

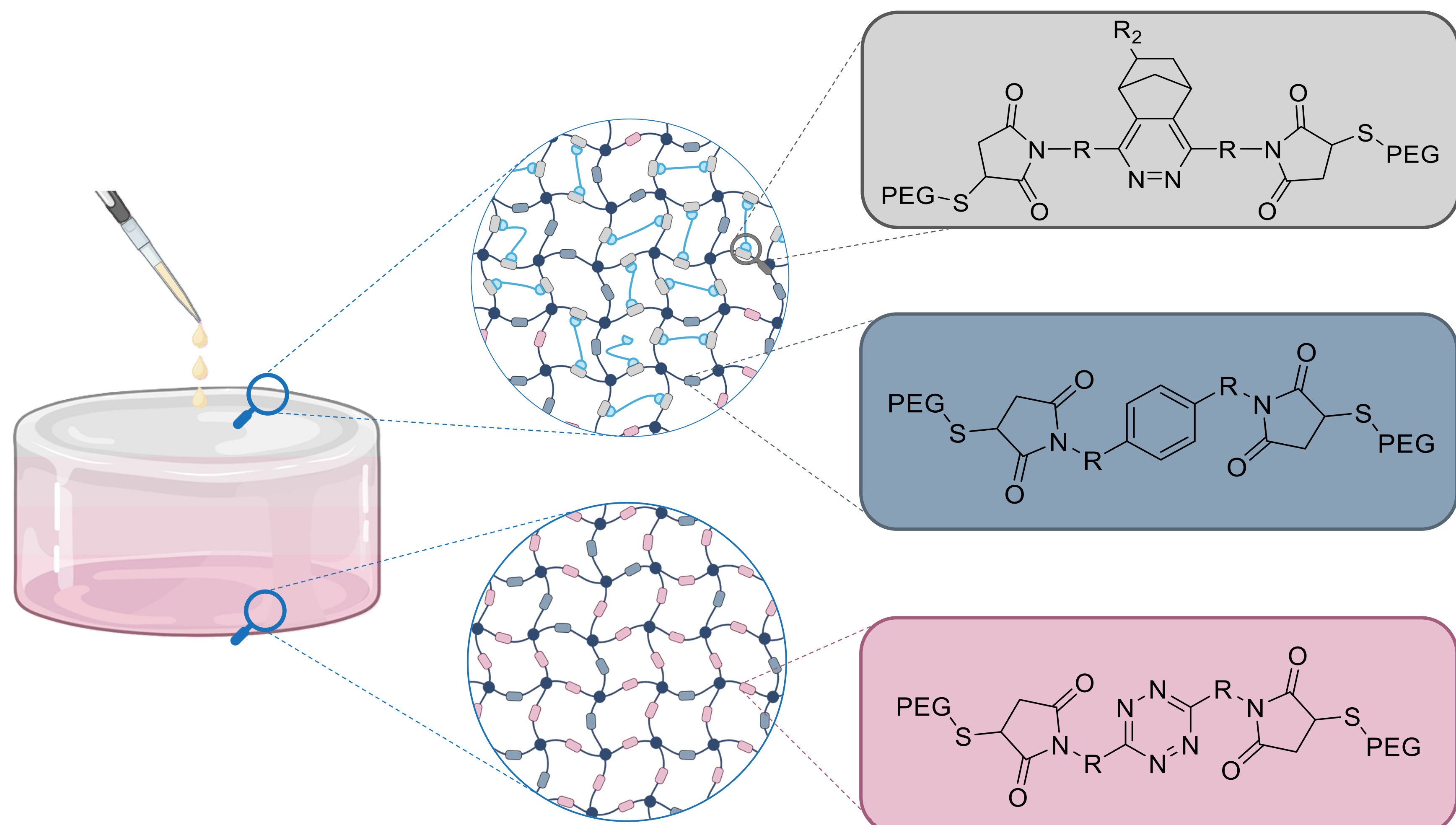
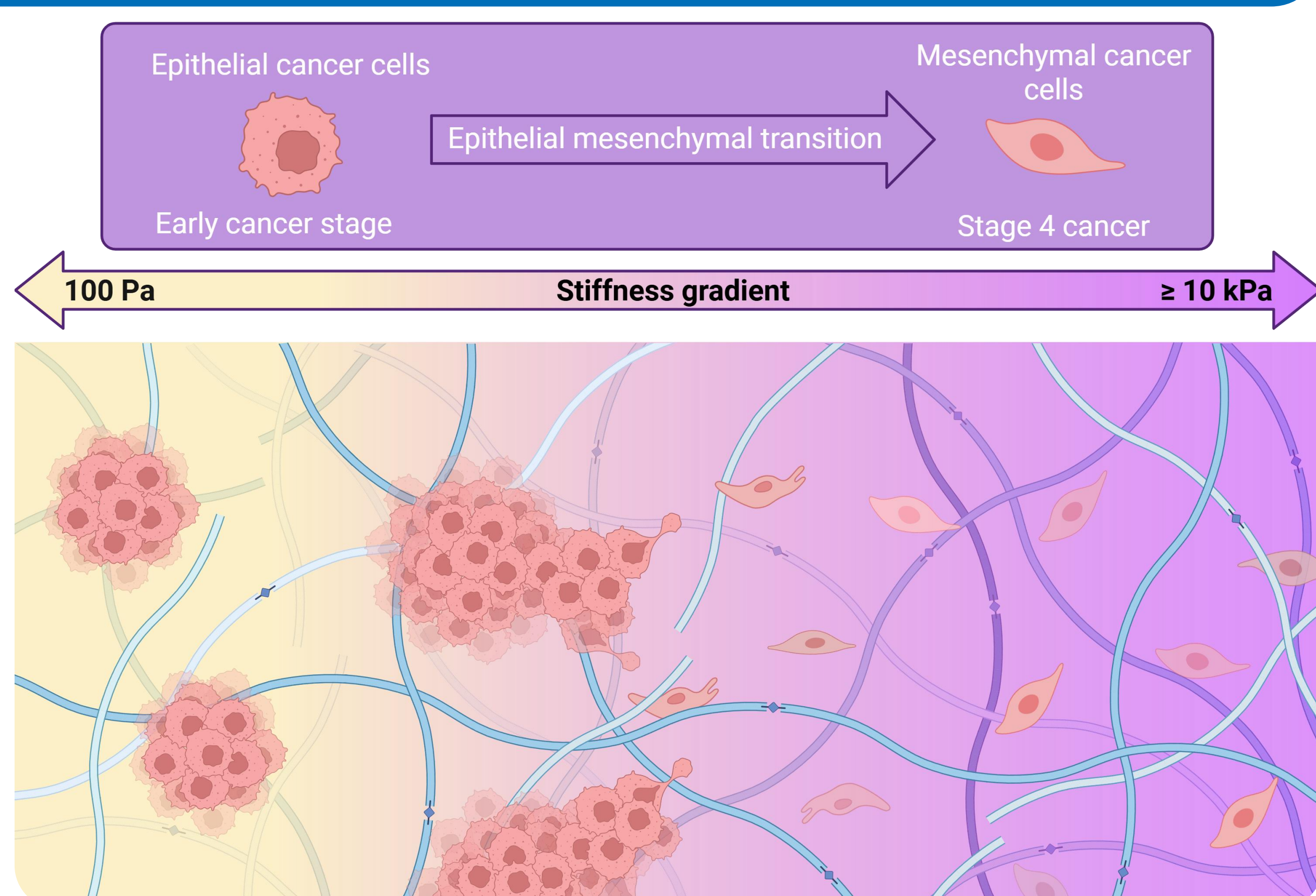
APPLYING DISSOCIATIVE CHEMISTRY TO OBTAIN GRADIENT HYDROGELS

