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4th International Conference on Biotechnology Engineering - 2016
July 25 - 27, 2016 • Kuala Lumpur, Malaysia
"Harnessing Biotechnology for Sustainable and Green Future"

EXPLORING THE FEASIBILITY IN USING MEDICAL COMPUTERIZED TOMOGRAPHY TO MONITOR GROWTH PROGRESSION IN TISSUE ENGINEERED CARTILAGE CONSTRUCT PREPARED FROM CHONDROCYTES SEEDED ON POLY(LACTIC-CO-GLYCOLIC ACID) BASED SCAFFOLDS

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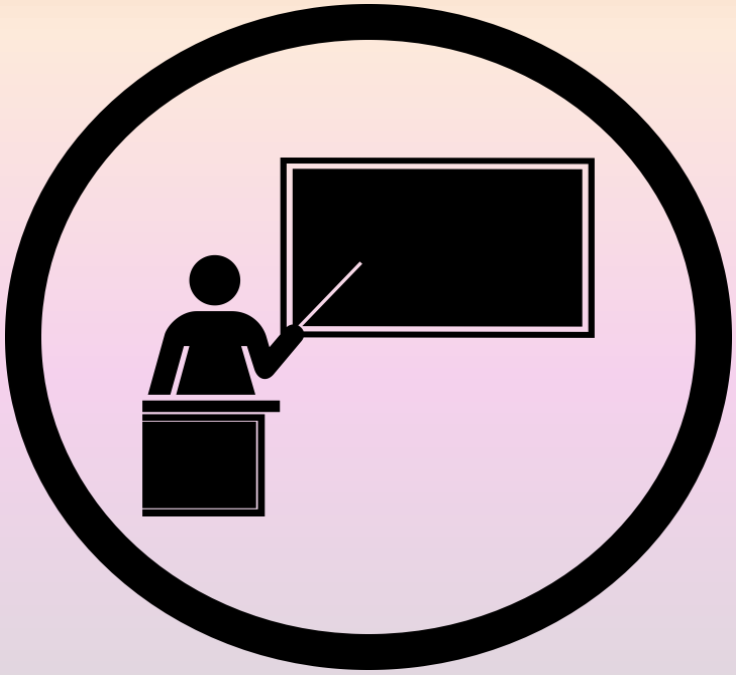


Presentation Outline

Introduction
Research Statement
Materials and Methods
Results & Discussion
Future Work
References

