

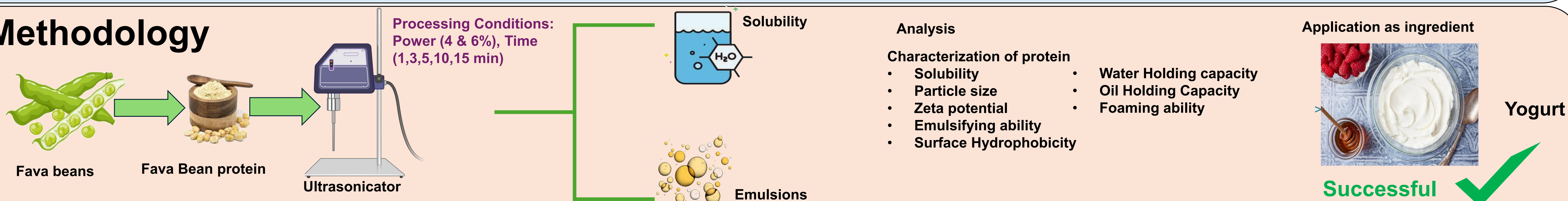


Structure - Function Interplay of Fava Bean Protein via Mild Ultrasonication

Background and Aim

- Fava bean protein is a **sustainable alternative** to animal proteins.
- Its application is limited by **poor solubility** ^[1] and **digestibility** ^[2]
- Mild ultrasonication** can **improve** the functionality of **fava bean protein** as compared to **pea, soy** and **rice** due to distinct native structures.
- Understanding **structure-function relationships** is essential for **ingredient design**.

