Chitosan grafted with fibronectin as a building unit for bioactive thermosensitive hydrogels

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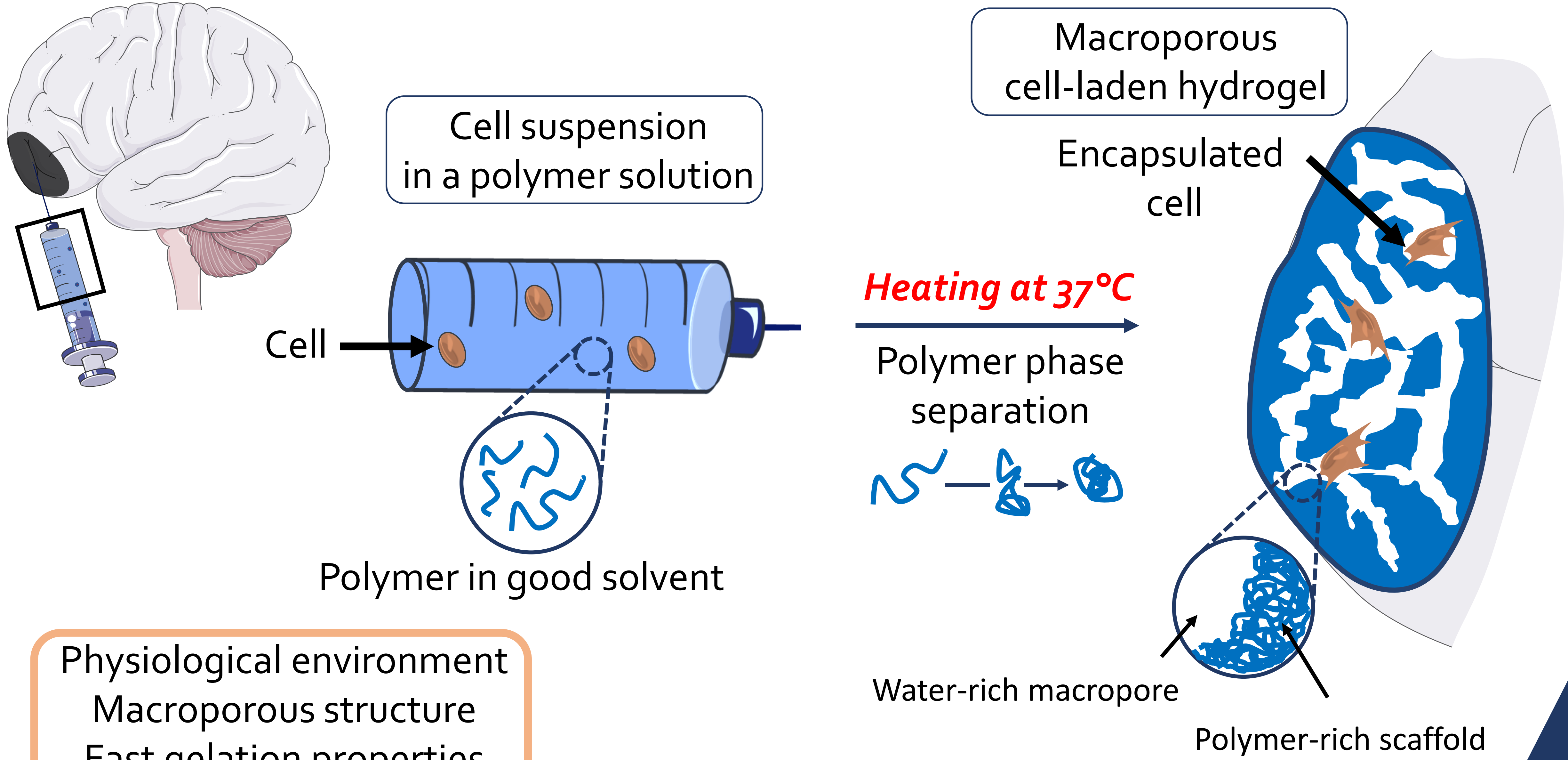
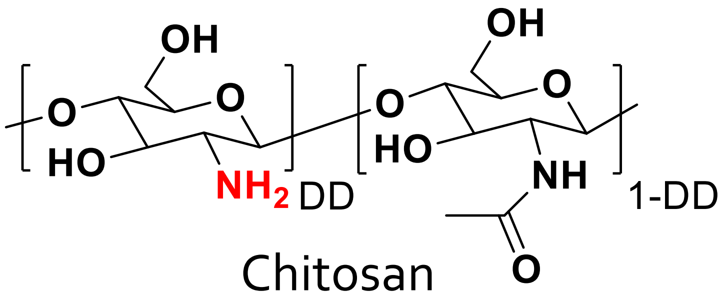
Injectable hydrogels for cell encapsulation and delivery