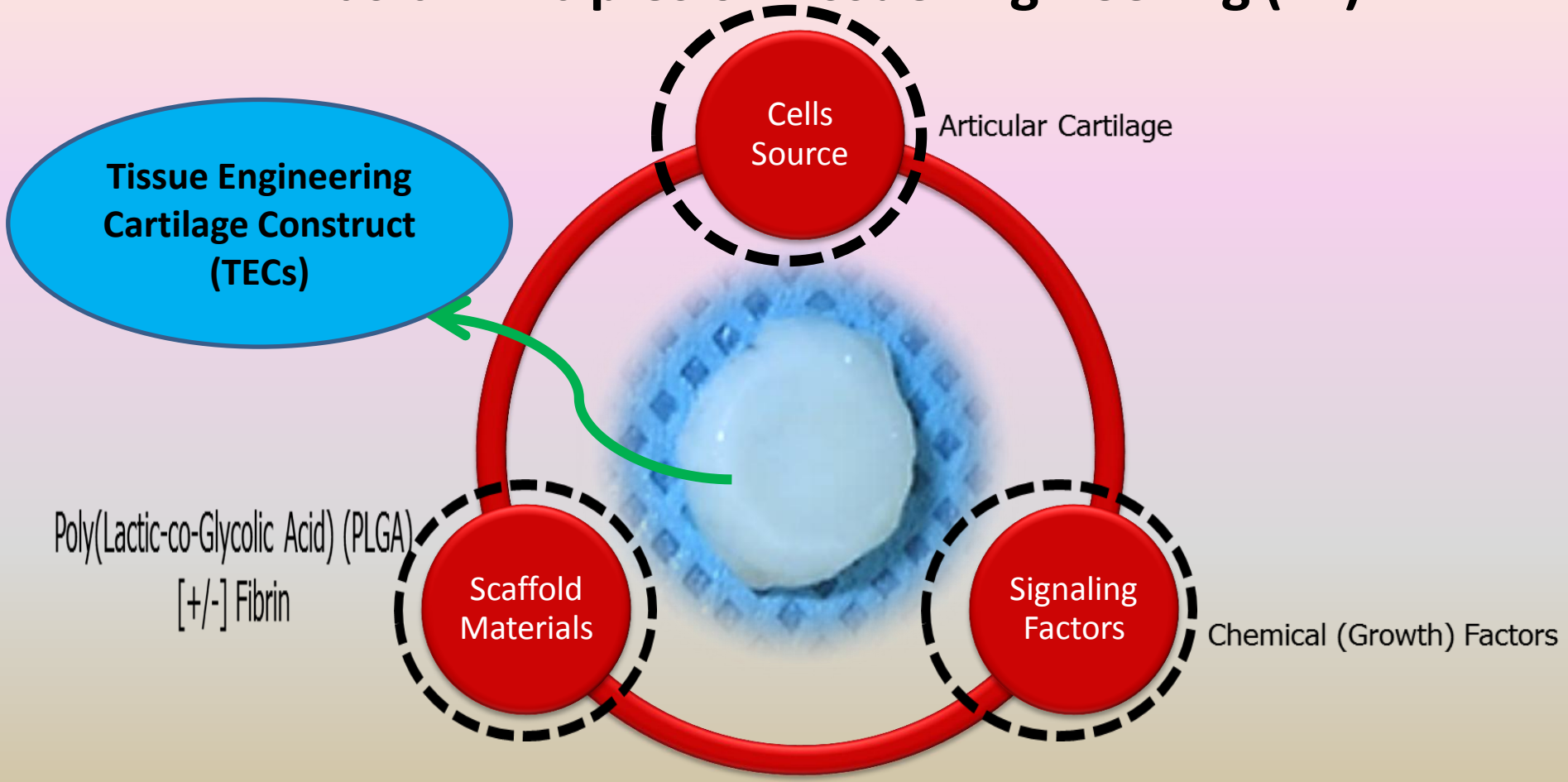
Osteoarthritis

MedicalJane

Tissue Engineering

INTRODUCTION

Basic Principles of Tissue Engineering (TE)



