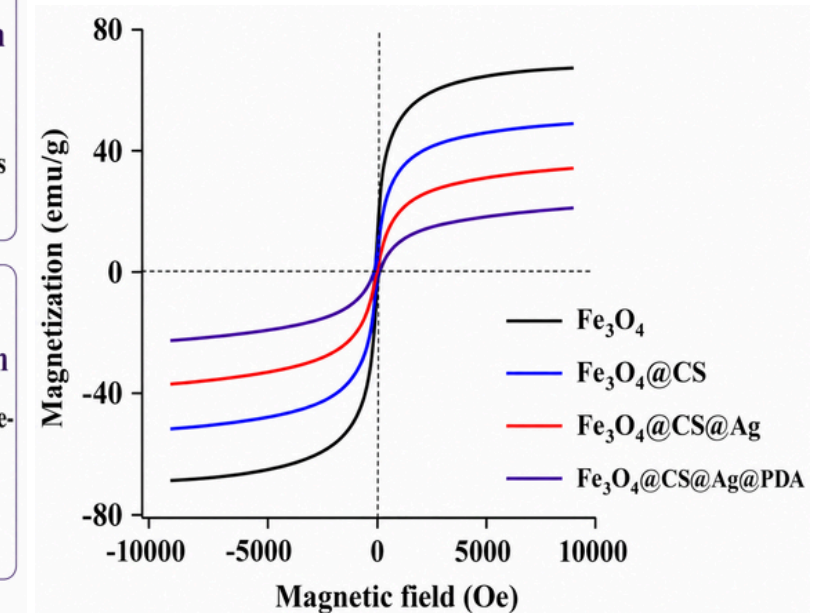
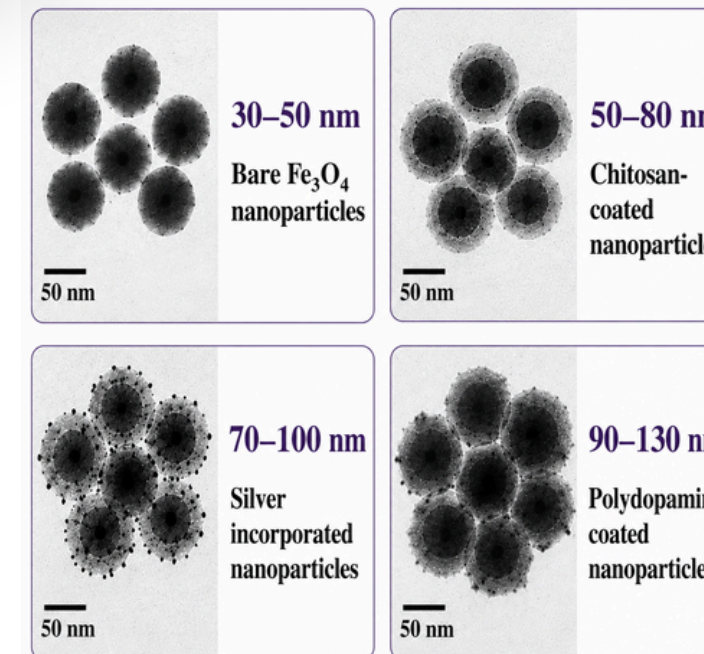
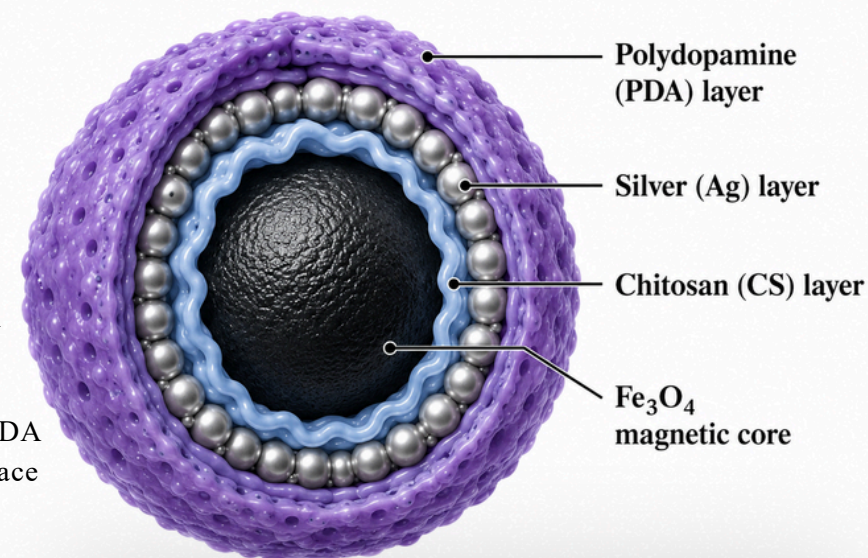
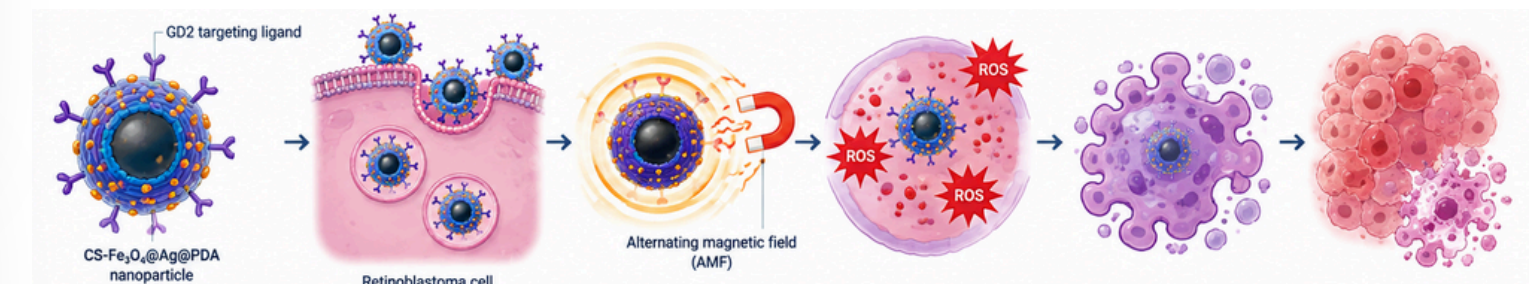


Chitosan-coated Fe₃O₄ nanoparticles offer biocompatibility, sustainable synthesis, functional surface properties, and potential antimicrobial activity.



