

Universidade de São Paulo
Instituto de Física de São Carlos

XII Semana Integrada do Instituto de
Física de São Carlos

Livro de Resumos

São Carlos
2022

Semana Integrada do Instituto de Física de São Carlos

SIFSC 12

Coordenadores

Prof. Dr. Osvaldo Novais de Oliveira Junior

Diretor do Instituto de Física de São Carlos – Universidade de São Paulo

Prof. Dr. Javier Alcides Ellena

Presidente da Comissão de Pós Graduação do Instituto de Física de São Carlos – Universidade de São Paulo

Profa. Dra. Tereza Cristina da Rocha Mendes

Presidente da Comissão de Graduação do Instituto de Física de São Carlos – Universidade de São Paulo

Comissão Organizadora

Adonai Hilario

Arthur Deponte Zutião

Elisa Goettems

Gabriel dos Santos Araujo Pinto

Henrique Castro Rodrigues

Jeffer Santiago Mares

João Victor Pimenta

Julia Martins Simão

Letícia Martinelli

Lorany Vitoria dos Santos Barbosa

Lucas Rafael Oliveira Santos Eugênio

Natasha Mezzacappo

Paulina Ferreira

Vinícius Pereira Pinto

Willian dos Santos Ribela

Normalização e revisão – SBI/IFSC

Ana Mara Marques da Cunha Prado

Maria Cristina Cavarette Dziabas

Maria Neusa de Aguiar Azevedo

Sabrina di Salvo Mastrantonio

Ficha catalográfica elaborada pelo Serviço de Informação do IFSC

Semana Integrada do Instituto de Física de São Carlos
(12: 10 out. - 14 out. : 2022: São Carlos, SP.)
Livro de resumos da XII Semana Integrada do Instituto de Física de São Carlos/ Organizado por Adonai Hilario [et al.]. São Carlos: IFSC, 2022.

446 p.

Texto em português.

1. Física. I. Hilario, Adonai, org. II. Título

ISBN: 978-65-993449-5-4

CDD: 530

PG205

Nanomedicine applied to acute myeloid leukemia treatment via Macrophages CD44 receptors

ANTONIO, Luana; RIBOVSKI, Laís; ZUCOLOTTTO, Valtencir

luana.antonio@usp.br

Leukemic cells recruit macrophages and induce pro-leukemic phenotypes. Known as leukemic-associated macrophages (LAMs), the macrophages promote cancer progression and drug resistance, correlated with poor prognosis. (1) Nevertheless, LAMs intrinsic targeting to cancer cells also allows them to act as transporters of nanocarriers (NCs). We proposed to explore the binding between hyaluronic acid (HA) and CD44, a receptor that mediates cell-cell and cell-matrix interaction, to transport a nanotherapeutic to the leukemic cells. (2-3) To assess the macrophages' ability to effectively deliver NCs via CD44-targeting to acute myeloid leukemia (AML) cells, we studied their interaction with NCs in co-cultures of macrophages and AML cells. Three configurations of NCs based on poly (lactic acid-co-glycolic acid) (PLGA) were evaluated: i) NCs modified with polyethylene glycol (PEG), to evade the immune system; ii) NCs modified with HA, CD44-HA binding and iii) non-modified NCs (carboxyl moiety), which diameters are 179 ± 60 , 141 ± 28 and 136 ± 25 nm, respectively. Macrophages previously exposed to NCs were co-cultured with AML cells and the uptake and delivery of NCs to AML cells were analyzed by flow cytometry. PLGA-PEG-HA NCs were more internalized by pro-leukemic macrophages than non-induced or LPS-induced phenotypes, indicating specificity and in agreement with the upregulation of CD44 in pro-leukemic macrophages. Initial viability assays indicated that PLGA-PEG-HA NCs loaded with arsenic trioxide increase leukemic cell death as a result of the macrophages acting as bearer of the NCs.

Palavras-chave: Drug delivery. Macrophages. Leukemia.

Agência de fomento: FAPESP (2020/02386-7)

Referências:

- 1 LI, Y. *et al.* The role of tumor-associated macrophages in leukemia. **Acta Haematologica**. v.143, n.2, p.112–117, 2020. DOI:10.1159/000500315.
- 2 RIOS DE LA ROSA, J. M. *et al.* The CD44-mediated uptake of Hyaluronic acid-based carriers in macrophages. **Advances Health Care Materials** v. 6, n.4, p.1–11, 2017. DOI:/10.1002/adhm.201601012.
- 3 XIA, Y. *et al.* Engineering macrophages for cancer immunotherapy and drug delivery. **Advanced Materials**. v. 32, n.40, p.1–20, 2020. DOI:/10.1002/adma.202002054.