



Natural Cellulose–Chitosan Hydrogel for Sustained Local Docetaxel Delivery in Cancer Therapy

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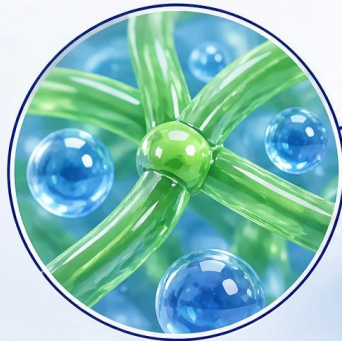
MULTISECTOR
INNOVATION
for ADVANCING
DELIVERY SCIENCE

JULY 6–9, 2026

Concepts:

1 HYDROGELS

A three-dimensional, cross-linked polymer network that absorbs and retains large amounts of water.



Cross-links

Chemical or physical junctions that connect polymer chains, forming a stable 3D network.



Polymer Chains

Long, flexible molecular chains that create the structural framework of the hydrogel.



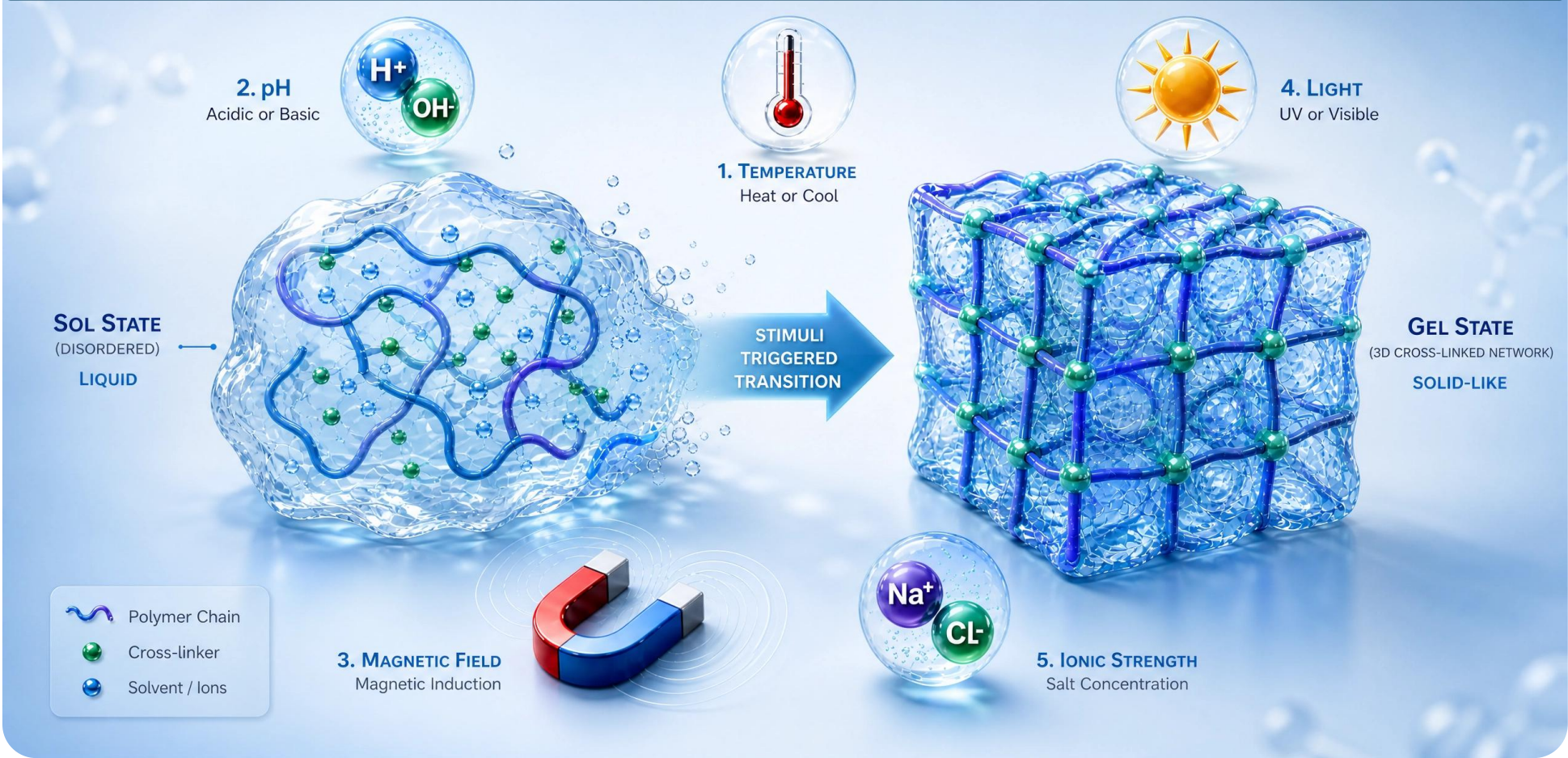
Water Absorption

Hydrophilic polymer network absorbs and retains water molecules within its structure.