Methodology



Results

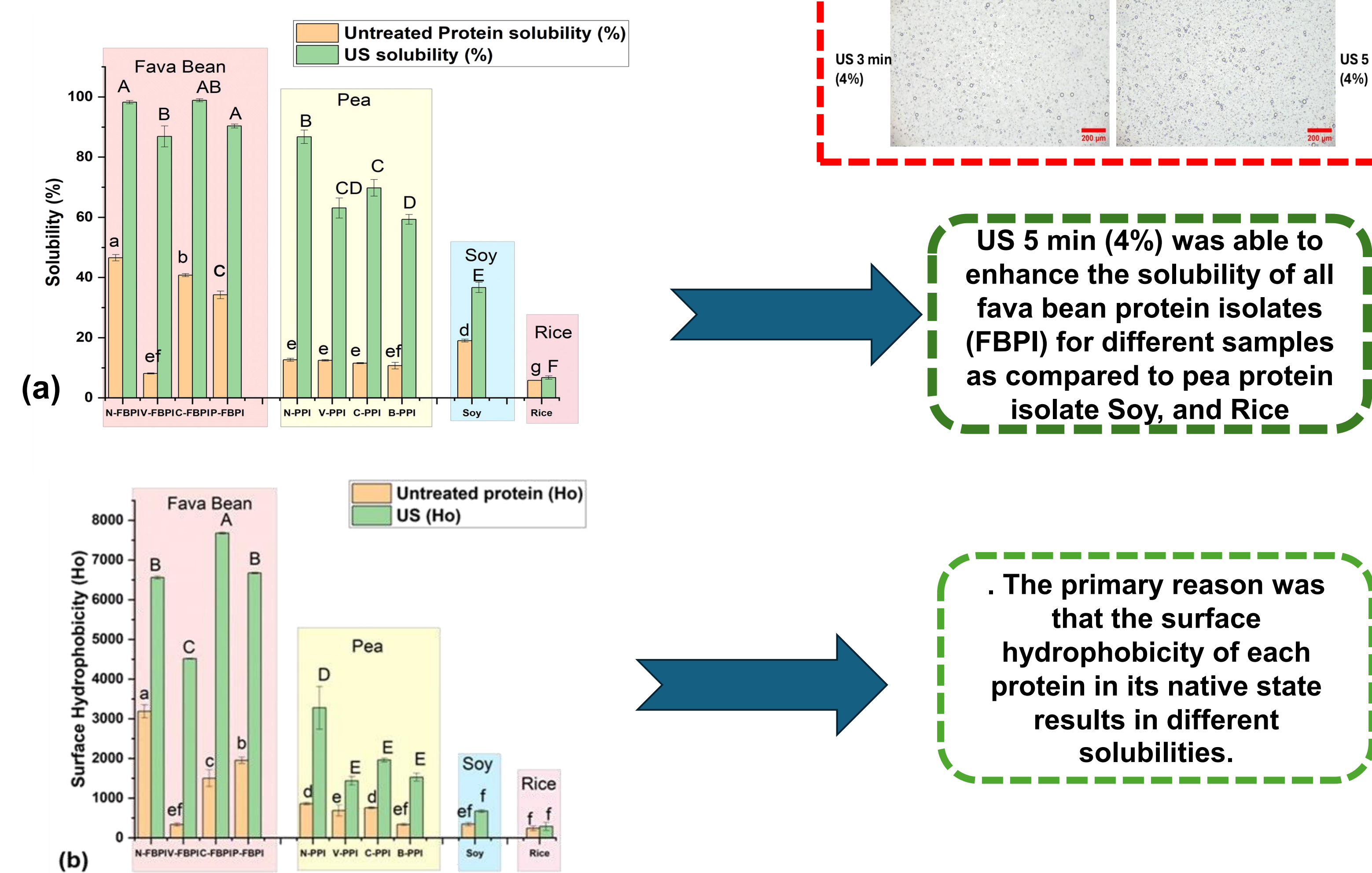