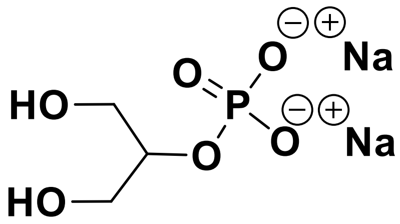


Physiological environment
Macroporous structure
Fast gelation properties

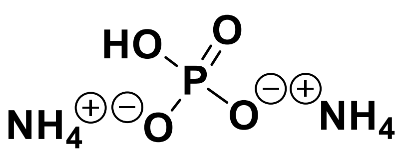
Chitosan/Phosphate salts thermosensitive solutions



Chitosan
(**CS**)

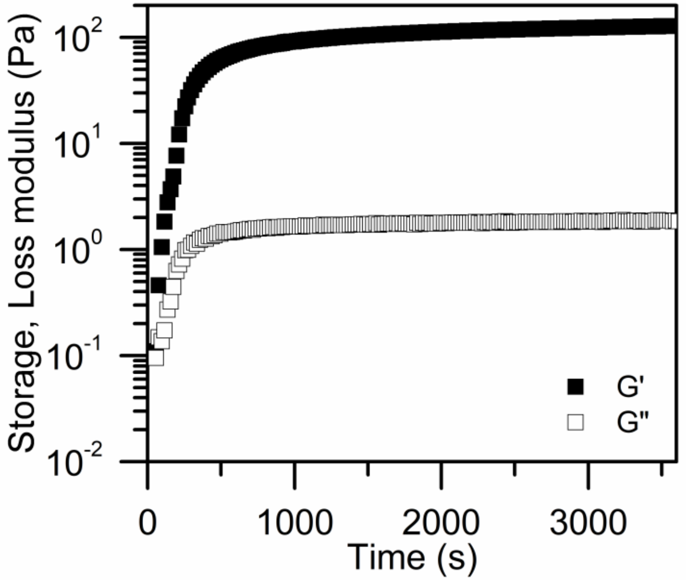


Beta-glycerophosphate
(**βGP**)

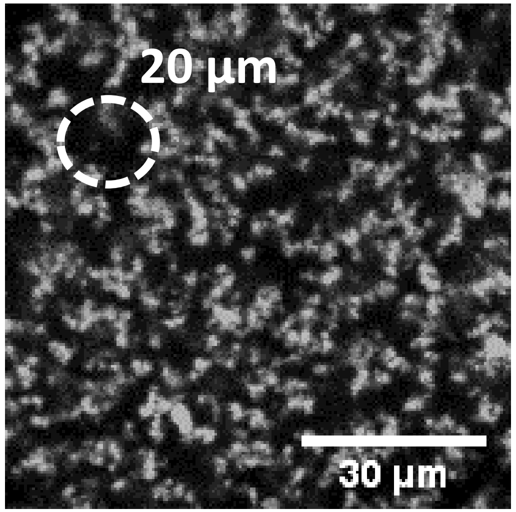


Ammonium hydrogenophosphate
(**AHP**)