Brent Van Ballaer¹, Ruben Vandijck¹, Noor Polleunis¹, Halima Alem-Marchand², Geert-Jan Graulus¹

¹ UHasselt, Institute of Materials Research (IUMAT), Biomolecule Design Group (BDG), Diepenbeek, Belgium

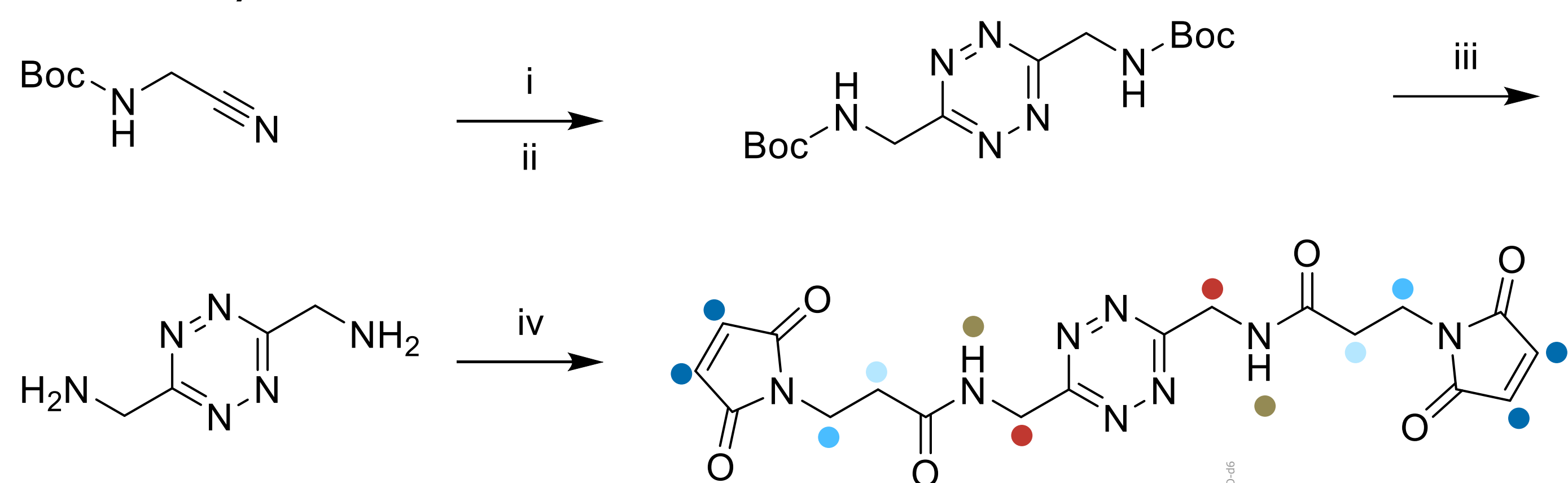
² IJL, CNRS, Université de Lorraine, 54000 Nancy, France

