

1 RESEARCH MOTIVATION & FOCUS

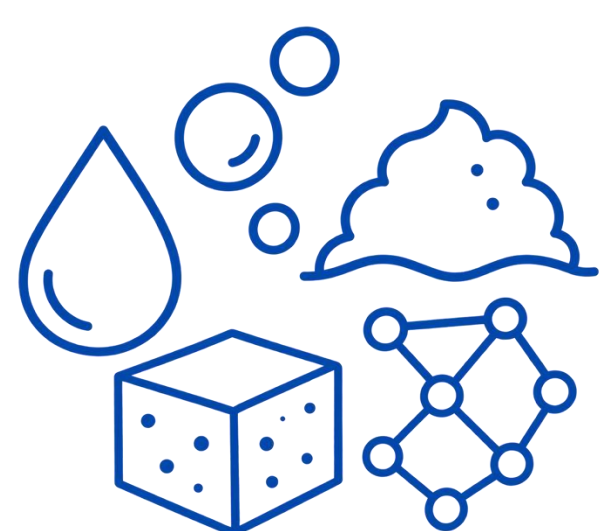
Plant proteins offer a more sustainable protein source, but their **functionality** and performance in real food systems remain key challenges.

Unlocking the potential of plant proteins by linking processing-induced structural changes with protein functionality and interfacial behaviour for developing sustainable, high-quality foods.



SUSTAINABILITY

Sustainable protein ingredients for a better planet



FUNCTIONALITY

Protein functionality across food applications



FOOD QUALITY

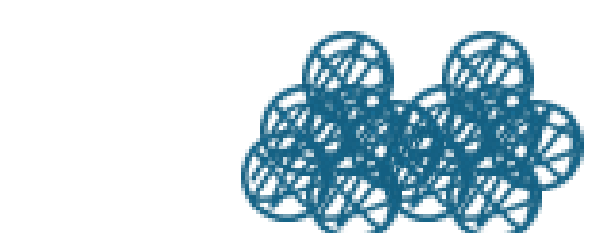
Enhanced stability, nutrition & sensory experience