Visuals designed with the assistance of Manus AI



Concepts: **2** STIMULI-RESPONSIVE HYDROGELS



Visuals designed with the assistance of Manus AI



Local Cancer Therapy:



Reduce systemic toxicity and Off-Target effects



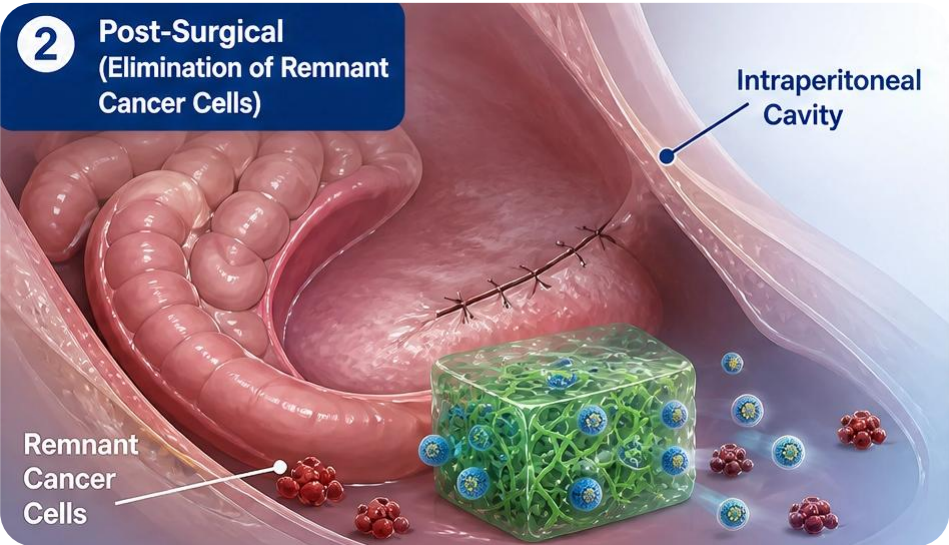
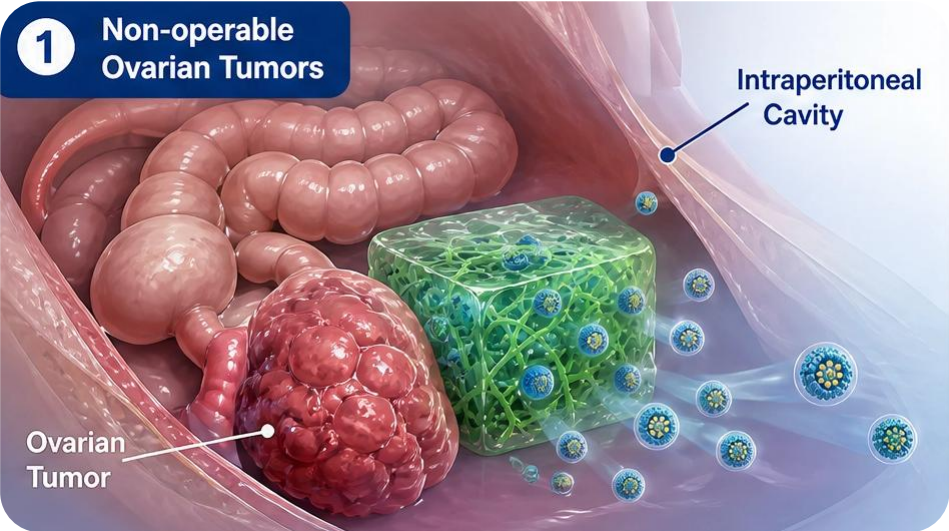
Allow a sustained and controlled release *in situ*