In vitro model of PDAC stiffness gradient

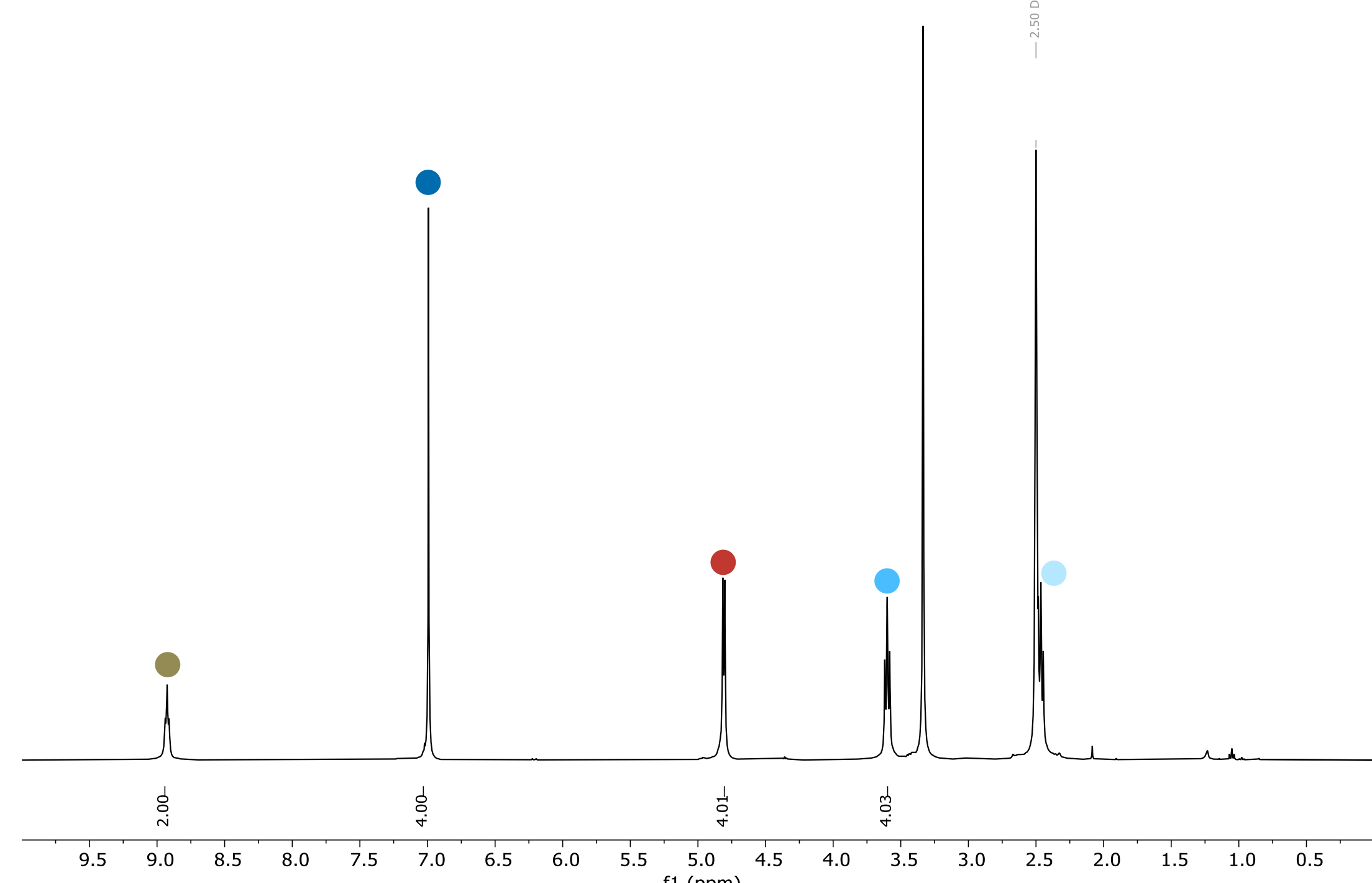


Reactive tetrazine crosslinkers

For this project, the starting reagent requires a protected primary amine on one side and an acetonitrile linked to an ether functionality on the other.

