## HYDROGEL NANOPARTICLES FOR SAFE THERAPEUTICAL RNAs DELIVERY

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The delivery of RNAs throughout the human body presents significant challenges due to the fragility of oligonucleotides, undergoing fast degradation, and their difficulty in cell internalization.

Nanostructures, known as nanocarriers, such as liposomes, polymeric, and inorganic nanoparticles, have been utilized for various types of RNAs. However, these systems face limitations related to their large size, stability issues, and potential toxicity. [1] An emerging and promising alternative in this area is the use of soft nanostructures, particularly hydrogel nanoparticles. These particles consist of a polymeric network that demonstrates promising efficiency in entrapping oligonucleotides. The choice of material is crucial, influenced by factors such as biocompatibility, non-toxicity, and the capacity to load a substantial amount of RNA molecules. [2,3] This study aims to synthesize several nanogels designed to either possess a positive surface charge, enabling interaction with negatively charged RNAs (Figure 1). Utilizing nanogels with these properties is expected to combine drugs and oligonucleotides delivery in specific environments with controlled release.



Figure 1: RNA-Nanogel complex

Key words: nanogels, biodegradable material, drug delivery, RNA, polymeric systems

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