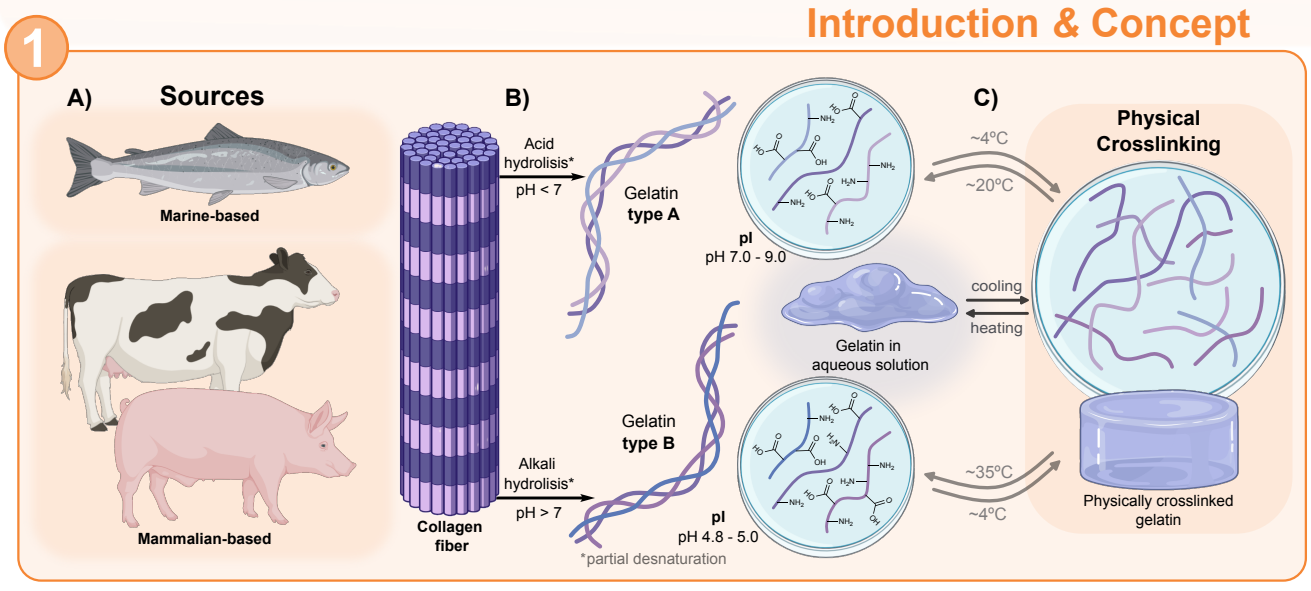
cbecimat26
26º Congresso Brasileiro de Engenharia e Ciência dos Materiais
22 a 26 de novembro de 2026
Costão do Santinho
Florianópolis-SC

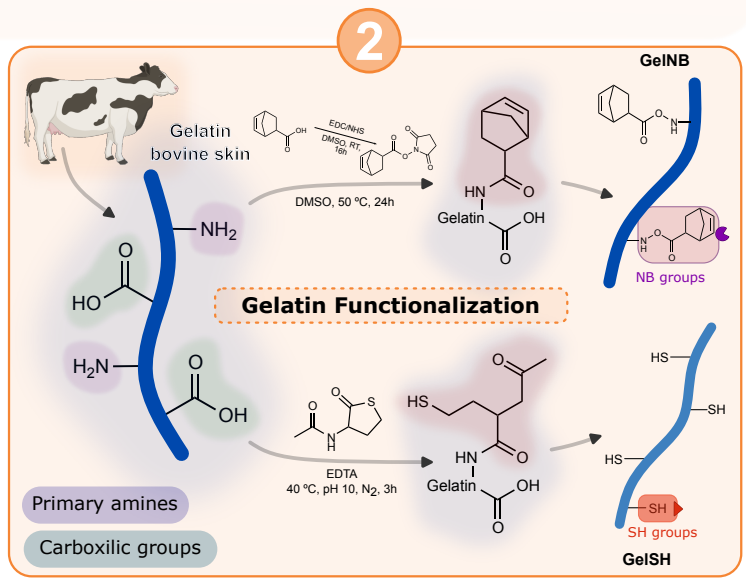
Photocrosslinking of Gelatin-Norbornene with Thiolated Poly(vinylpyrrolidone) for Advanced 3D Printing and Biomedical Applications