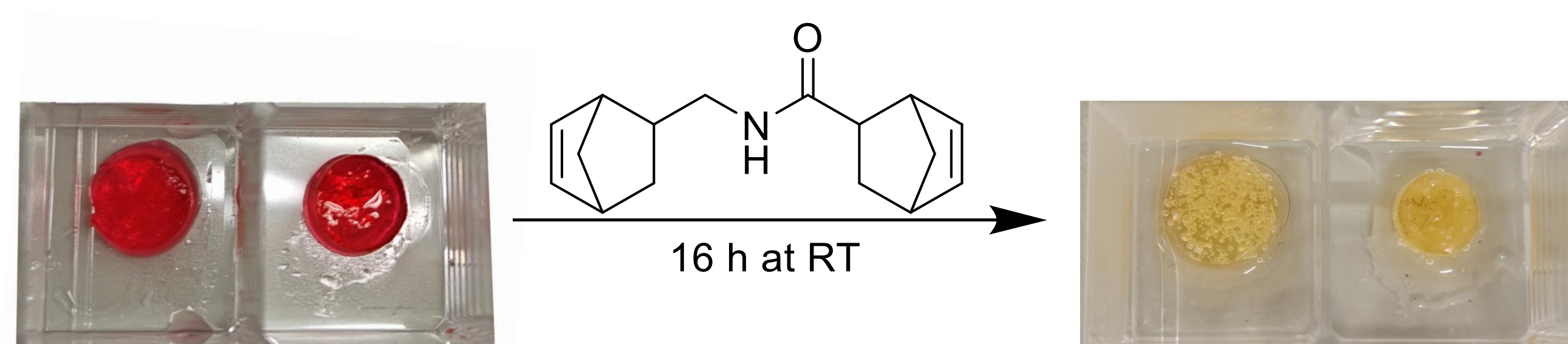


≈ 50%
recovery



i: 3-mercaptopropionic acid and hydrazine hydrate in ethanol, ii: acetic acid and NaNO₂ in H₂O, iii: TFA in DCM, iv: 3-maleimidopropionic acid and EDC in ethanol