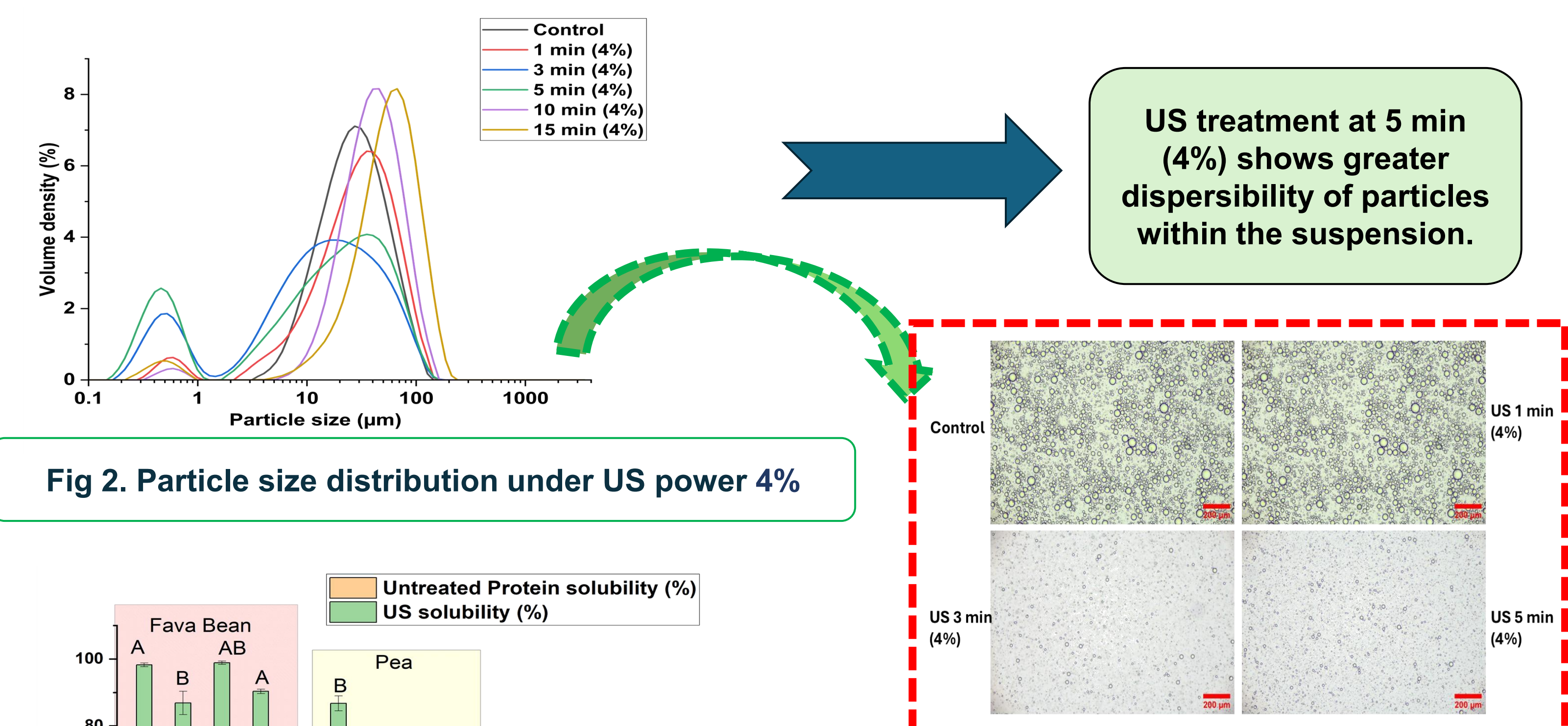
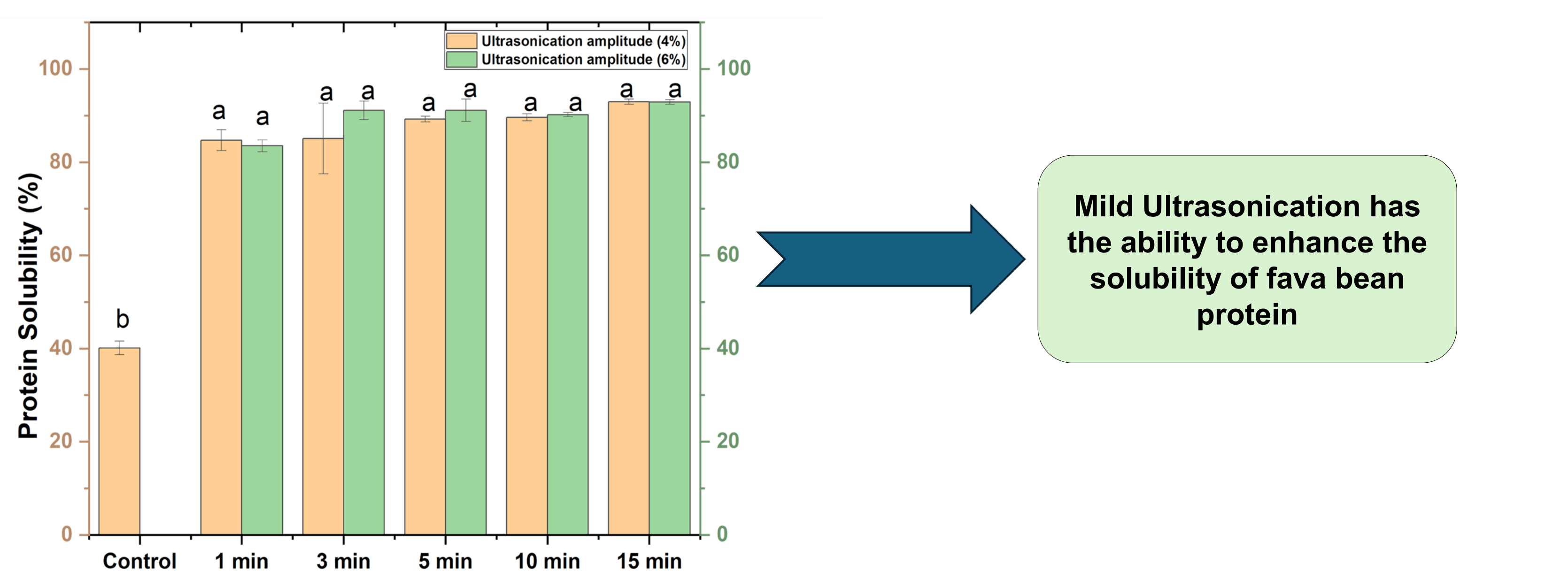