Reduce the number of administrations



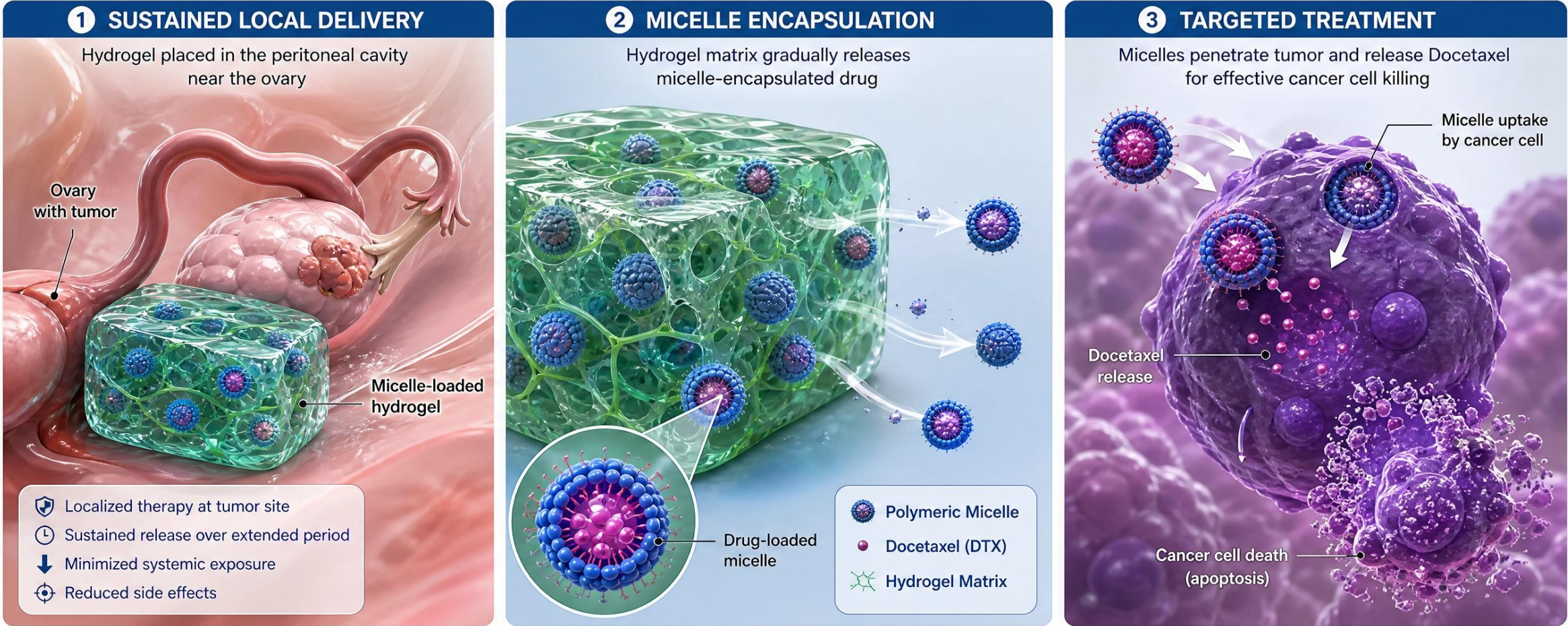
Increase therapeutic effectiveness and patient welfare



Visuals designed with the assistance of Manus AI



Objective:



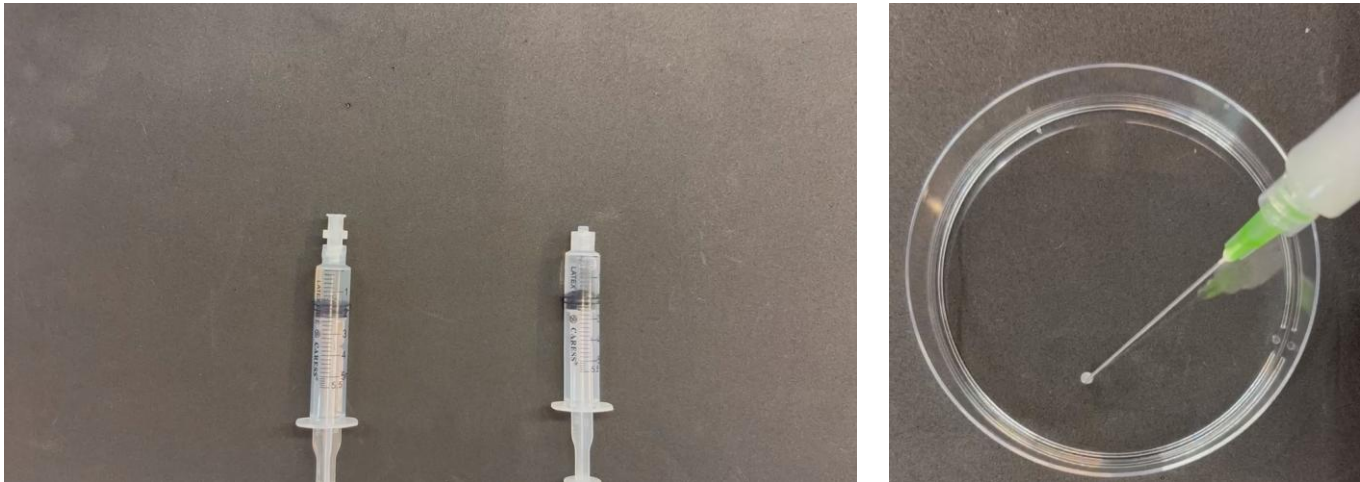
Visuals designed with the assistance of Manus AI