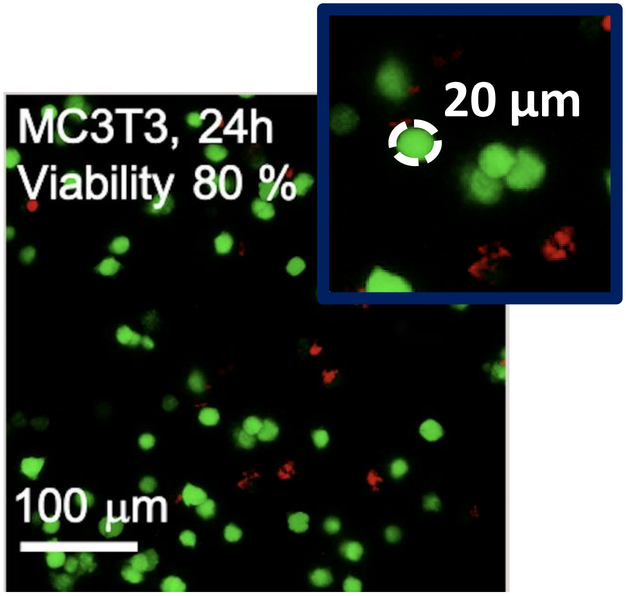
pH = 7.0-7.4 ; 300 mOsm.L^{-1}



Quick gelation



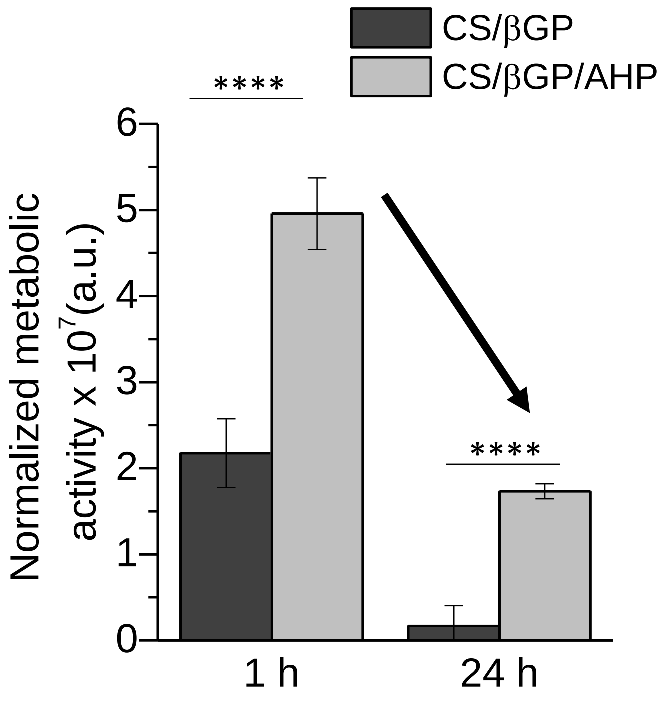
Macroporosity



Cytocompatibility

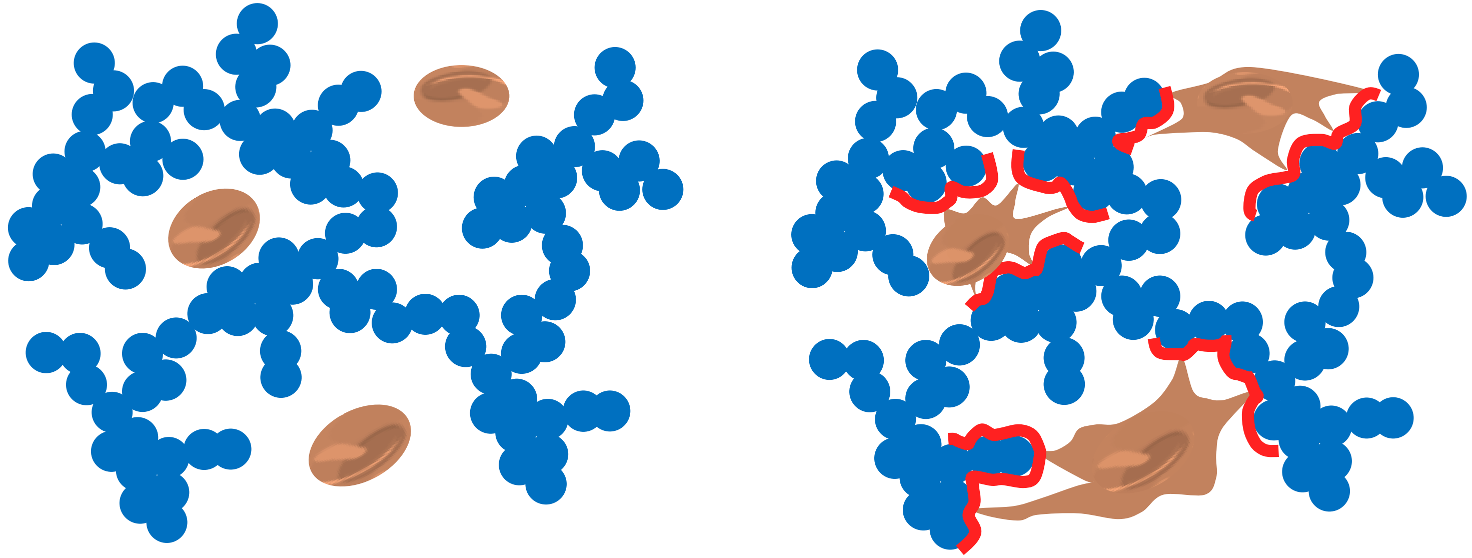
Dang et al., *Carbohydrate Polymers*, 2022