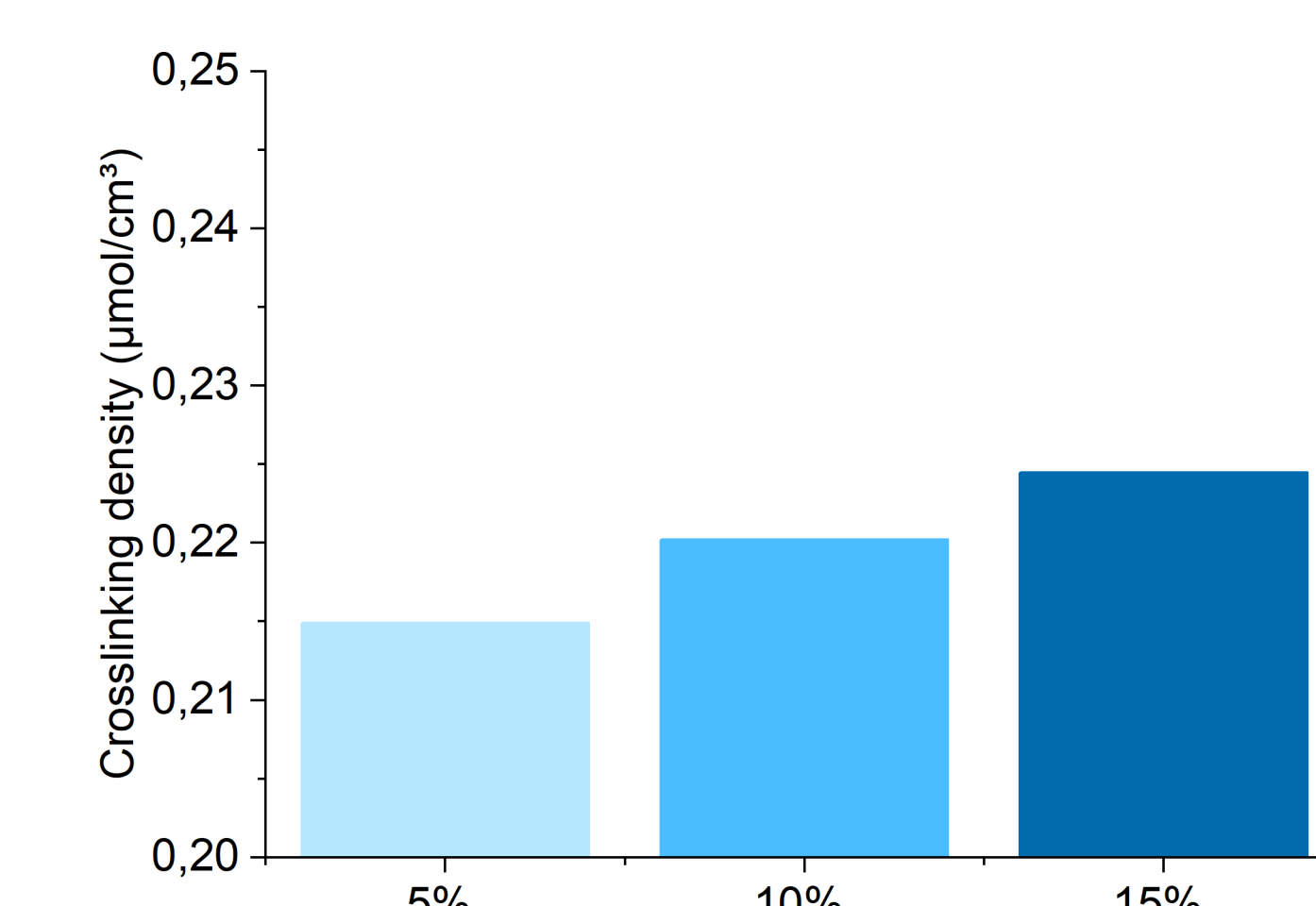
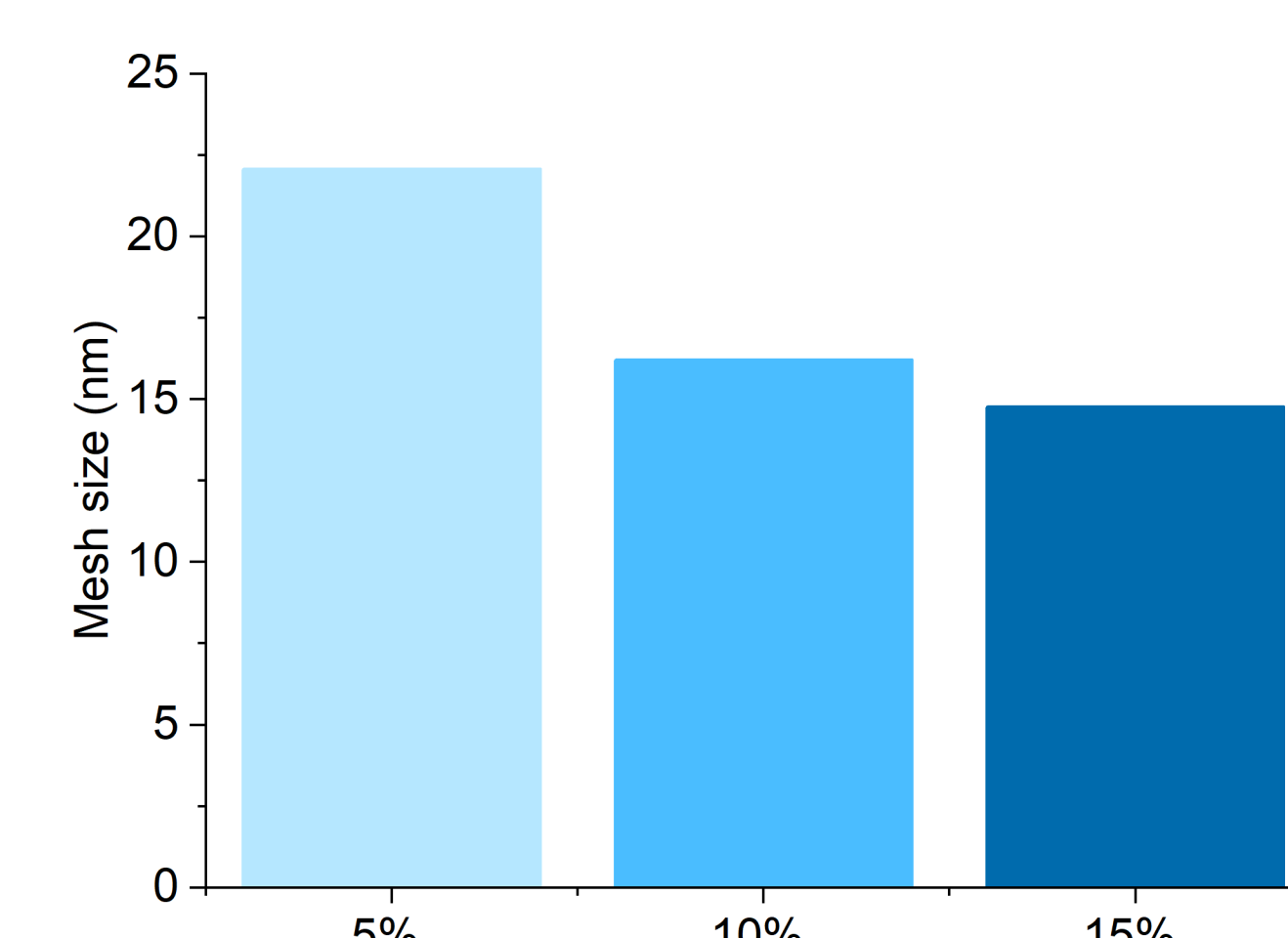
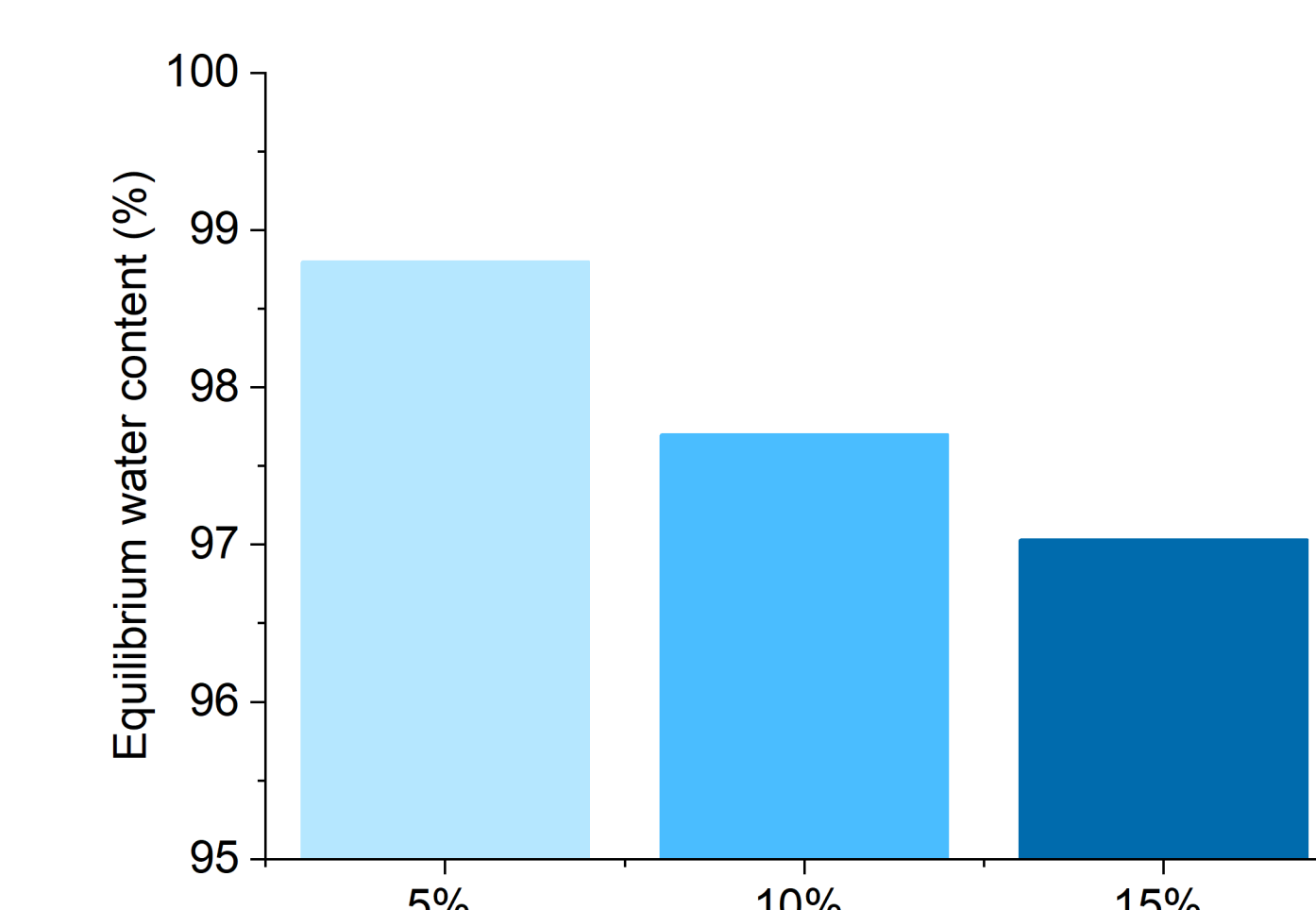
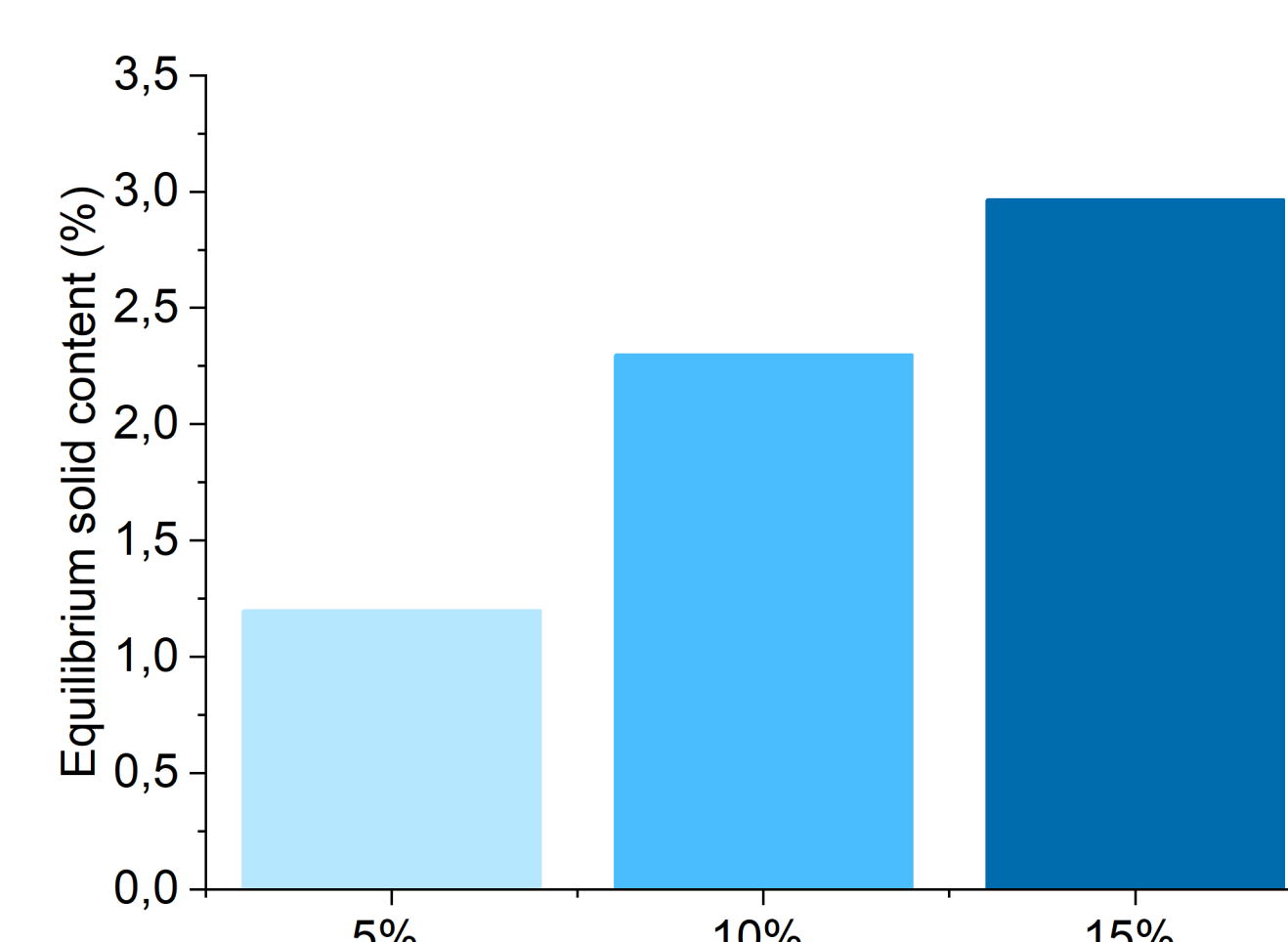
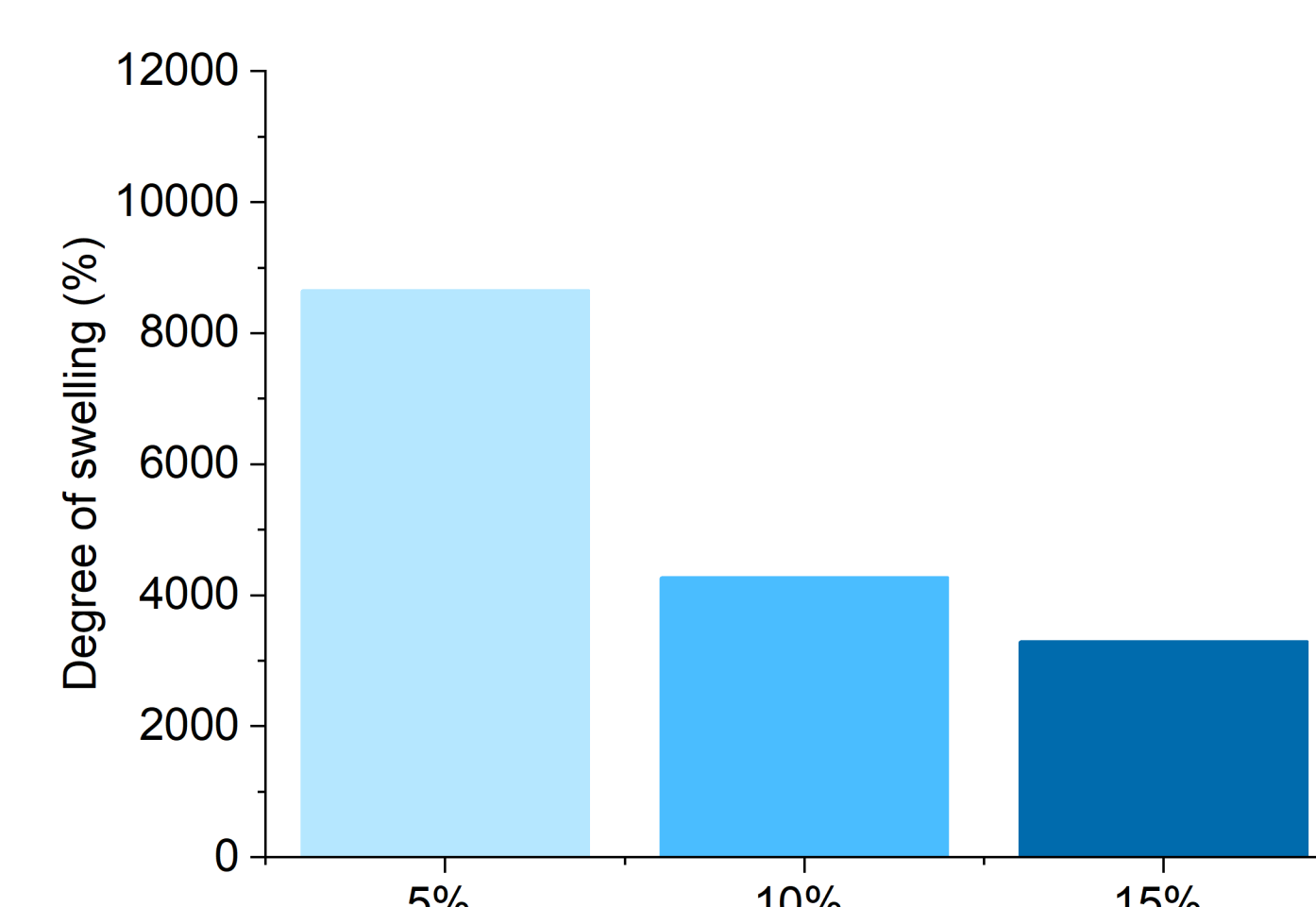
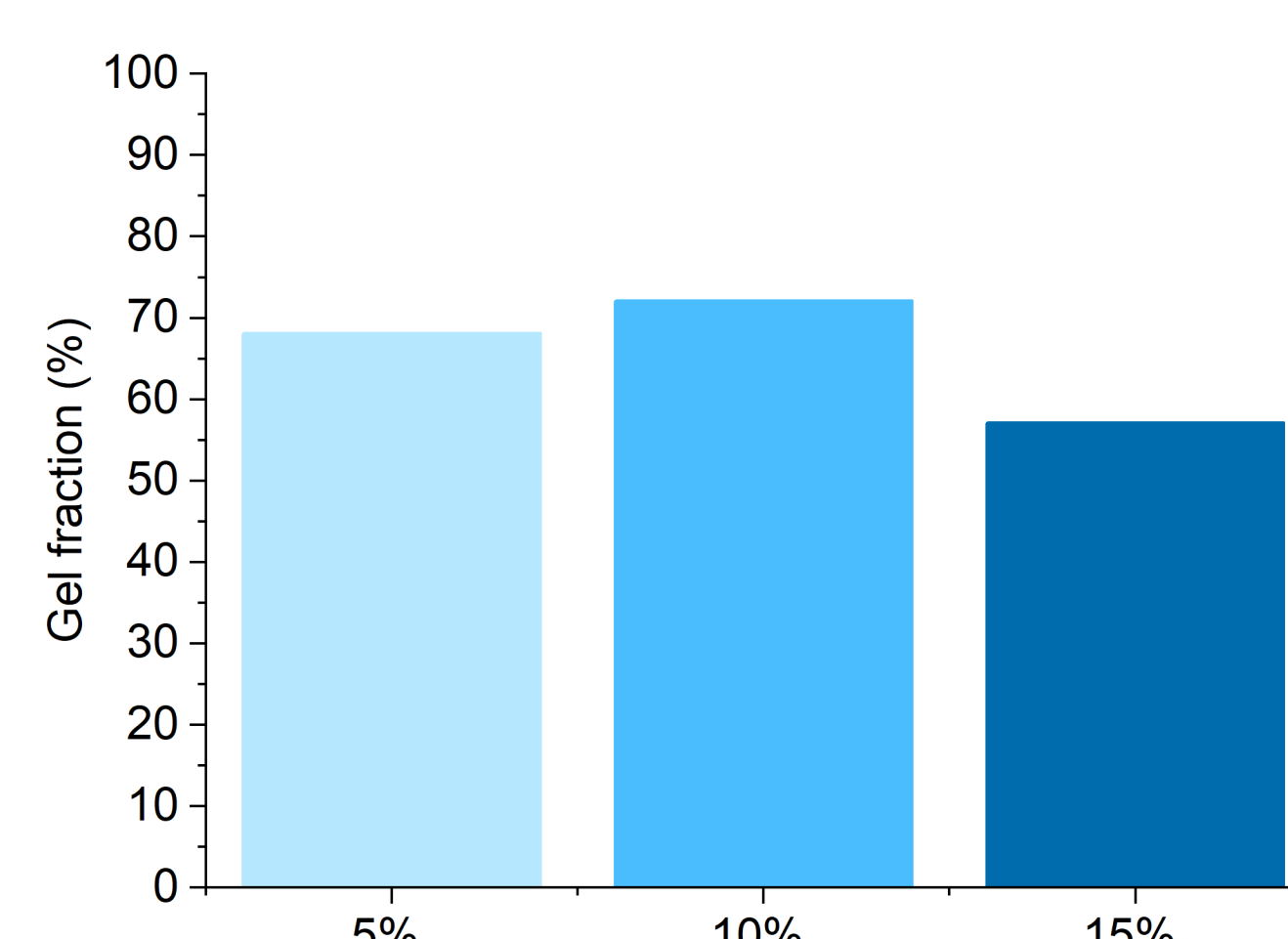
Proof of concept: hydrogel stiffening



Thiol-Maleimide crosslink hydrogels

Three different concentrations (5%, 10%, and 15% (w/v)) of 4-arm 10 kDa PEG-thiol hydrogels were synthesized in three batches, with each batch containing triplicate samples.

Compressive Young's modulus (kPa)	5% (w/v)		10% (w/v)		15% (w/v)	
	non-swollen	swollen	non-swollen	swollen	non-swollen	swollen
	10.61 ± 7.85	2.24 ± 1.06	23.11 ± 5.27	7.01 ± 0.52	46.81 ± 14.43	11.56 ± 4.09



Outlook

- Collaborate with the Vernerey Research Group (CU Boulder) to optimize the data-driven simulations and predict the hydrogel's formulation
- Fabricate and characterize anisotropic hydrogels
- Test the optimized hydrogels *in vitro* using 3D PDAC tumor models in collaboration with the Nanomaterial and Health group (ULorraine)

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Contact

Brent Van Ballaer:
(brent.vanballaer@uhasselt.be)

Biomolecule Design Group
(BDG)