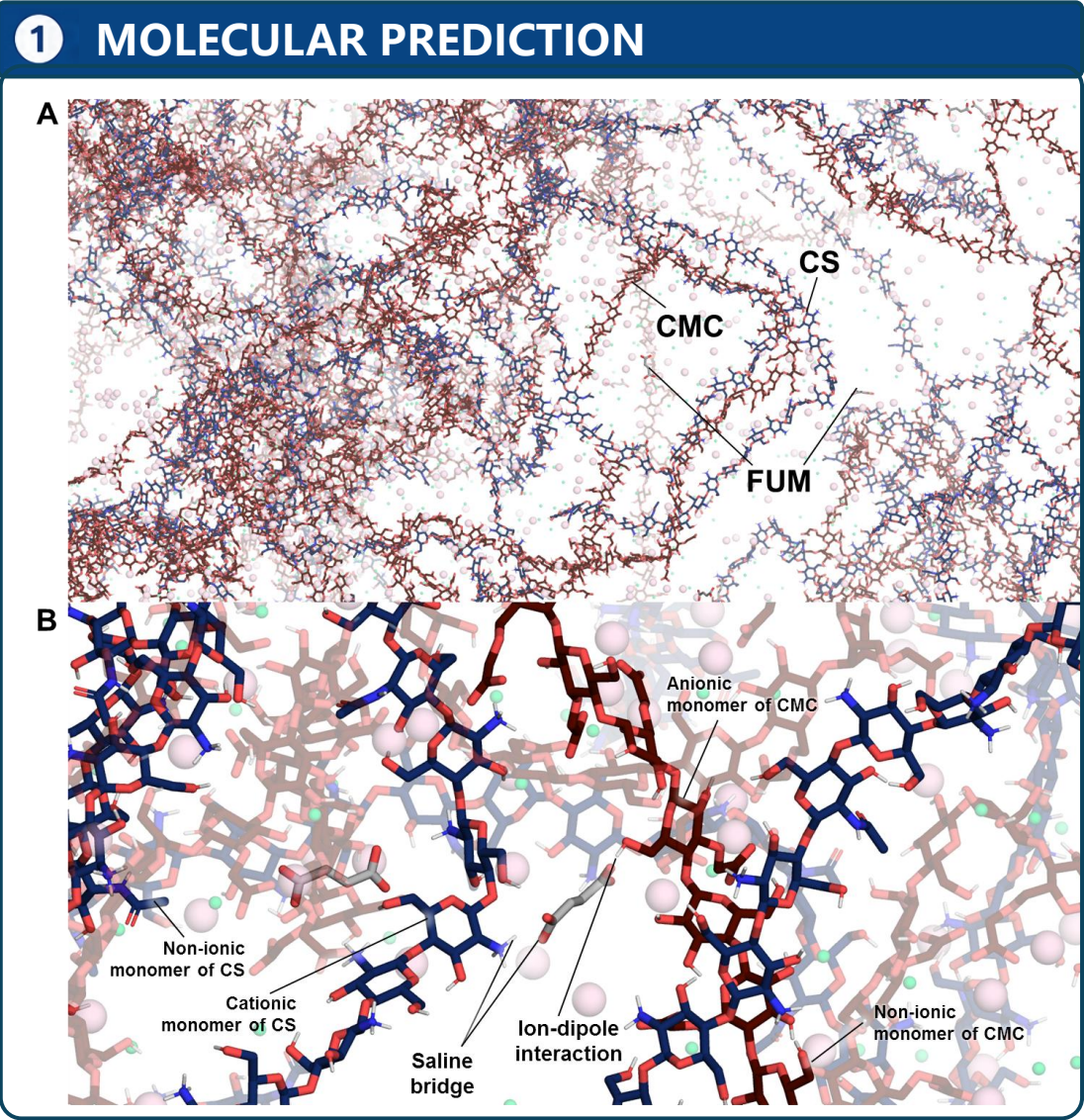
Results:

 Composition:

Chitosan + Carboxymethylcellulose + Fumaric Acid

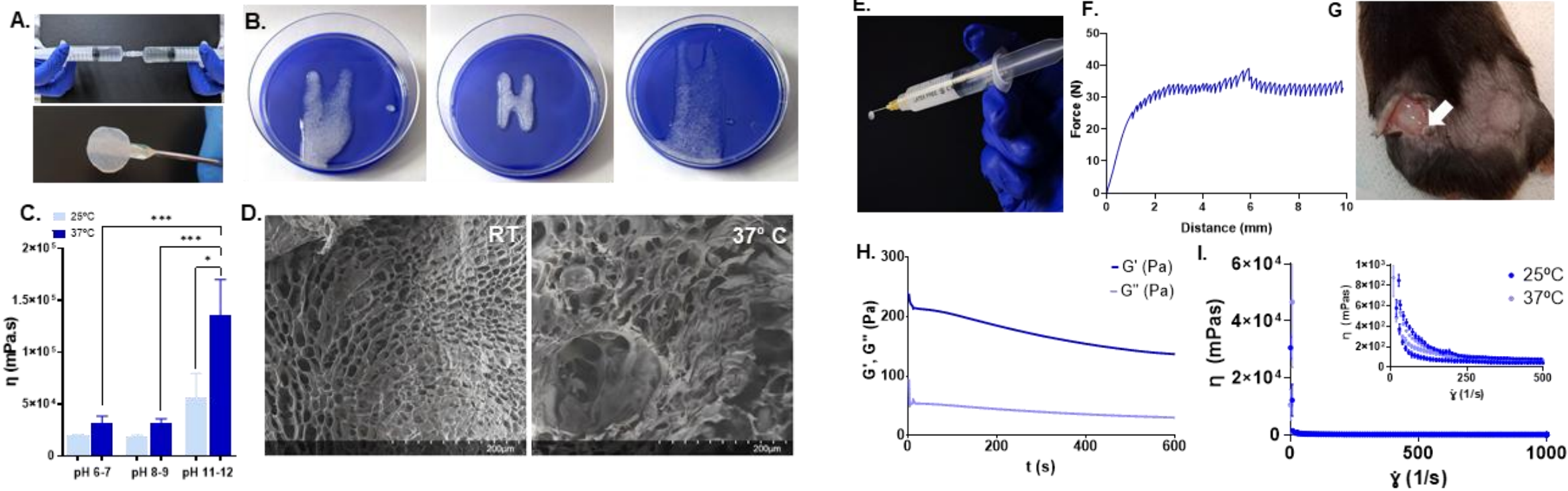


- Physically crosslinked Hydrogel
- Stronger interactions with time



Results:

2 PHYSICOCHEMICAL CHARACTERIZATION



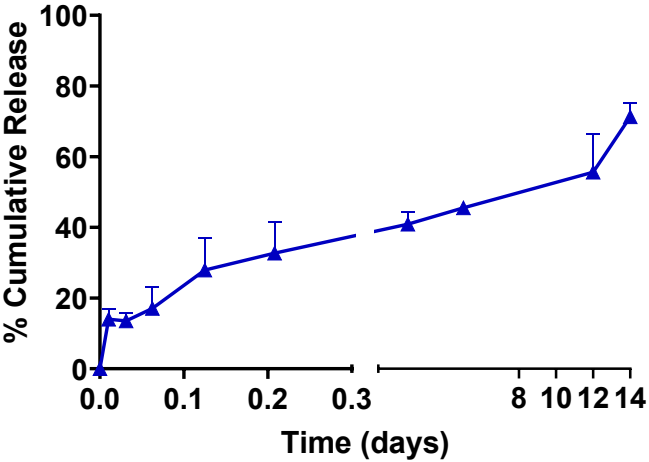
- pH-dependent gelation
- 3D porous morphology
- Injectable

- Thixotropic behavior: less viscous when shear is applied and recovers its structure and viscosity over time – **Depot System**



Results:

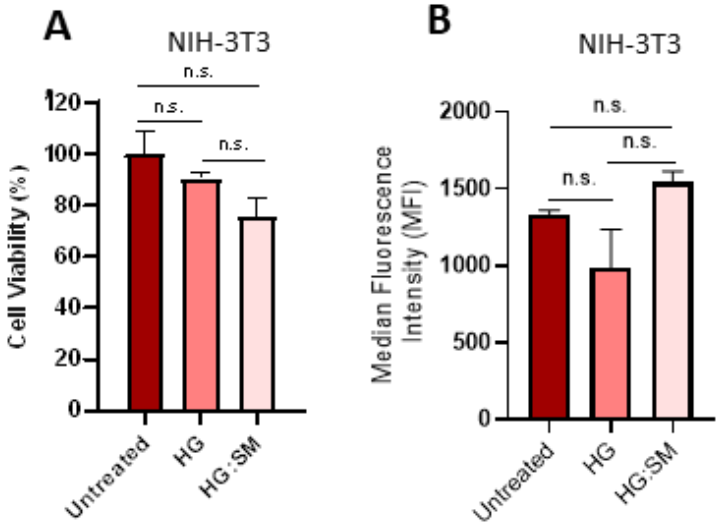
3 DRUG RELEASE



○ Sustained drug release

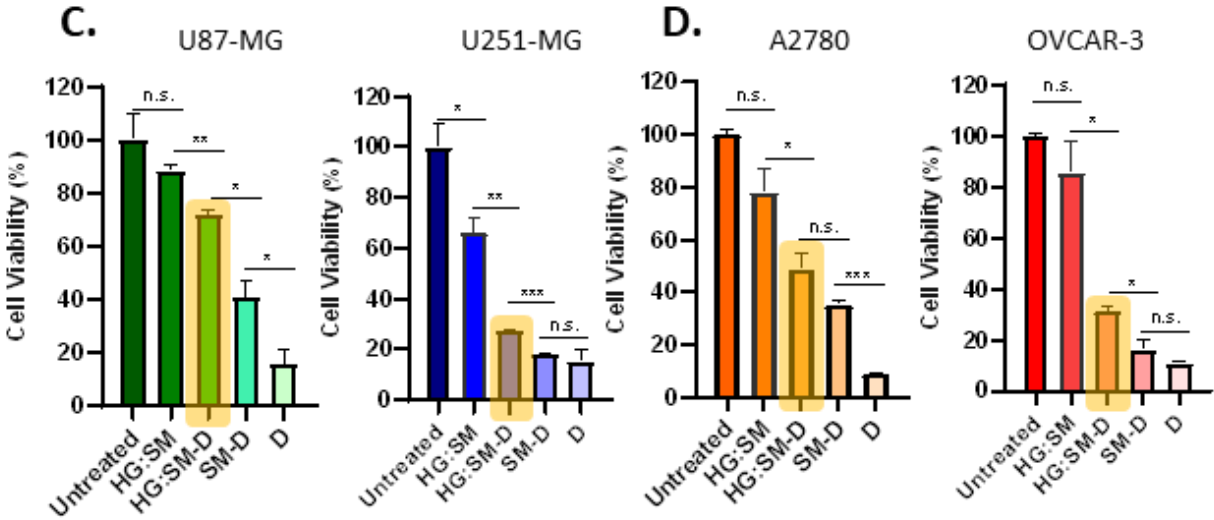
≈60% after 2 weeks

4 IN VITRO VALIDATION – 2D MODELS



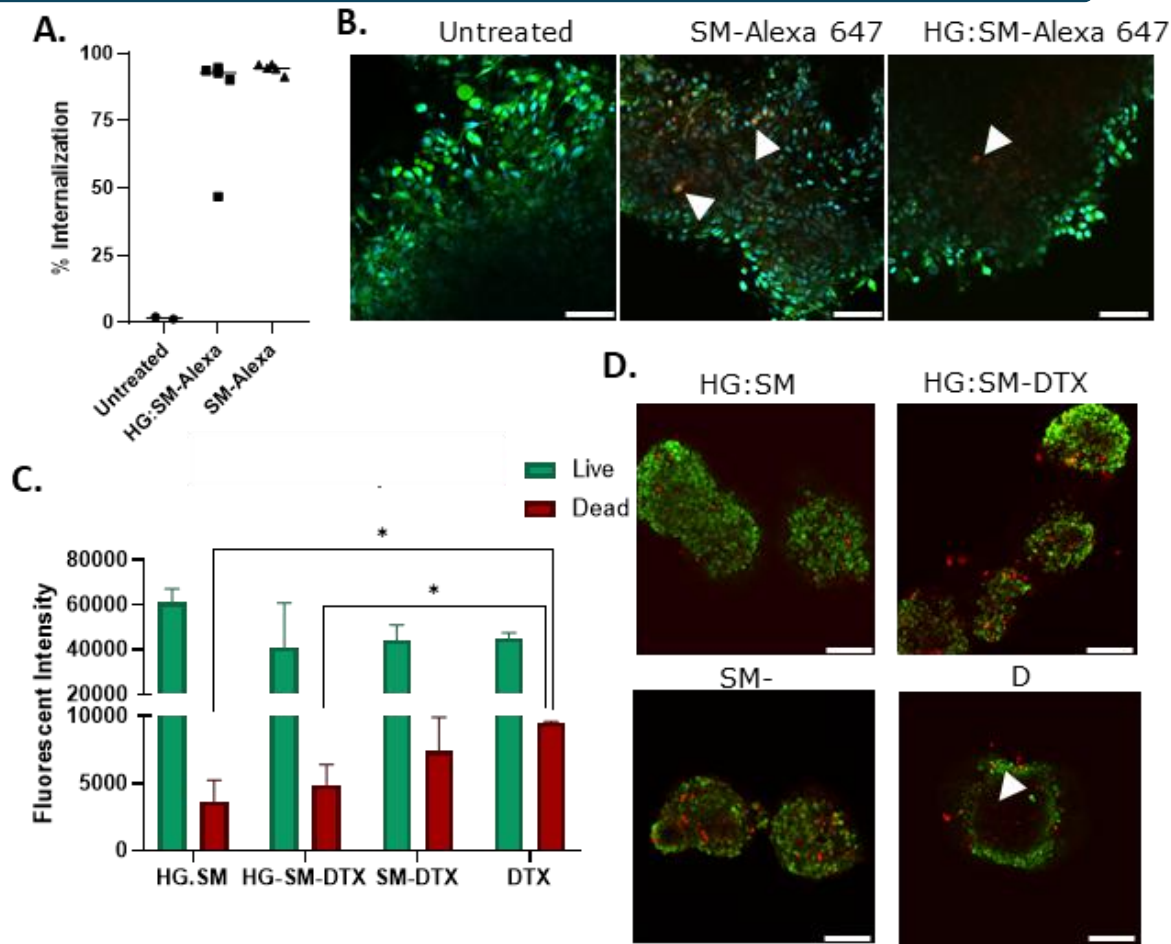
○ Biocompatible HG

○ Moderate cytotoxic effect at 72h, as expected, slower than the free or the encapsulated drug



Results:

5 IN VITRO VALIDATION – 3D MODELS



- Micelles released from the hydrogel penetrate 3D spheroids and promote cell cytotoxicity, lower than the free or the encapsulated drug



Carbohydrate Polymer Technologies and Applications
Volume 14, June 2026, 101120



Naturally-derived cellulose-chitosan soft-hydrogel for sustained local docetaxel micelles delivery: from in silico modeling to preclinical validation in ovarian and glioblastoma models