Improving bioactivity in our chitosan/phosphate salts hydrogel



Poor bioactivity
Weak cell adhesion

Hydrogel network

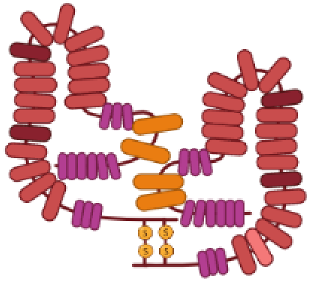


No adhesion

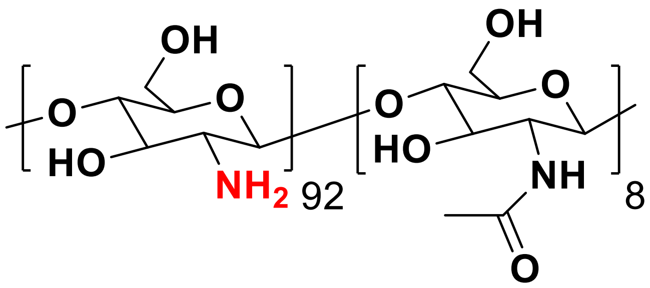
Adhesion

Biofunctionalization of pore surfaces to promote adhesion and confer bioactivity

Incorporation of an adhesion protein: the fibronectin