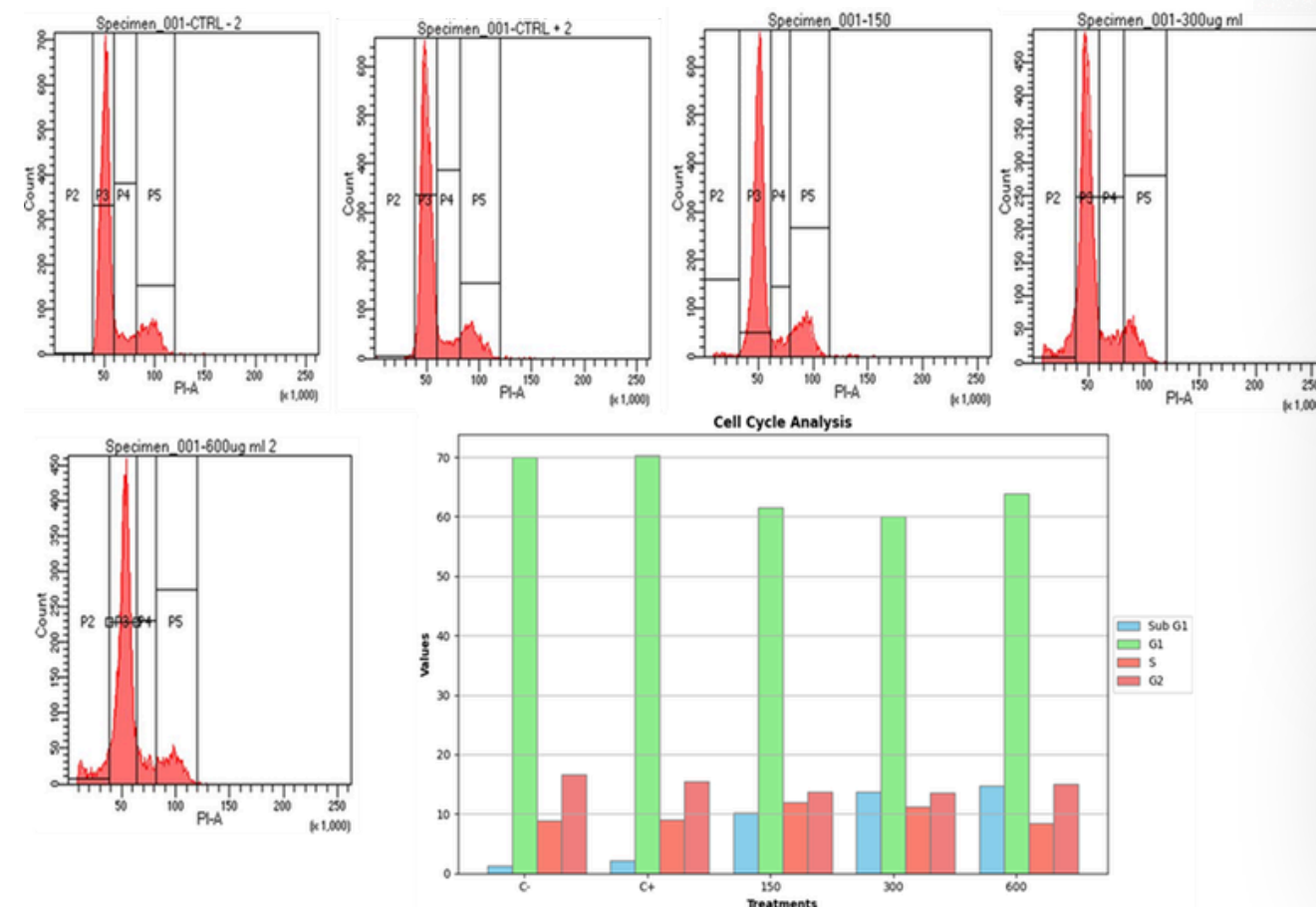
The final formulation demonstrated substantial magnetic responsiveness, supporting its investigation for magnetic hyperthermia applications.



GD2 targeting → Cellular uptake → Magnetic hyperthermia → ROS/oxidative stress → Apoptosis & cell-cycle arrest → Potential therapeutic response

- Multifunctional nanoparticle engineering enables targeted therapeutic approaches.
- Magnetic responsiveness provides opportunities for localized treatment activation.
- The platform represents a potential pathway toward precision nanomedicine applications.

BIOLOGICAL EVALUATION



The Fe₃O₄@CS@Ag@PDA platform represents an emerging theranostic strategy combining targeted delivery, localized treatment activation, and multifunctional therapeutic capability. Further investigation in translational models will determine its potential clinical applicability.

The integration of targeting mechanisms, magnetic responsiveness, and therapeutic functionality demonstrates the potential of multifunctional nanomedicine approaches to address current challenges in precision oncology

- Safety evaluation
- Biocompatibility assessment
- Translational model validation
- Manufacturing scalability

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