Biocompatibility and cellular uptake of fluorescent chitosan nanohydrogels in murine macrophages and B lymphocytes

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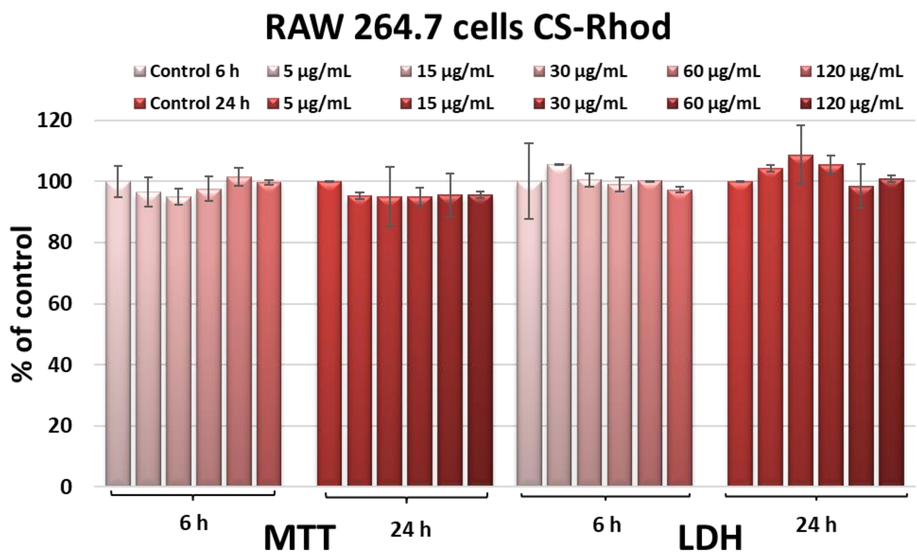
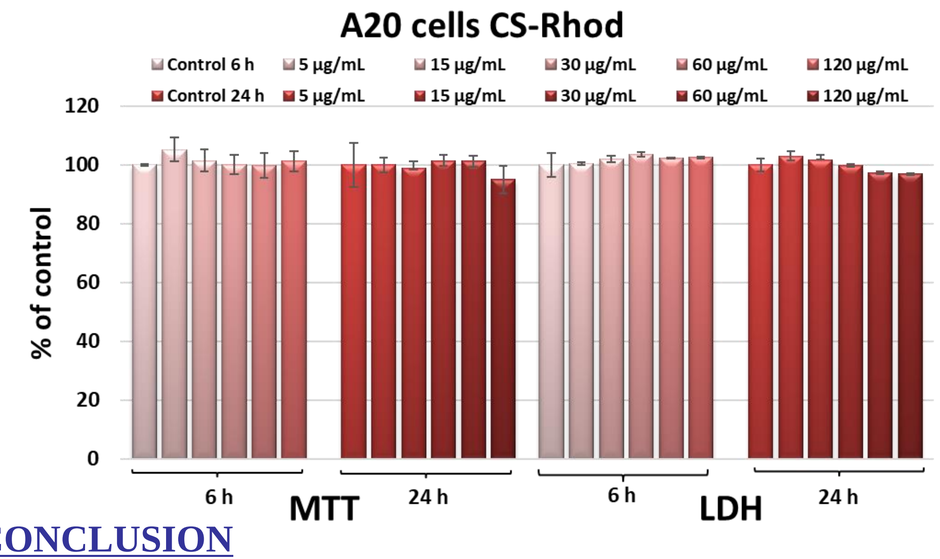
INTRODUCTION

- ✓ Due to their intrinsic viscosity and hydrophilicity, **nanohydrogel systems** are used to significantly increase the efficiency of commercial contrast agents for MRI and thus effectively improve the sensitivity of the MRI technique.
- ✓ Since **chitosan (CS)** is a biocompatible polysaccharide frequently used in biomedical applications, we aimed to prepare chitosan nanohydrogels (NGs) by ionic gelation, the polysaccharide being further grafted with **rhodamine (Rhod)** and **fluorescein isothiocyanate (FITC).**

