading and adhesion.
Osteopontin-derived peptide SVVYGLR has as potent activity for tube formation by endothelial cells as VEGF (Egusa et al, b90maerials, 2009).
Can RGD, BMP2 peptide, and OP peptide, grafted to the scaffold, initiate the cascade of osteogenic and vasculogenic differentiation of marrow stromal cells?
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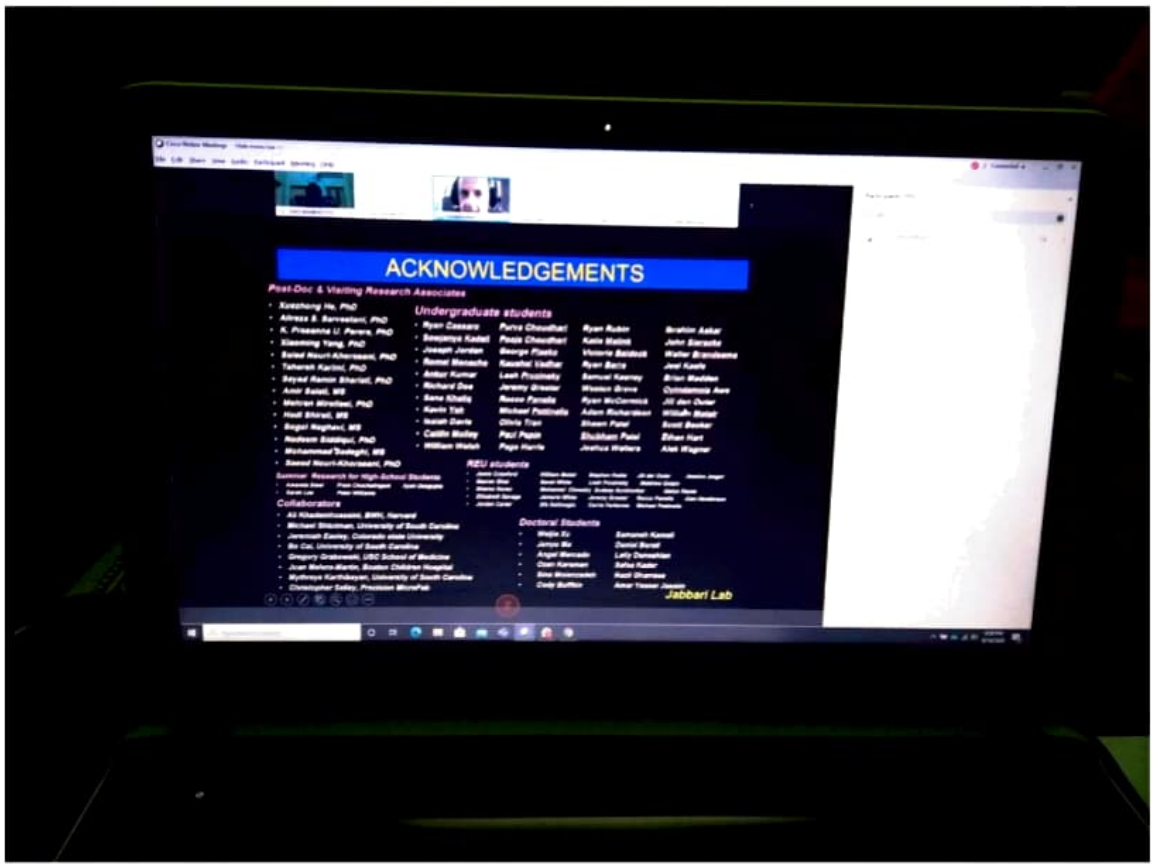
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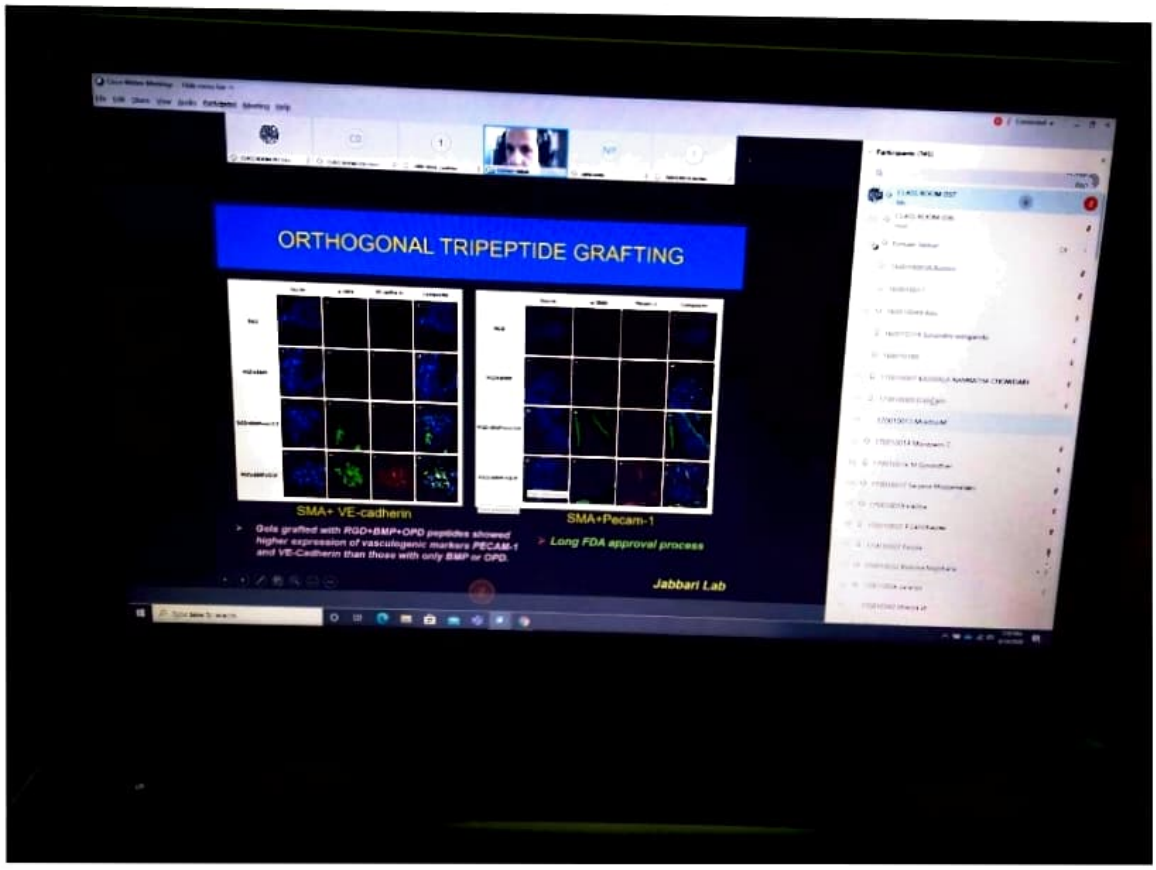
Undergraduate students
RIU students
Doctoral Students
Collaborators
Jabbari Lab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Jabbari Lab

Multicellular scaffodls for skeletal Tissue Engineering

DEPARTMENT OF BIOTECHNOLOGY

Dr. Esmael Jabbari

14-8-2020

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139	shanmukh sri surya allu	
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142	VELIVELA SAINADH	
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