TE APPROACH

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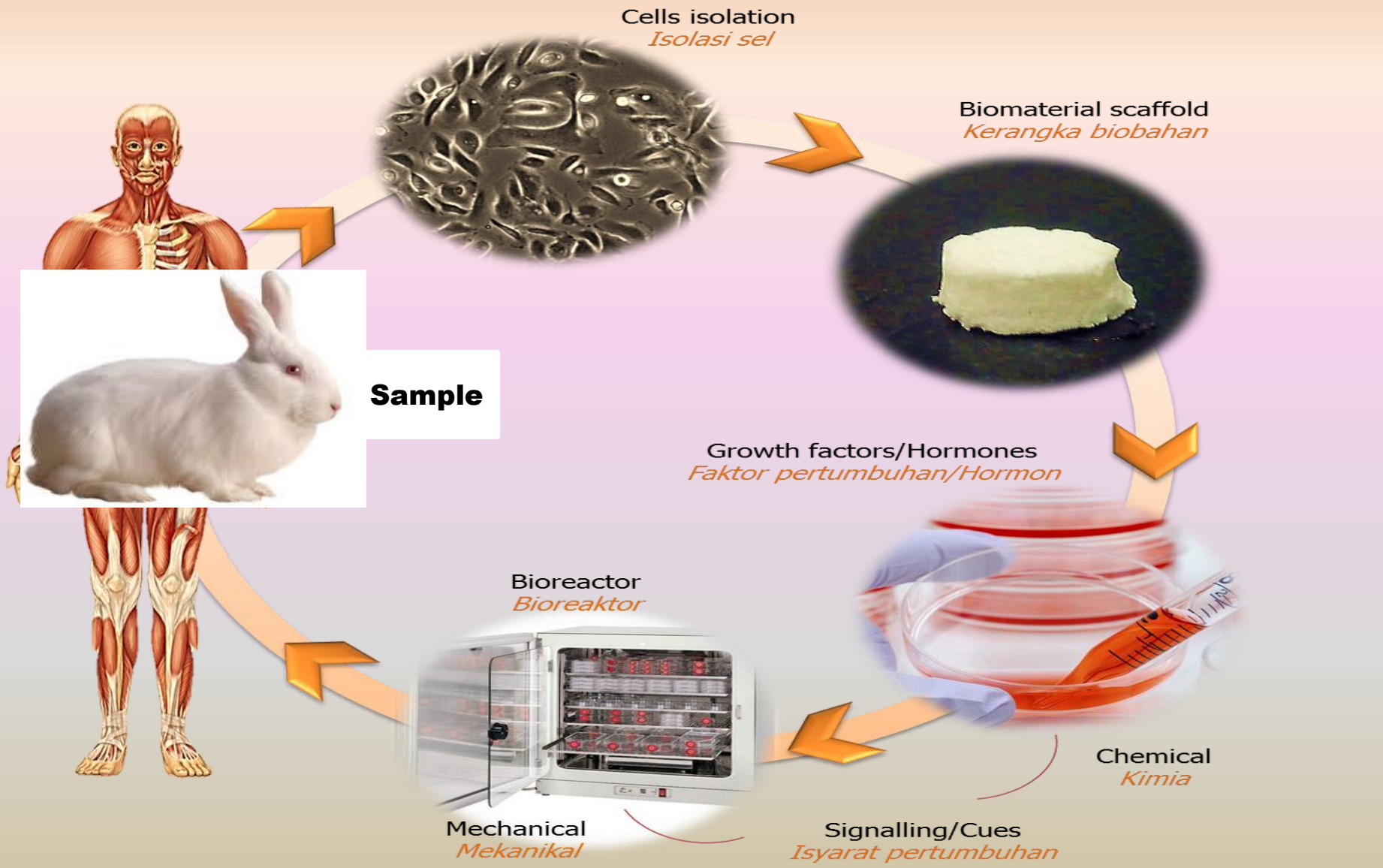

Research Statement

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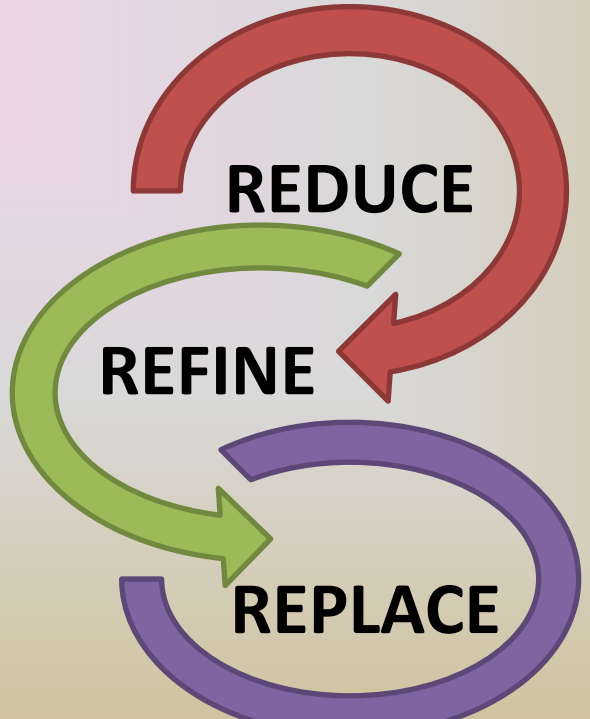