Iago Aguiar Dias Carmo[1,2], Sandra Van Vlierberghe[2], and Roniérik Pioli Vieira[1]

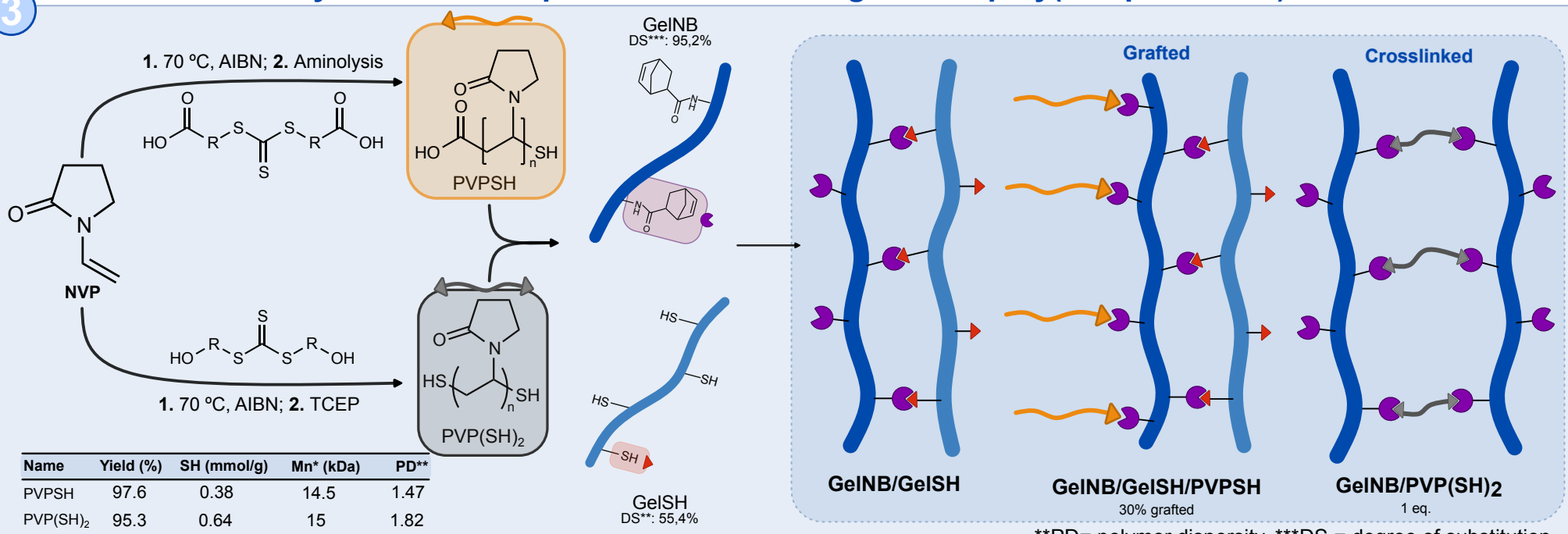
[1]*Universidade Estadual de Campinas (UNICAMP), School of Chemical Engineering (FEQ), Brazil*
[2]*Polymer Chemistry and Biomaterials Group (PBM), Ghent University (UGent), Belgium*