— From fundamental understanding to application-driven food design —

2 RESEARCH HIGHLIGHTS

A. Tailoring plant protein structure

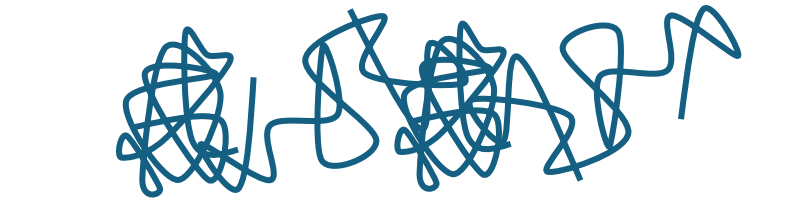
Native structure: compact



Controlled thermal treatment

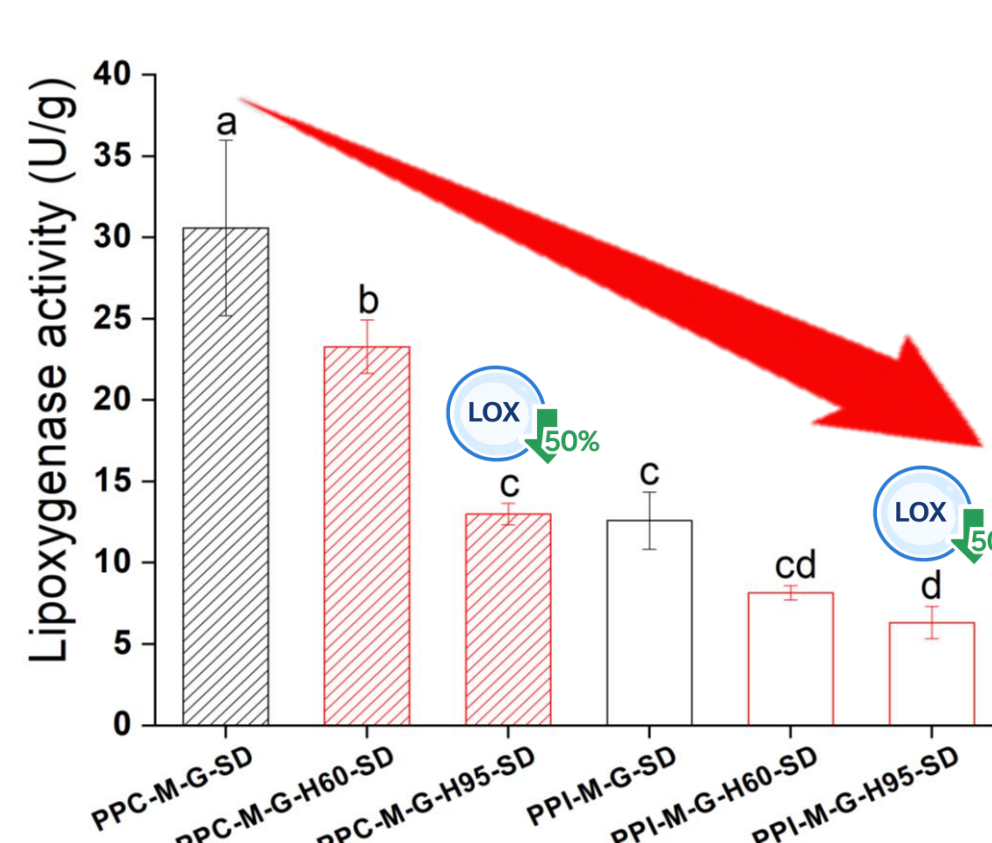
Pea protein Restructuring

Unfolding + Flexible



- Solubility ↑
- Emulsification ↑
- The affinity of proteins for beany compounds ↓