Computerized Tomography (CT) Scanning

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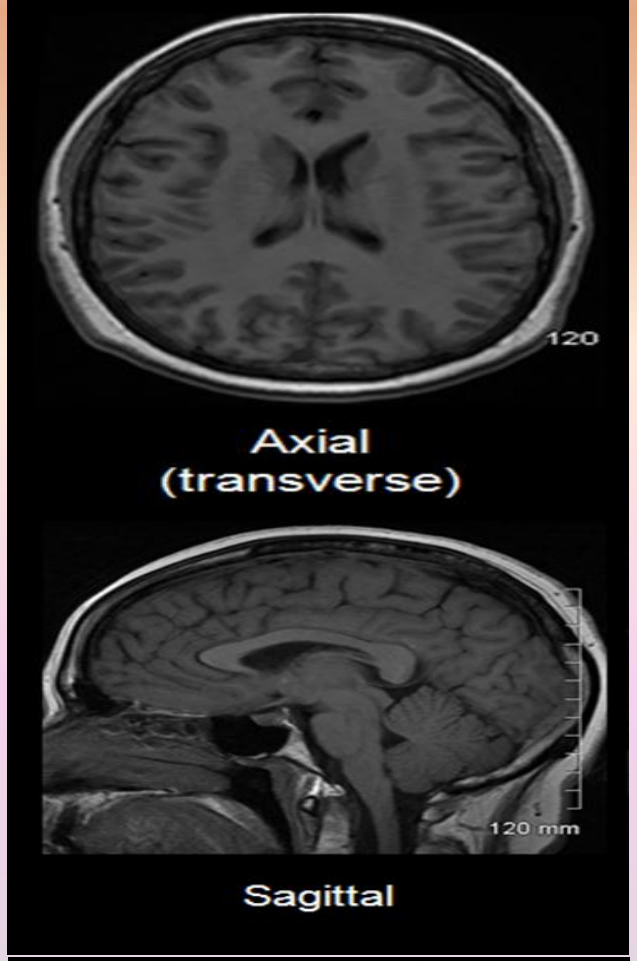
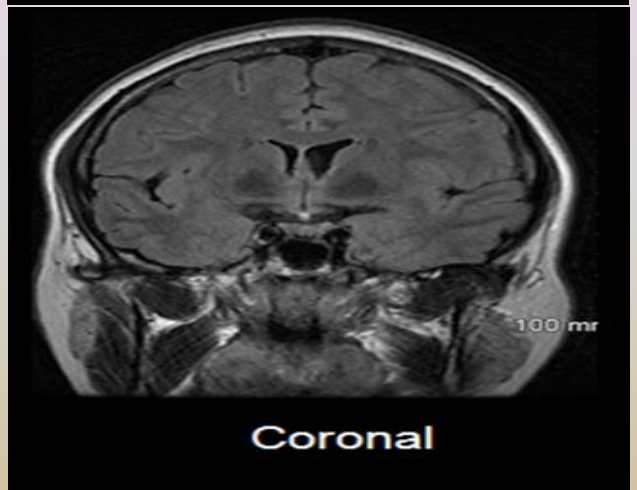
CT SCAN

