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Abstracts are presented in the author's edition with minimal technical corrections.

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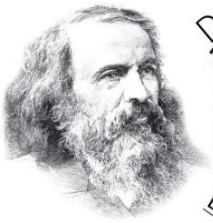

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SOFT POLY(ε-CAPROLACTONE)-BASED CORE-SHELL NANOPARTICLES

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The development of new therapeutic approaches against tuberculosis represents the important task of modern medicinal chemistry. Both, development of more effective drug molecules and drug delivery systems are on demand to win the battle with this widespread disease [1]. Regarding advances in drug delivery systems, the development of formulations capable for encapsulation and controlled release of two or three antimycobacterial agents is on demand. Core-shell nanoparticles (NPs) possessing a hydrophobic core and a hydrophilic hydrogel-like shell represents a perspective variant of nanoformulations for local treatment of lung tuberculosis with application of nebulizer. Such NPs may allow co-encapsulation of different molecules both into the core and shell. The shell can also be modified with peptide ligands necessary for targeting or mucoadhesion. Its was recently shown, that such shell could affect the drug release from the core of particles [2]. We also propose that the thickness of such shell could help to regulate particles stiffness, which is currently believed to be an important factor affecting biointeractions of particles with biological surrounding [3].

In present study we have obtained poly(ε-caprolactone) NPs (PCL NPs) and form the shell on their surface with application of biocompatible polyelectrolytes – chitosan (Chit) and hyaluronic acid (HA). Positively charged Chit was first covalently attached to the surface of NPs and then oppositely charged HA was attached (Figure 1). Further layer-by-layer addition of polyelectrolytes allowed us to control the thickness of the shell and particles stiffness.

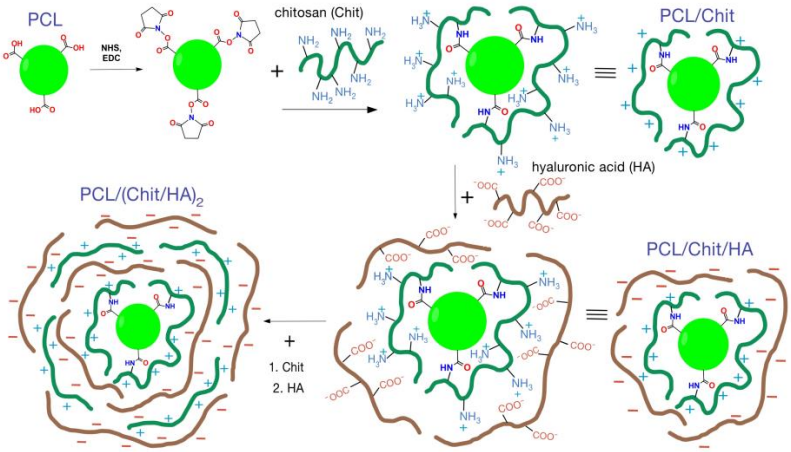

Figure 1. The strategy for shell formation on the surface of PCL NPs.

We have tested the effect of particles charge on their biocompatibility. It was shown that addition of hyaluronic acid reduces the toxicity of particles for the cells. Moreover, first experiments on drugs co-encapsulation showed that obtained nanoformulations are able to entrap both hydrophilic and hydrophobic drug molecules.

References

[1] *Front. Pharmacol.* **2021**, *12*, 749945
[2] *Pharmaceutics.* **2021**, *13(6)*, 801
[3] *Nanoscale*. **2017**, *9*, 454

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