Introduction & Concept





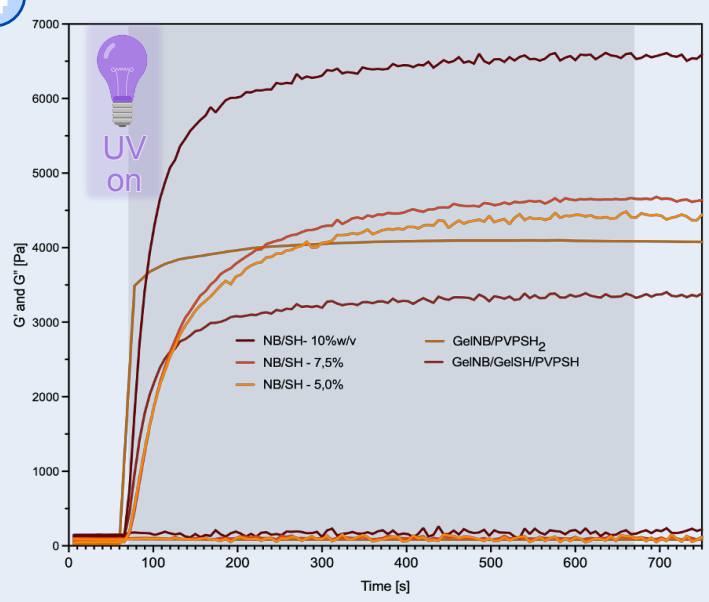
Synthesis of the photo-crosslinkable/graftable poly(vinilpirrilidone)



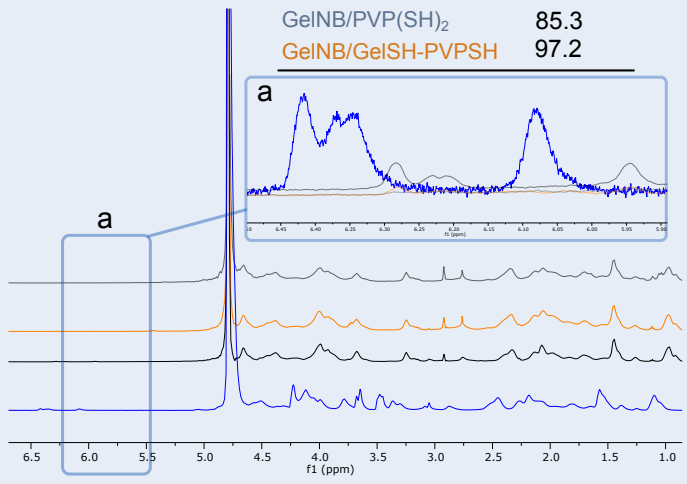
Name	Yield (%)	SH (mmol/g)	Mn* (kDa)	PD**
PVPSH	97.6	0.38	14.5	1.47
$PVP(SH)_2$	95.3	0.64	15	1.82

**PD= polymer dispersity, ***DS = degree of substitution

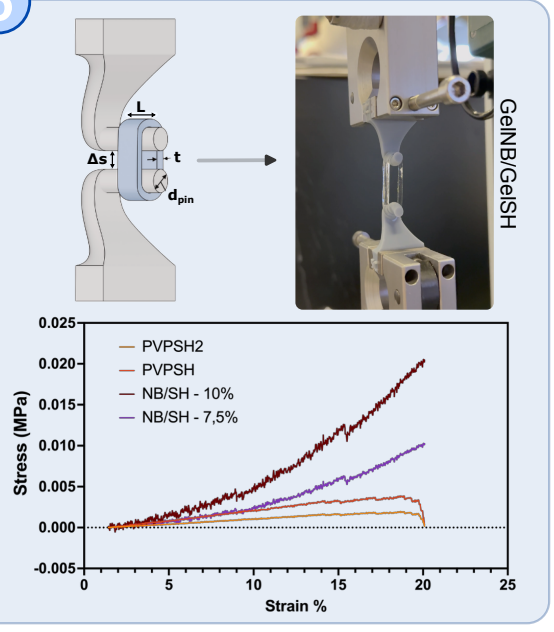
In Situ Photorheology and HRMAS NMR Analysis



