Can transglutaminase improve meat analogue structures?

Extensive rheological analysis of transglutaminase treatment on pea protein and mung bean protein

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1 INTRODUCTION

Alternatives to soy protein isolate for the production of meat analogues:

Pea protein isolate

Mung bean protein isolate

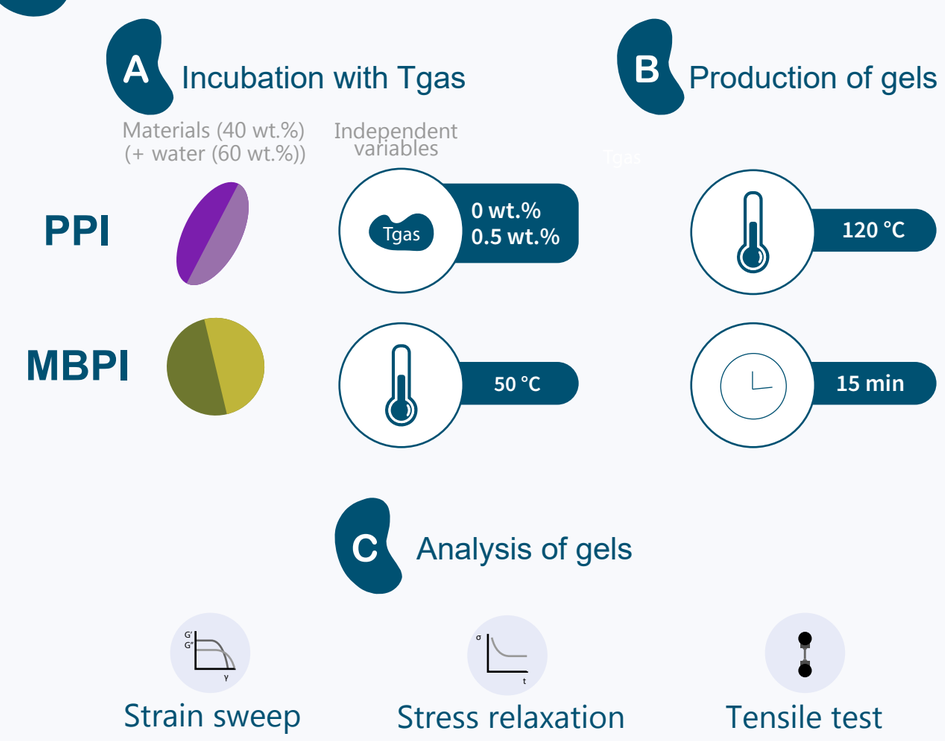
Gelation is an important functional property in production of meat analogues.

& have lower gelling capacity than soy protein isolate

Possible solution:

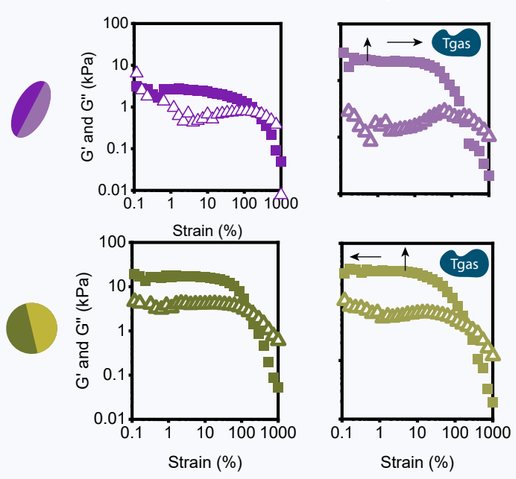
Tgas — Transglutaminase can **increase crosslinking** between lysine and glutamine groups in proteins → Increased gel strength

2 METHODS



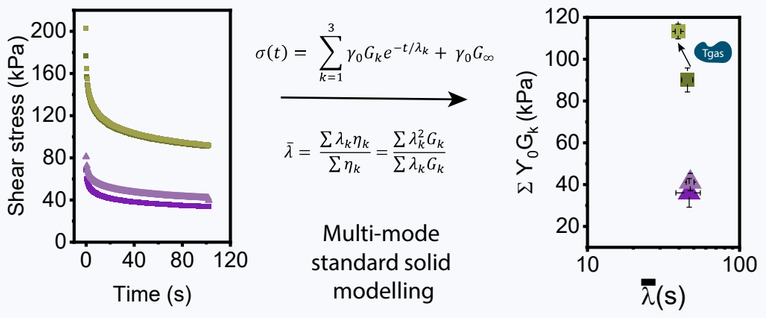
3 RESULTS

Strain sweep



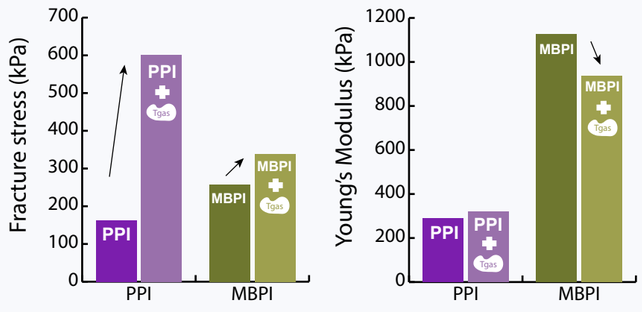
Upon Tgas addition:
- G' of PPI and MBPI increase
- LVR of PPI extends
- LVR of MBPI narrows

Stress relaxation



Upon Tgas addition
- Average relaxation time of MBPI decreases: indicating a shift to smaller clusters
- No change is observed in PPI

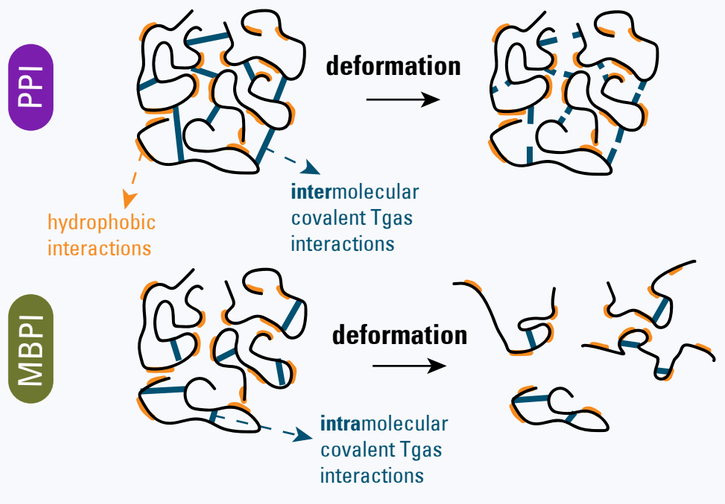
Tensile test



Upon Tgas addition:
- Fracture stress of PPI gels increases to a larger extent than MBPI gels
- Young's Modulus of MBPI gels decreases

4 CONCLUSIONS

- Tgas affects PPI to a larger extent than MBPI
- Differences between PPI and MBPI attributed to accesibility of lysine and glutamine groups
- **Inter**molecular Tgas crosslinks are formed in PPI: creating a complete network
- **Intra**molecular Tgas crosslinks are formed in MBPI: creating small clusters



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