Fig 3. (a) Solubility profile of different protein isolates, (b) Surface Hydrophobicity of different isolates

Application of fava bean proteins in yogurt analogue

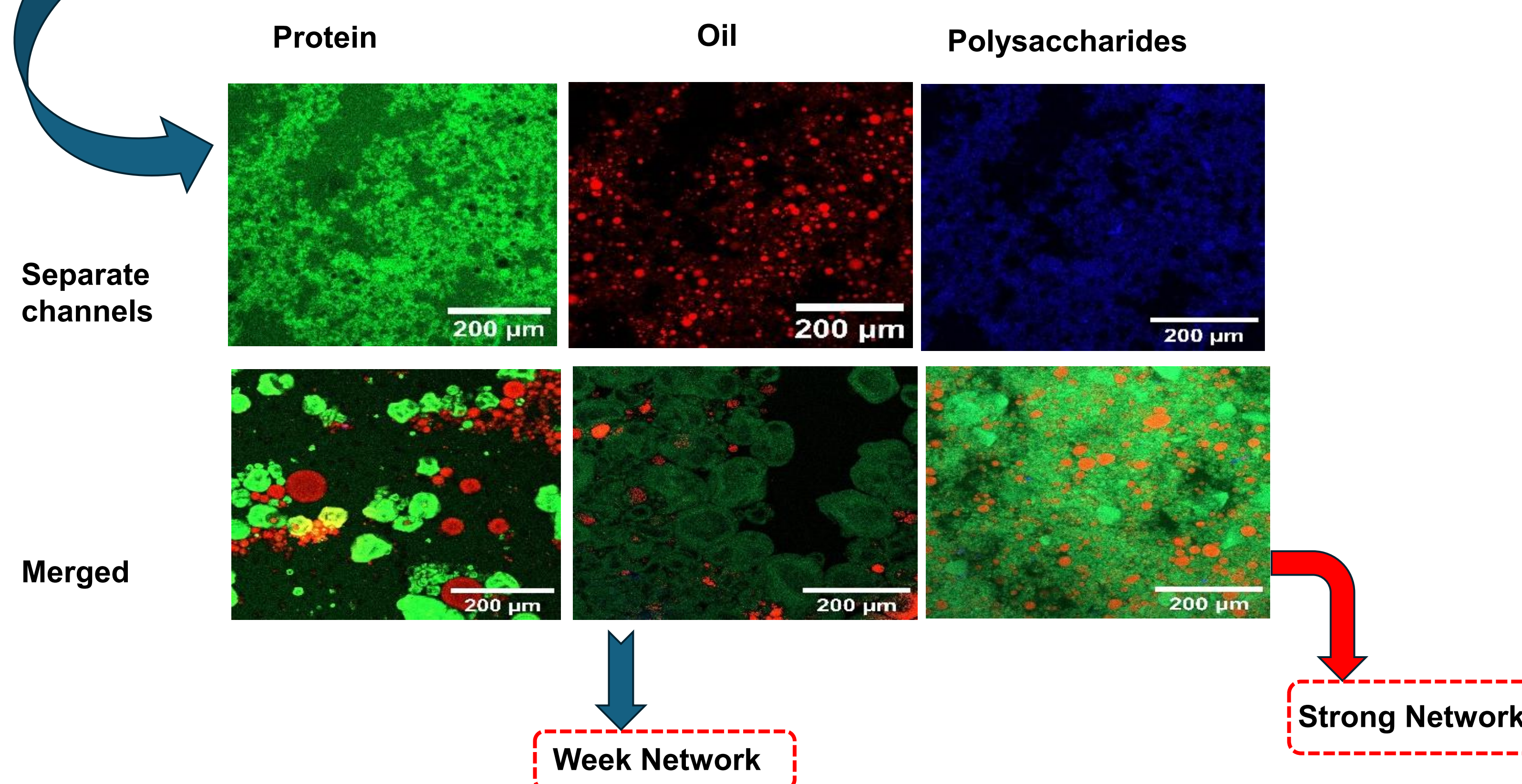
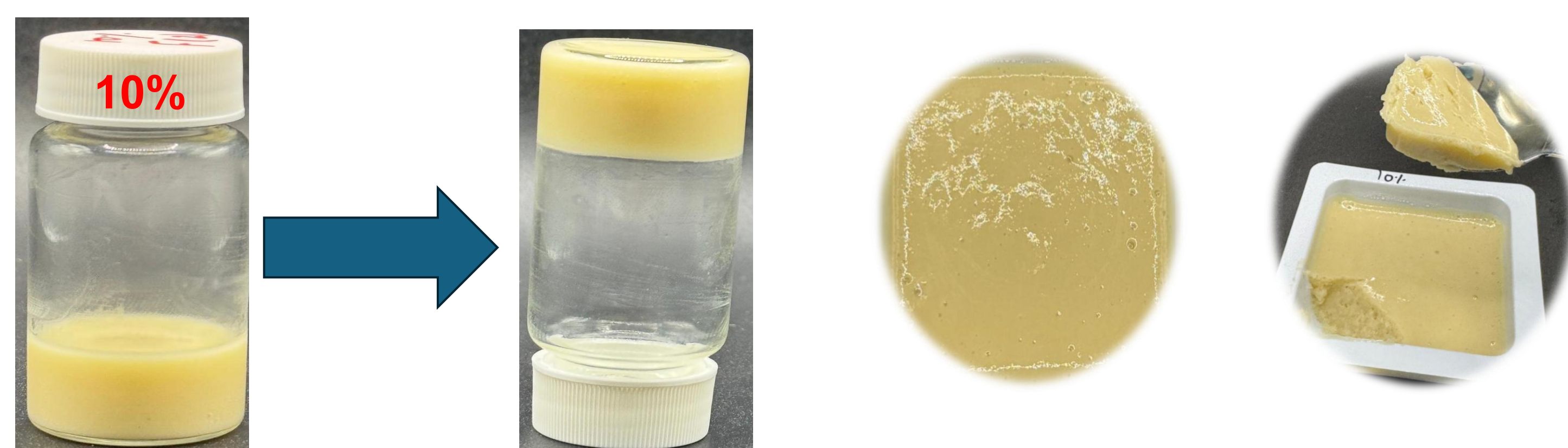