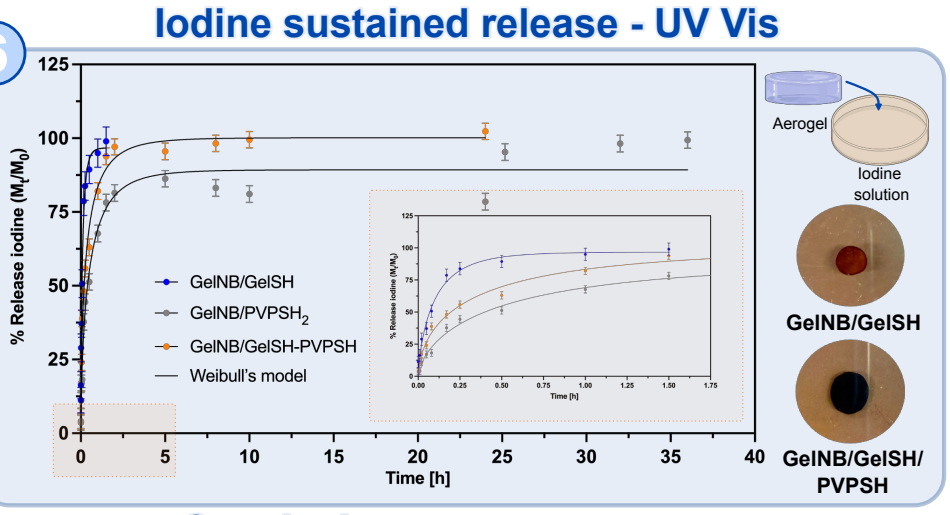
Name	Conversion (%)
GelNB	-
GelNB/GelSH	95.2
$GelNB/PVP(SH)_2$	85.3
GelNB/GelSH-PVPSH	97.2



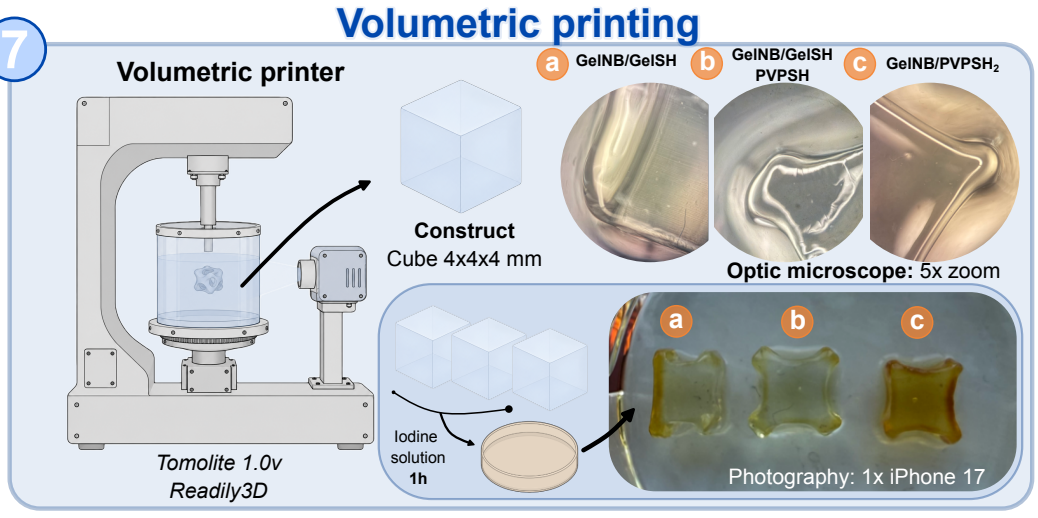
Mechanical strength



Iodine sustained release - UV Vis



Volumetric printing



Conclusions

Overall, the integration of protein-derived matrices with synthetic hydrophilic polymers via thiol–ene chemistry enables the formation of well-defined hydrogel networks with tunable architecture and enhanced loading capacity for antiseptic agents. This strategy leverages the robustness of step-growth crosslinking to mitigate interference from bioactive compounds, resulting in structurally stable and functionally efficient systems. These findings position hybrid gelatin–PVP hydrogels as promising platforms for advanced antiseptic delivery applications.

*Supplementary Information

Acknowledgments

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