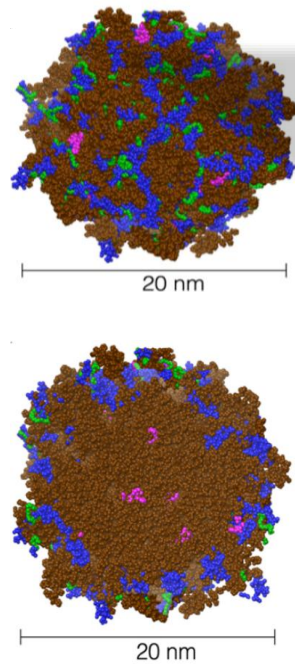
Magalí Sureda ^{a 1}, Giacomoluciano Vitelli ^{a 1}, Sofia Campos-Moreno ^a, Ogechi Dike Manica Malachy ^a, Júlia German-Cortés ^{a b}, Sergio José Peresson ^c, Guillermo Goode-Romero ^d, Fabian Ávila-Salas ^e, Narine Fischer-Albiol ^a, Vincenzo Montanarella ^{a f}, Marc Moltó Abad ^{a b}, Àngels Alcina-Milà ^a, Sandra Mancilla ^{a g h}, Belén García Prats ^{a g h}, Zamira V. Díaz-Riascos ^{a g h}, Antonella Accardo ⁱ, Roser Ferrer Costa ^{a j}, Simó Schwartz Jr. ^{a j}, Esteban Durán-Lara ^k, Joana Marto ^l...Diana Rafael ^{a g h * ✉}



Results:



POSTER Nº 458

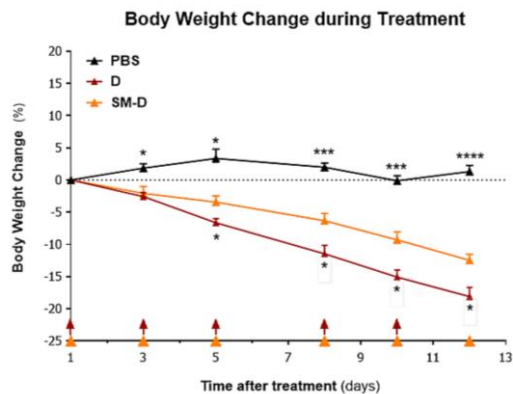
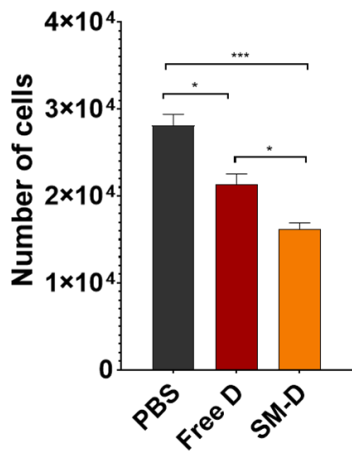