Fig 5. Gel's internal structure (Fava bean 4%) observed by confocal laser scanning microscopy

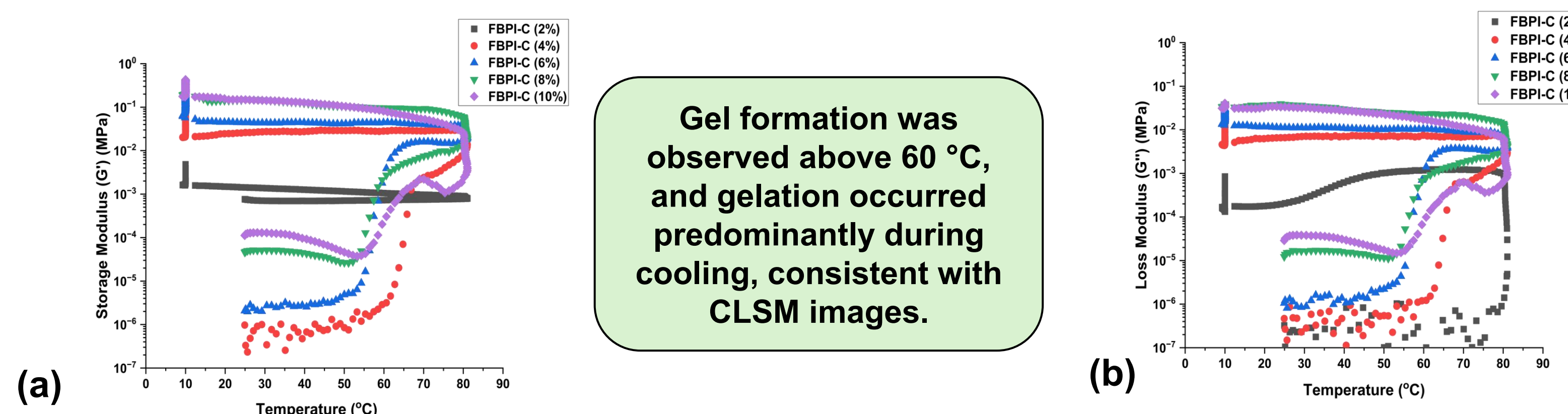


Fig 6. Rheological analysis impact of temperature on (a) Storage modulus (b) loss modulus fava protein control (FBPI-C 2-10%)

Conclusion & future recommendation

- Fava bean protein functionality can be enhanced under low-intensity US conditions due to its distinct functional and structural properties.
- Ultrasonication is a promising technique for protein functionality enhancement if parameters are selected based on the native protein structural characteristics.
- Fava bean protein in combination with other polysaccharides can mimic the texture of yogurt without fermentation.
- Future work will focus on probiotics and micronutrient delivery with different encapsulation techniques.

References

- Mukhtar, K., Wang, Y., & Selomulya, C. (2026). Improving fava bean protein functionality via mild ultrasonication: A comparative study with other plant proteins. *Food Research International*, 236, 119231. <https://doi.org/10.1016/j.foodres.2026.119231>
- Mukhtar, K., Ying, J., Wang, Y., & Selomulya, C. (2026). Unlocking the Functional Properties of Plant Proteins in Designing Food Formulations for Senior Adults. *Comprehensive Reviews in Food Science and Food Safety*, 25(3), e70461. <https://doi.org/10.1111/1541-4337.70461>; JOURNAL: JOURNAL:15414337; WGROUP: STRING: PUBLICATION

Organizers