Lipoxygenase activity ↓

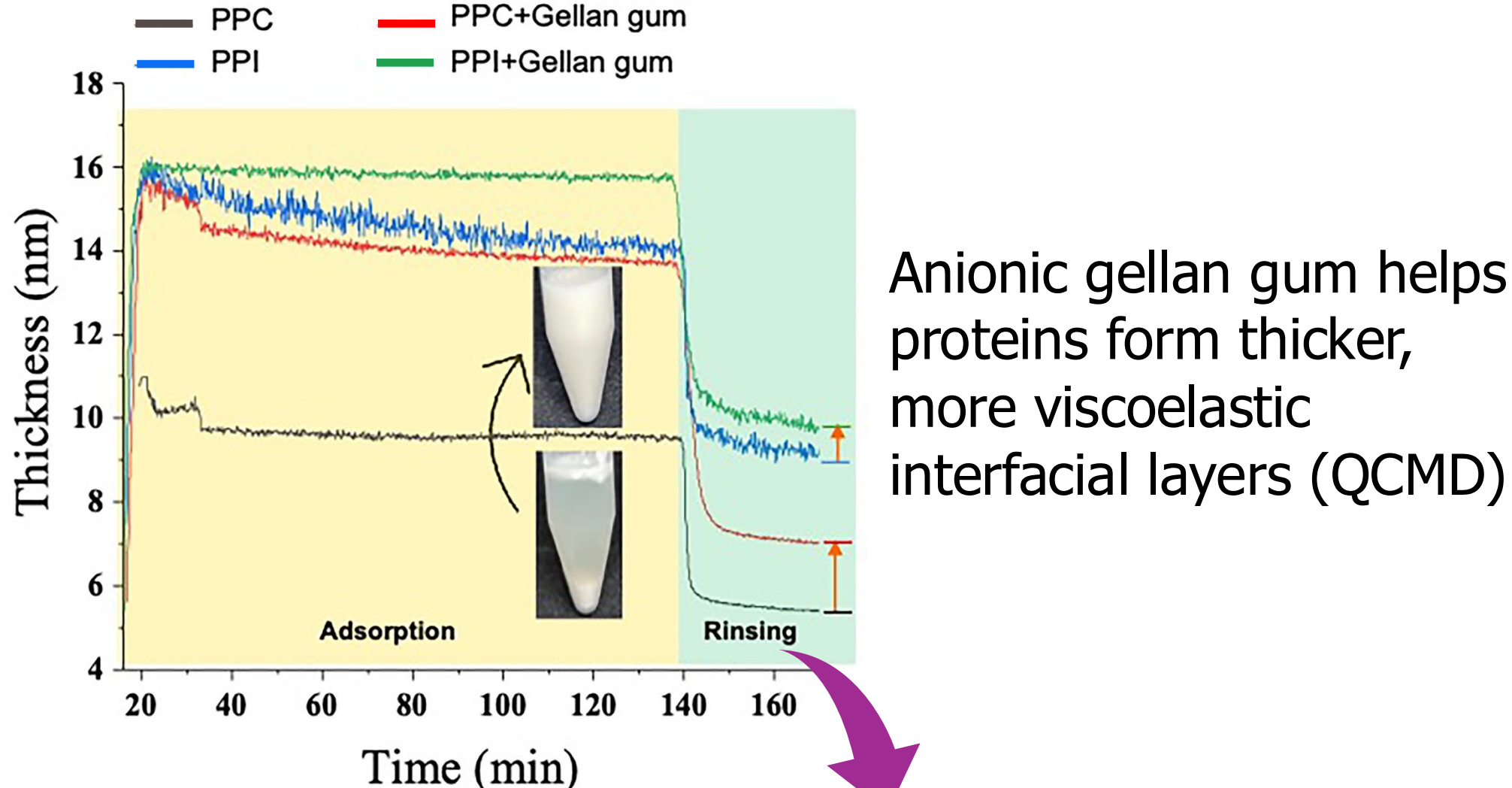


Processing strategies modulate protein structure, improving solubility and emulsifying properties, while reducing oxidation and beany off-flavour.

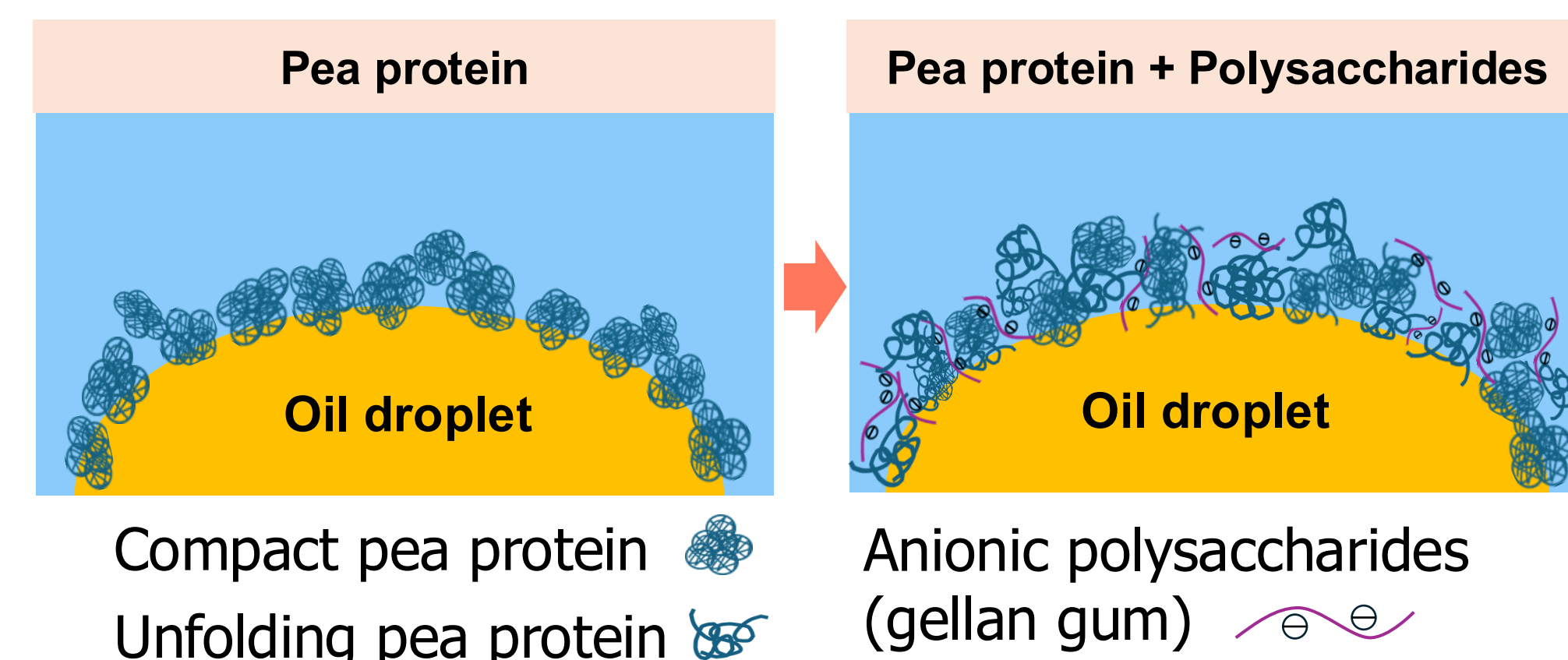
Ref: Lao et al. Food Research International 172 (2023) 113180; Lao et al. Food Chemistry 493 (2025) 145902