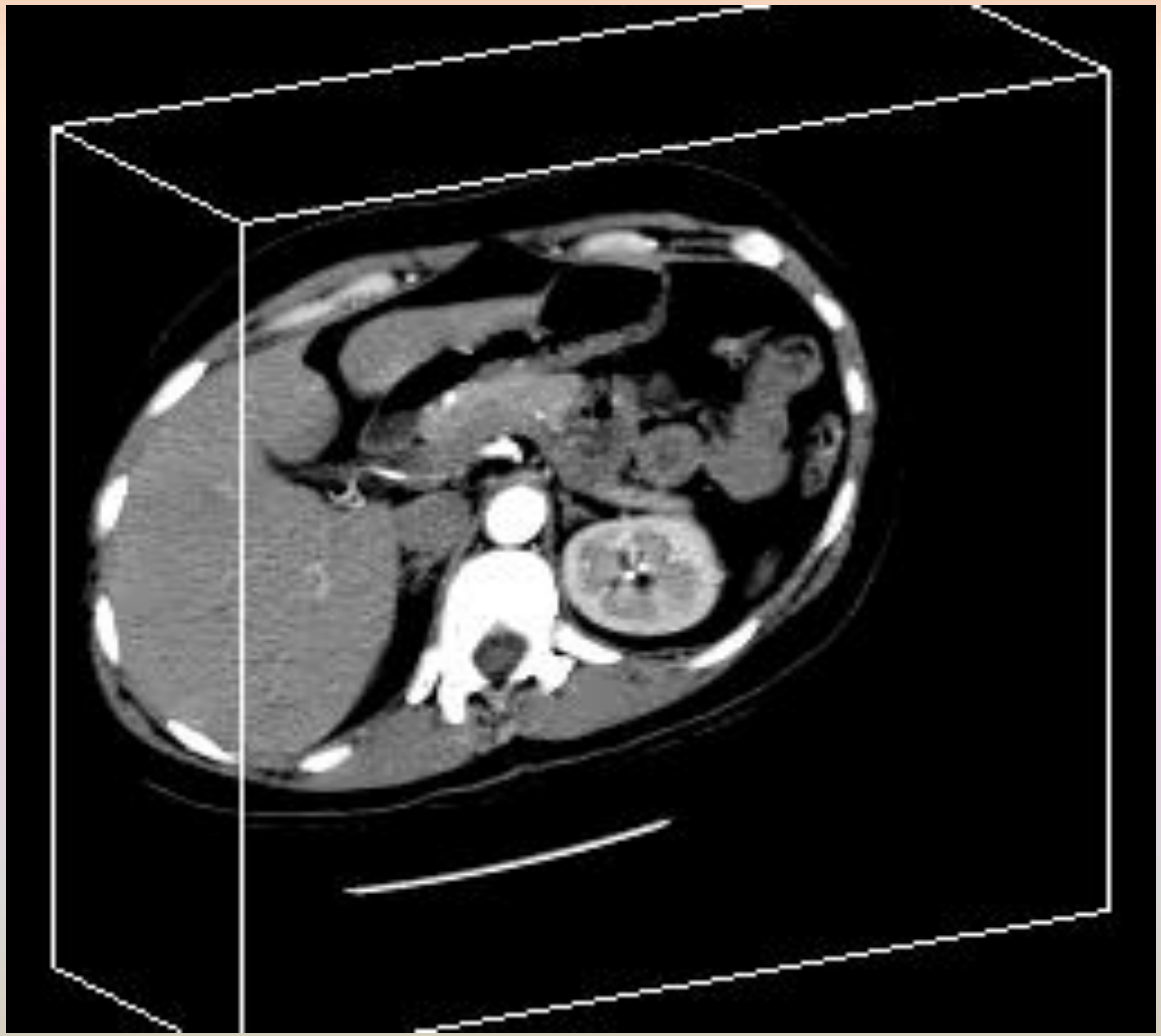
https://www.haltonhealthcare.on.ca/programs-and-services/diagnostic-imaging/services.html

MICRO CT SCAN

http://www.phenogenomics.dentistry.ubc.ca/equipment/MicroCTInVivoScanner/







https://sites.google.com/a/wisc.edu/neuroradiology/image-acquisition/the-basics

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Methodology

Research Ethical Approval

Approval No: IIUM/IACUCAPPROVAL/2015/(5)(24)

Cell Culture → PLGA Fabrication

- PLGA
- PLGA/ Fibrin
- PLGA/ Cell
- PLGA/ Fibrin/ Cell

SCANNING PROCESS

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Positioning of the TECs on CT scan table

Topogram scanning

Imaging Parameters:

- kVp: 80kVp
- mAs: 11 mAs
- Acquisition: Spiral acquisition
- Slice Thickness: 0.1mm

