

#### Resource recovery from aerobic granular sludges

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Laboratoire de Biotechnologies Agroalimentaire et Environnementale



# **Resource recovery from aerobic granular sludges: Gel-forming** biopolymers extraction, fractionation and gelling capacity

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- Extracellular polymeric substances (EPS) extracted from aerobic granular sludge have the capacity to form hydrogels in the presence of divalent cations like calcium (Bou-sarkis et al., 2022).
- The characteristics of the obtained hydrogels are influenced by their molecular properties:
- In the case of alginates from seaweed, a higher molecular weight was shown to give the compound a better gel formation kinetics and enhanced viscosities (Farrés & Norton, 2014).



### Context





- the charge of molecules influences their gelling capacity (Beaumont et al., 2021).
- Lack of knowledge concerning the effects of molecular weight and net surface charge on EPS gelation.



**EPS Valorization as hydrogel** forming polymers Pagliaccia et al., 2022

Does the **charge** and **molecular weight** of the extracted EPS affect their capacity to form hydrogels?



# **Detection of gelation through a miniaturized screening method**

- Extracted EPS at a final concentration of 1 % (w/v) VS were incubated for 1h with 0.1 M calcium chloride (using only 2 mg of the sample to be tested).
- Centrifugation at 14 0000g for 15 min.
- The volume of the supernatant was measured and therefore the gel volume (Vg) giving a gel volume percentage (%Vg).
- UV-vis spectra between 220 and 500 nm were measured to determine a reactivity (%R) corresponding to the percentage of area that disappeared from the spectra after addition of calcium.
- The gelling factor (GF) equation is: GF = % Vg \* %R

Bou-sarkis et al., 2022

information: reactivity

Quantitative



agents.