Journal of Controlled Release
Volume 381, 10 May 2025, 113616



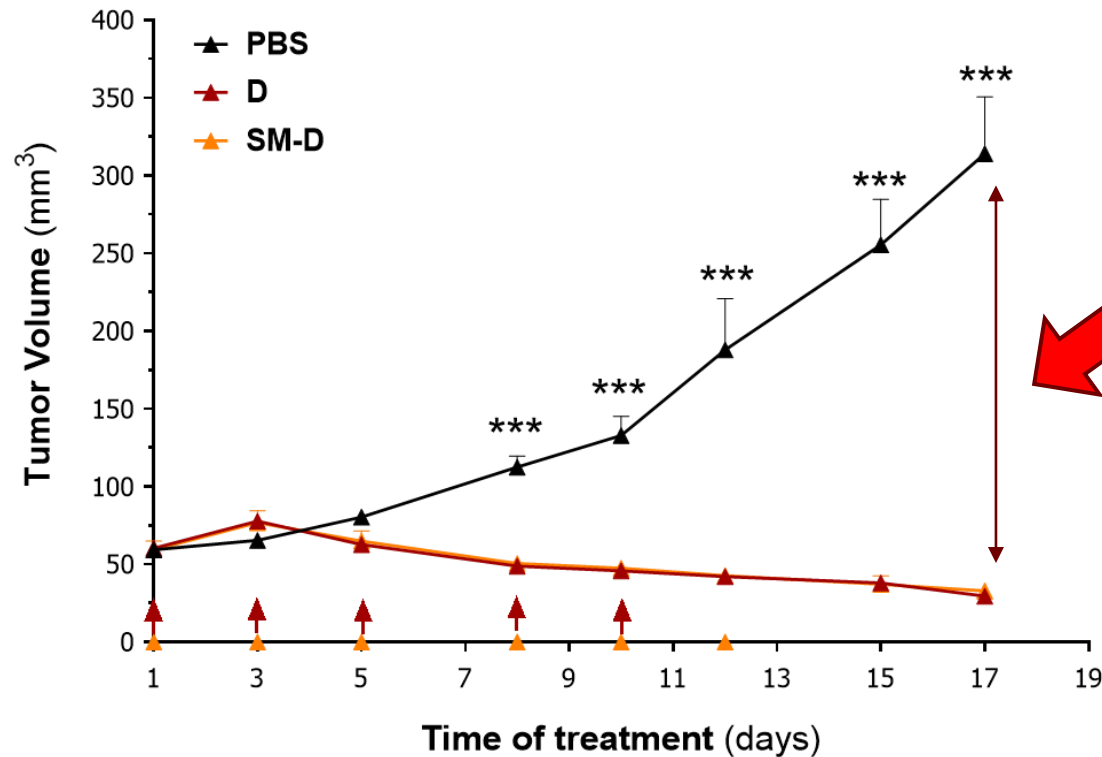
Preclinical evaluation of several polymeric micelles identifies Soluplus®-docetaxel as the most effective candidate in multiple glioblastoma models

Júlia German-Cortés ^{a b 1}, Raquel Herrero ^{a 1}, Natalia Torroglosa ^{a 1}, Alexandra Pumarola ^a, Narine Fischer-Albiol ^a, Sofia Campos-Moreno ^a, Sofia Sabaté ^a, Àngels Alcina ^{a c}, Sandra Mancilla ^{a c d}, Belén García ^{a c d}, Monserrat Llaguno-Munive ^e, Zamira V. Díaz-Riascos ^{a c d}, Clàudia Martins ^{f g}, Simó Schwartz Jr ^{a h}, Roser Ferrer-Costa ^{a h}, Ibane Abasolo ^{a c d h 2}, Pilar Sánchez-Gómez ⁱ, Bruno Sarmiento ^{f g j}, Diana Rafael ^{a c d}  , Fernanda Andrade ^{a c k}  



6 DOCETAXEL LOADING MICELLES

Tumor Volume Evolution during the treatment



Strong Tumor reduction, Lower Toxicity



Conclusions:

- Safe hydrogel
- Slow release of the cargo
- Therapeutic efficacy of the small amount of drug released
- Versatile platform for the local sustained release of chemotherapeutics

***In vivo* efficacy of the hydrogels on going!**



Acknowledgements:



CB-DDT
Clinical Biochemistry-Drug Delivery
& Therapy



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Institut de Recerca



Clinical Biochemistry, Drug Delivery & Therapy, VHIR, Barcelona



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asociación española
contra el cáncer