EXPERIMENTAL PROCEDURE

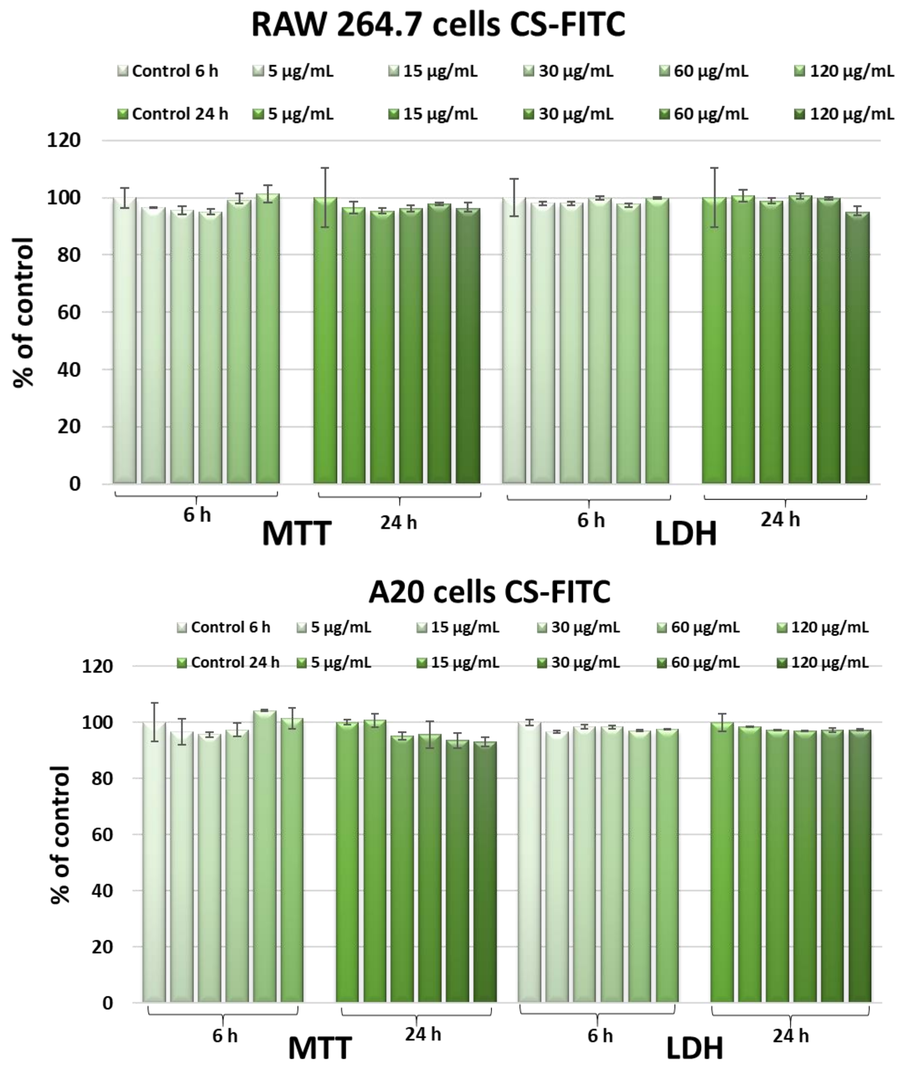
- ✓ In this way, the cytotoxic effect of different concentrations (5, 15, 30, 60 and 120 µg/mL) of the fluorescent CS-FITC and CS-RBITC NGs was investigated by assessing the plasma membrane integrity and the metabolic activity of RAW 264.7 murine macrophages and A20 mouse lymphoma B cells following exposure for 6 and 24 hours.
- ✓ The **cell viability** (MTT assay) and **lactate dehydrogenase activity** were analyzed by spectrophotometric methods, while cellular uptake was observed by fluorescence microscopy.



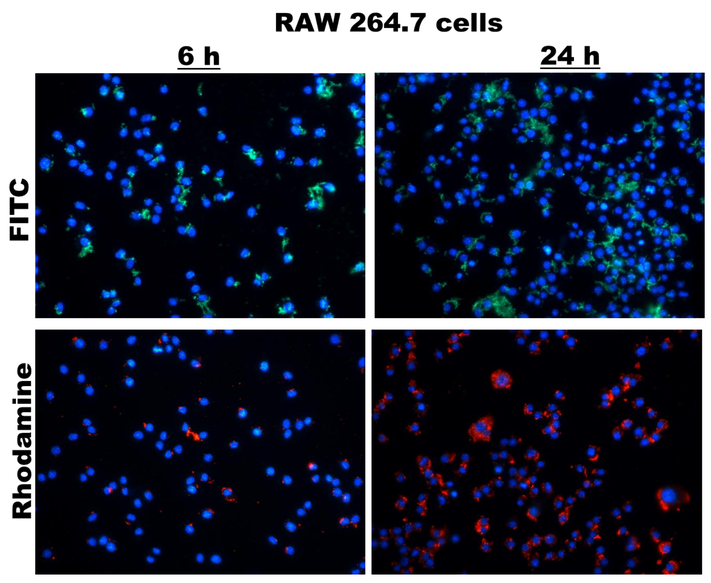


RESULTS

Our results showed that the exposure to CS-FITC and CS-RBITC NGs for 6 and 24 hours did not induce significant changes to RAW 264.7 and A20 cells compared to control, proving a good nanogel biocompatibility for both cell lines.



In addition, the fluorescence microscopy showed that cellular uptake was quite rapid and efficient for the NGs tested.



CONCLUSION

Taking all of these into consideration, we can conclude that all types of nanohydrogels were biocompatible, being internalized in both cell types with predominantly cytoplasmic localization.

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