B. Understanding oil-water interfacial behaviours

Quartz crystal microbalance with dissipation (QCM-D)



Schematic of the oil-water interface

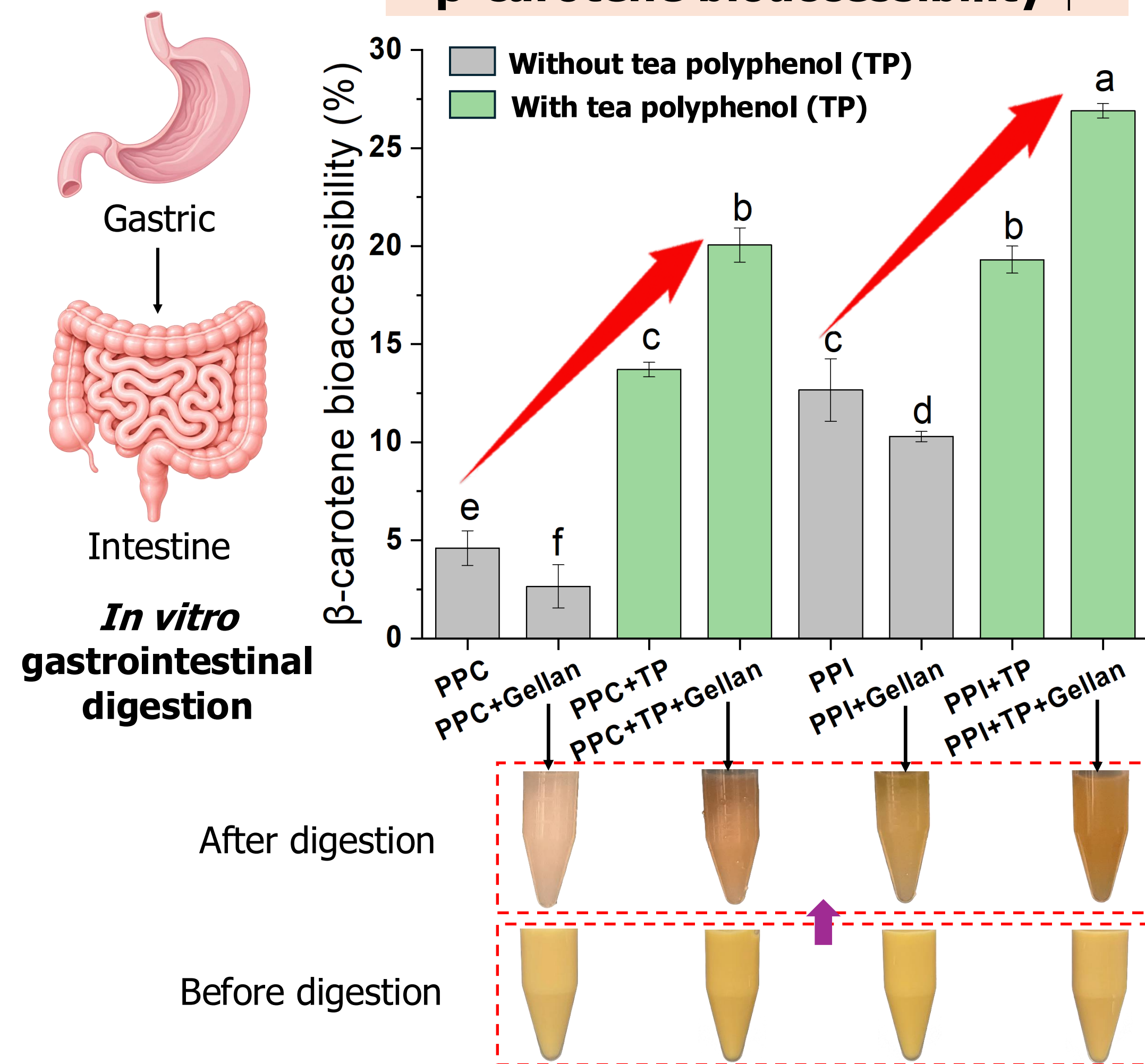


Polysaccharides strengthen the interfacial layer and improve the physical stability of the emulsion.