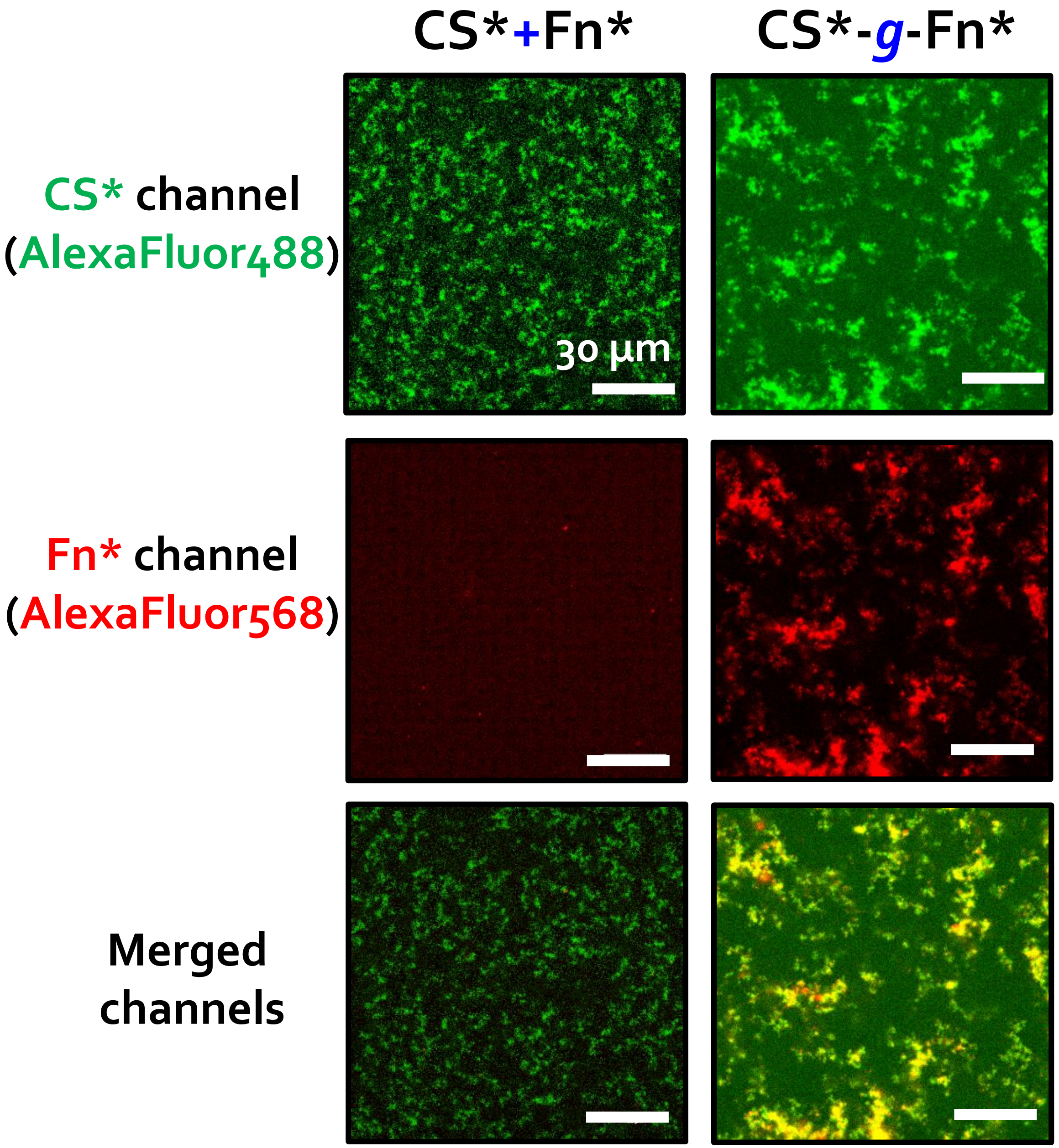
Fibronectin (Fn)
550kDa

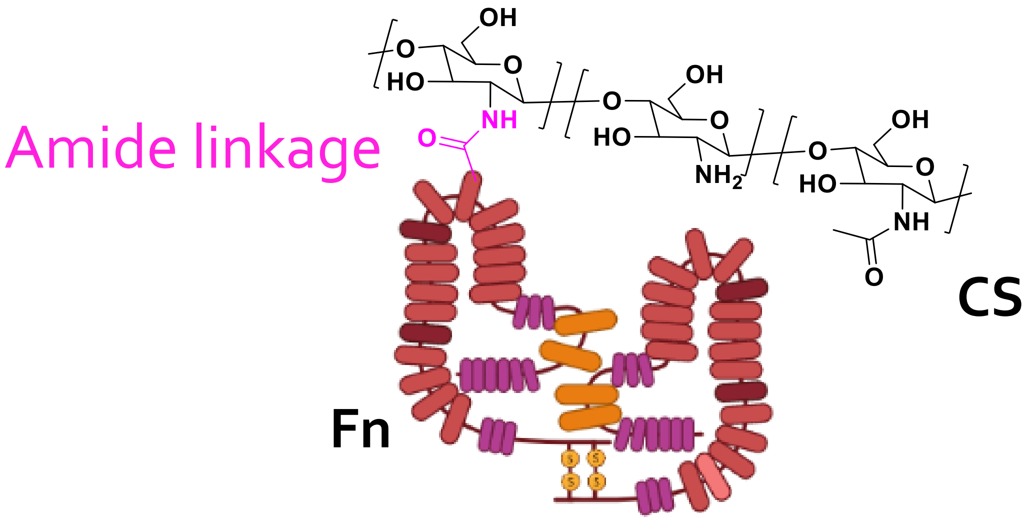


Chitosan (CS)
250kDa

Carbodiimide coupling

Chitosan-grafted-Fibronectin
CS-*g*-Fn





Significant difference in M_w

Effect of fibronectin on …

- Macroporosity?
- Gelation properties?
- Cell metabolism?

➡ Come to poster n°43 !