

XXI B-MRS Meeting

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B-MRS
Meeting
October 1st to 5th



BRAZILIAN MATERIA
RESEARCH SOCIET

Maceió-AL, Bra

October 1st to 5th, 2023

Booklet

Presentation
Schedule

Mobile
App

until April 17 th May 1 st Submission of Abstracts	June 06 th June 25 th Abstract status notification	until June 19 th June 29 nd Submission of Revised Abstract	June 26 th July 07 th Final Abstract Notificatio n	until July 26 th Submission for Student Awards
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Amount R\$ 70.00 - payment via PIX. The poster will be available at the Poster Help Desk at the Conference on Monday morning, October 2nd - 9am.

Request for resources from FAPESP

Researchers from the State of São Paulo (BR) might be eligible for financial support from FAPESP. More information in the link below.

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Welcome

The **Brazilian Materials Research Society (B-MRS)** and the **Committee of the XXI B-MRS Meeting** invite the worldwide community of materials research to attend the 2023 Meeting to be held at the Ruth Cardoso Cultural and Exhibition Center in **Maceió-Alagoas, Brazil, October 1st to 5th, 2023.**

This traditional forum is dedicated to recent advances and perspectives in materials science and related technologies. It will be an excellent opportunity to bring together scientists, engineers and students from academy and industry to discuss the state of the art of Materials Science discoveries and perspectives.

Maceió is one of the main Brazilian capitals that has received many tourists mainly due to the receptivity of its inhabitants, the beaches with warm waters and extraordinary gastronomy. We very well welcome to Maceió. Do not miss this opportunity.

Organizing Committee



Carlos Jacinto da Silva
Chair

Institute of Physics,
Universidade Federal de Alagoas



Mário Roberto Meneghetti
Chair

Institute of Chemistry and
Biotechnology, Universidade
Federal de Alagoas

Design of bone-mimetic collagen/K-carrageenan based scaffolds for investigating bone mineralization

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In this study, we used collagen to fabricate mineralized scaffolds mimicking the microenvironment of the native bone. The sulphated polysaccharide κ -carrageenan (κ -Carr), extracted from renewable sources, was added to the scaffolds to fulfil the role of glycosaminoglycans, due to the similarity of their chemical structure, in the organization of the extracellular matrix and cell attachment.^{1,2} Ordered matrices were obtained by self-assembling type I collagen molecules in highly aligned fibrils by slow evaporation of acidic solutions at high concentrations.³ Fibrillogenesis was promoted from exposition in ammoniac vapours for 24 hours. Scanning electron microscopy images showed a surface formed by a dense and uniform network of intertwined fibrils, while from a side view, it was observed collagen fibrils ordered in a parallel alignment, which is characteristic of dense connective tissues. The incorporation of 5 wt.% κ -Carr promoted changes in the surface morphology but, the presence of collagen fibrils was still observable. After 7 days of culture, MC3T3-E1 osteoblasts were viable both in the absence and in the presence of κ -Carr. The presence of κ -Carr in the collagen scaffolds stimulated the maturation of the cells to a mineralizing phenotype, as suggested by the overexpression of key genes related to bone mineralization, including alkaline phosphatase (Alp), bone sialoprotein (Bsp), osteocalcin (Oc), and osteopontin (Opn), as well as the ability to mineralize the extracellular matrix after 14 and 21 days. The results indicate that these scaffolds can constitute an appropriate model to study the role of the structural organization of bone-mimetic synthetic matrices in cell function. Acknowledgements: This work was supported by FAPESP (2018/25871-8). References: (1) de Wildt, B. W. M. et al. Curr. Opin Biomed Eng. 2019, 10, 107–115. (2) González Ocampo, J. I. et al. Acta Biomater 2019, 83, 425–434. (3) Giraud Guille, M. M. et al. Soft Matter 2010, 6, 4963–4967.