Visualization of TECs images Kernel: Sharp Kernel

Manipulation of TECs images: IVUS/ 3D Segmentation

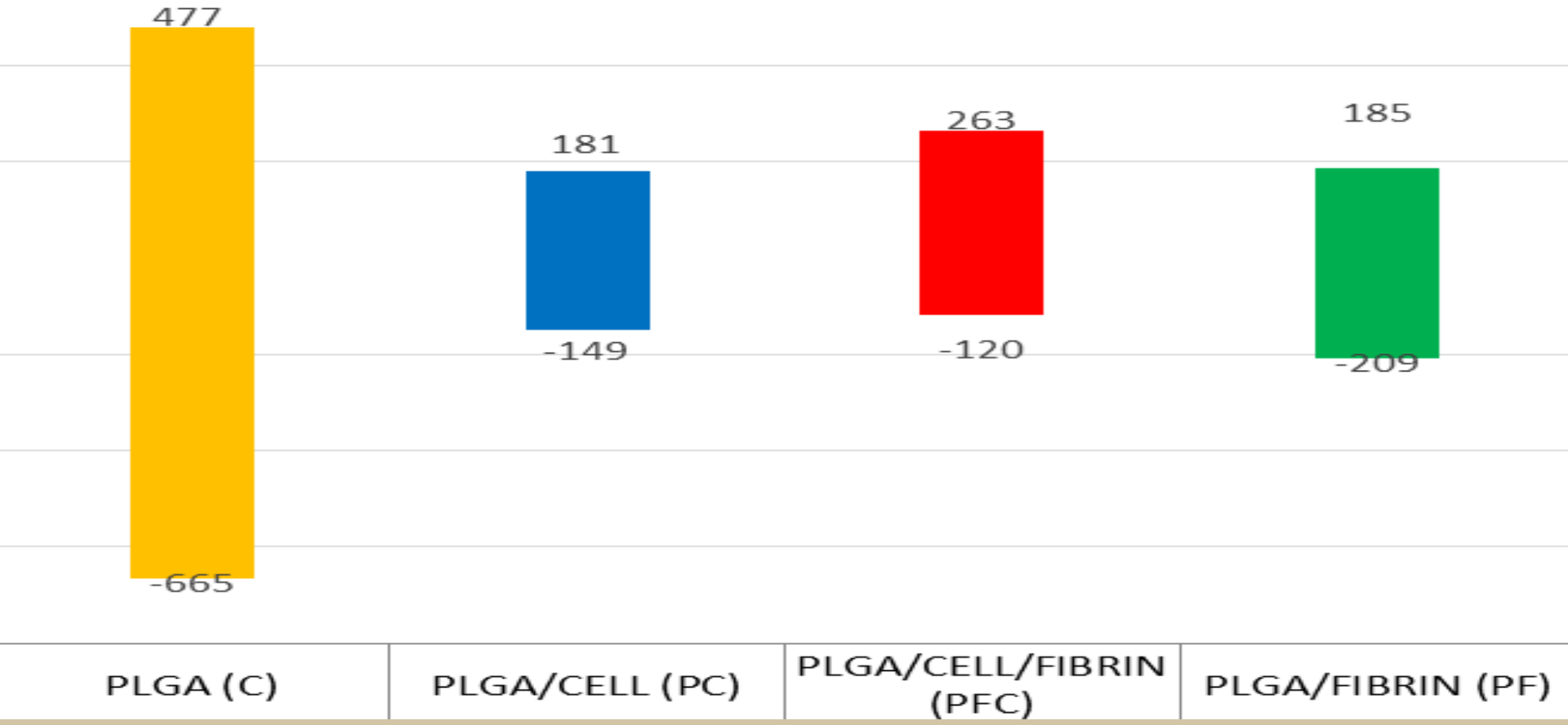
Image Appreciation

Extracting Data:

- Hounsfield Unit (HU)
- Colour Coding

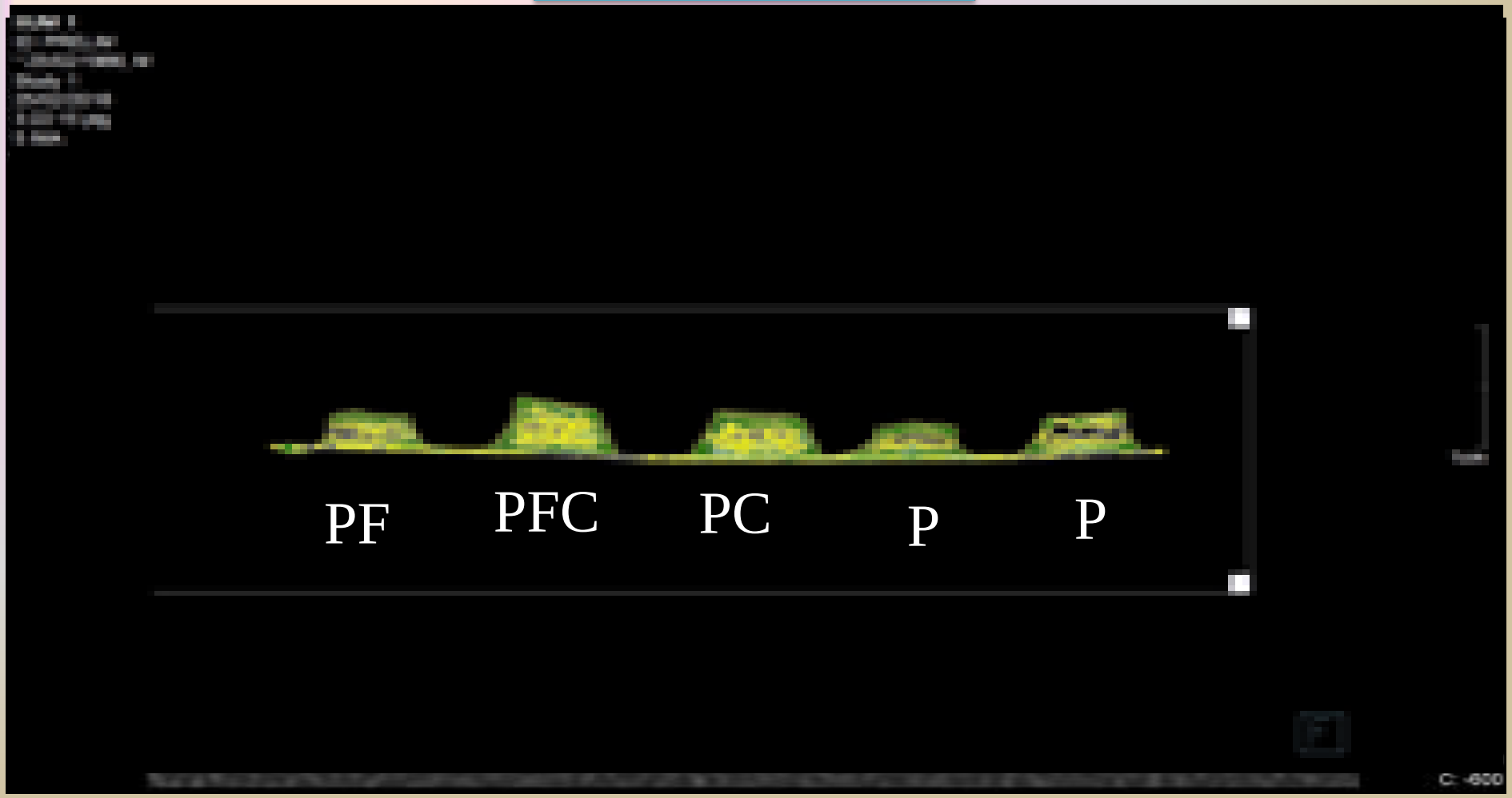
Results

DISCUSSION



Differences in TECs visualization

IVUS Software Dataset



- ✓The fabrication of scaffold will be kept constant in term of size and weight.
- ✓Cultured cell will be subjected to Ct scan at their various passages.
- ✓All the data collected during CT scan will be evaluated to find any relation with the lab analysis.
- ✓Experimental condition will be refined to exclude possibility of cell death.

Conclusion

- The CT values documented suggest that there are differences in attenuation values between the different types of TECs
- The use of intravascular ultrasound (IVUS) software installed in the CT system was found to be useful in appreciating the different compositions within the scanned samples

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- ✓ International Islamic University Malaysia, Kuantan Campus
- ✓ Ministry of Science, Technology and Innovation (MOSTI) Malaysia (06-01-08-SF0238/SF14-012-0062).
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THANK
YOU

3D PLGA SCAFFOLDS