Ref: Lao et al. International Journal of Biological Macromolecules 282 (2024) 136749

C. Enhancing the stability and delivery of bioactive compounds

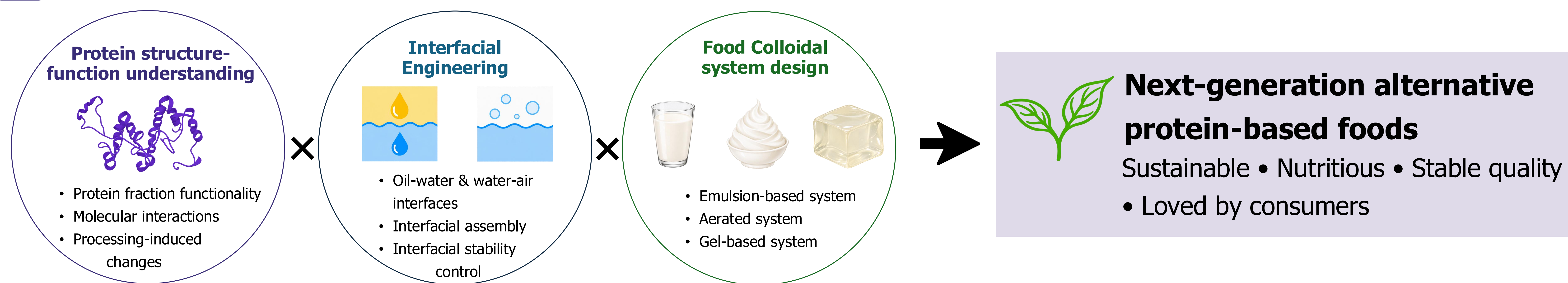
β-carotene bioaccessibility ↑



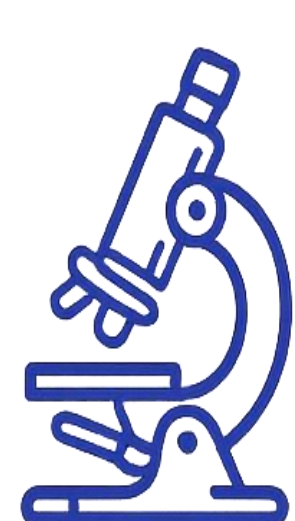
Polyphenols enhanced β-carotene protection and delivery, while gellan gum provided the physical stability required for the emulsion system.

Ref: Lao et al. Unpublished data

3 FUTURE RESEARCH VISION

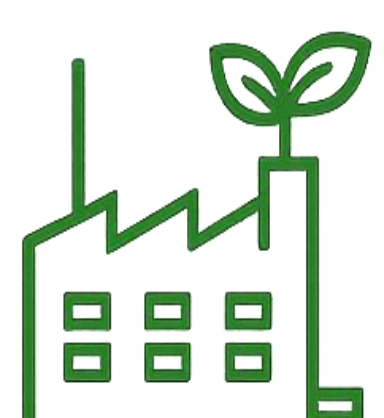


4 CONNECT & COLLABORATE



RESEARCH

Driving innovation in food science through **interfacial engineering** and **protein structure-function** understanding



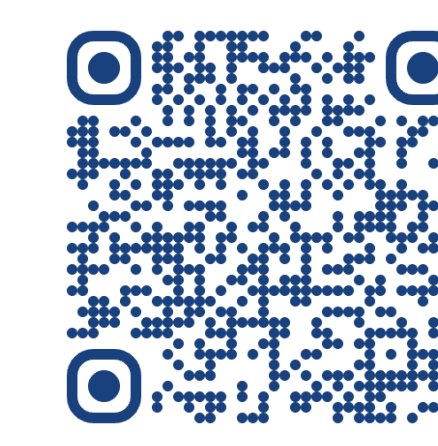
INDUSTRY

Sustainable food product innovation
Food processing technology **translation**



NETWORKING

Open to ideas, partnerships, and opportunities for creating more **impact**



Connect on LinkedIn

Organizers

