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Effect of structural parameters on rheological behaviour of reconstructed puree

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Context

In food industry, controlling texture allows to generate innovative products and to deal with consumer expectations or physical issues (ex. swallowing problems due to ageing).



Source: <http://www.annabelkarmel.com/recipes/first-apple-puree>

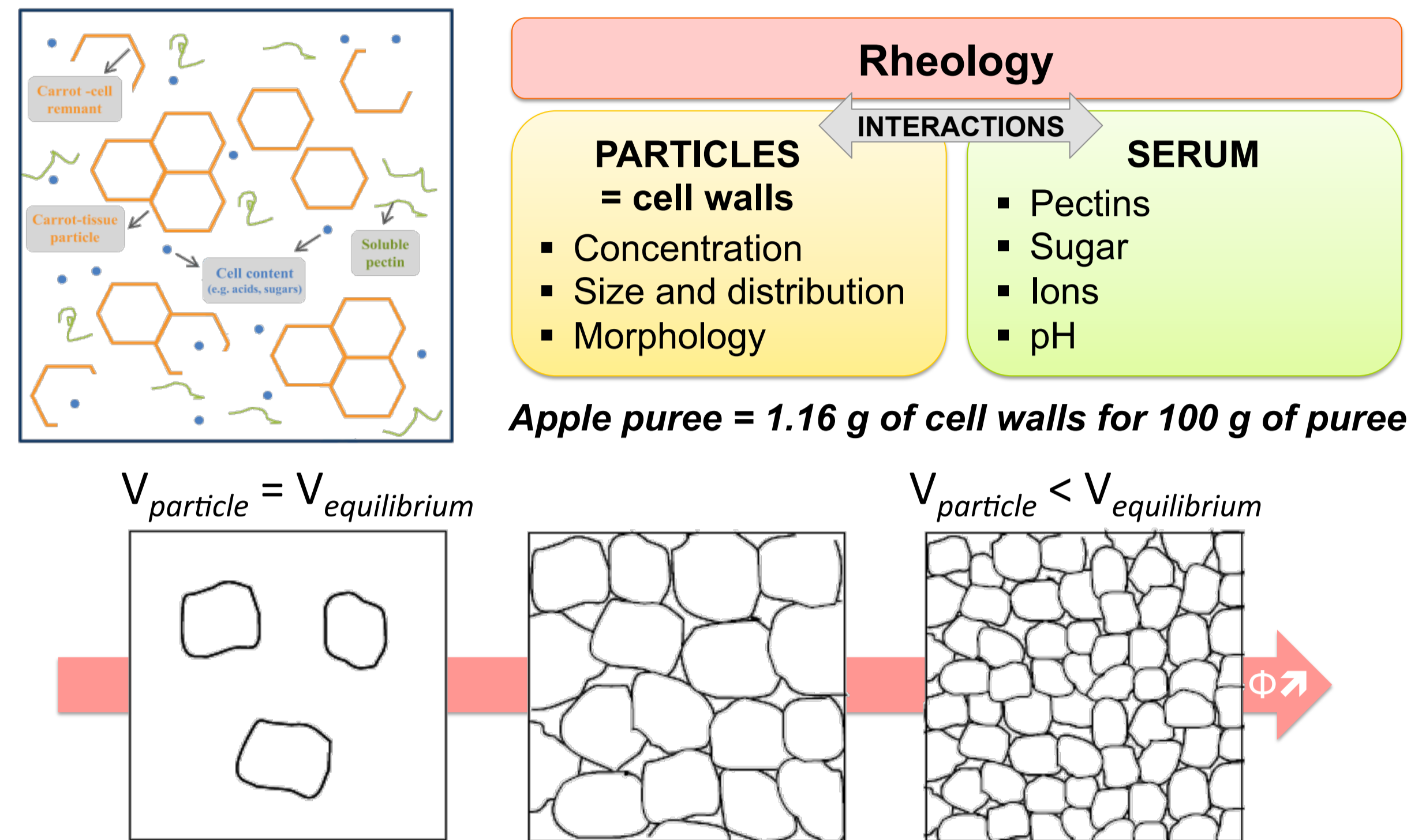


Source: care4brain.com/tag/intervention-for-demented-elderly/

Research question: **How does fruit suspension structure impact its behaviour ?**

Strategy

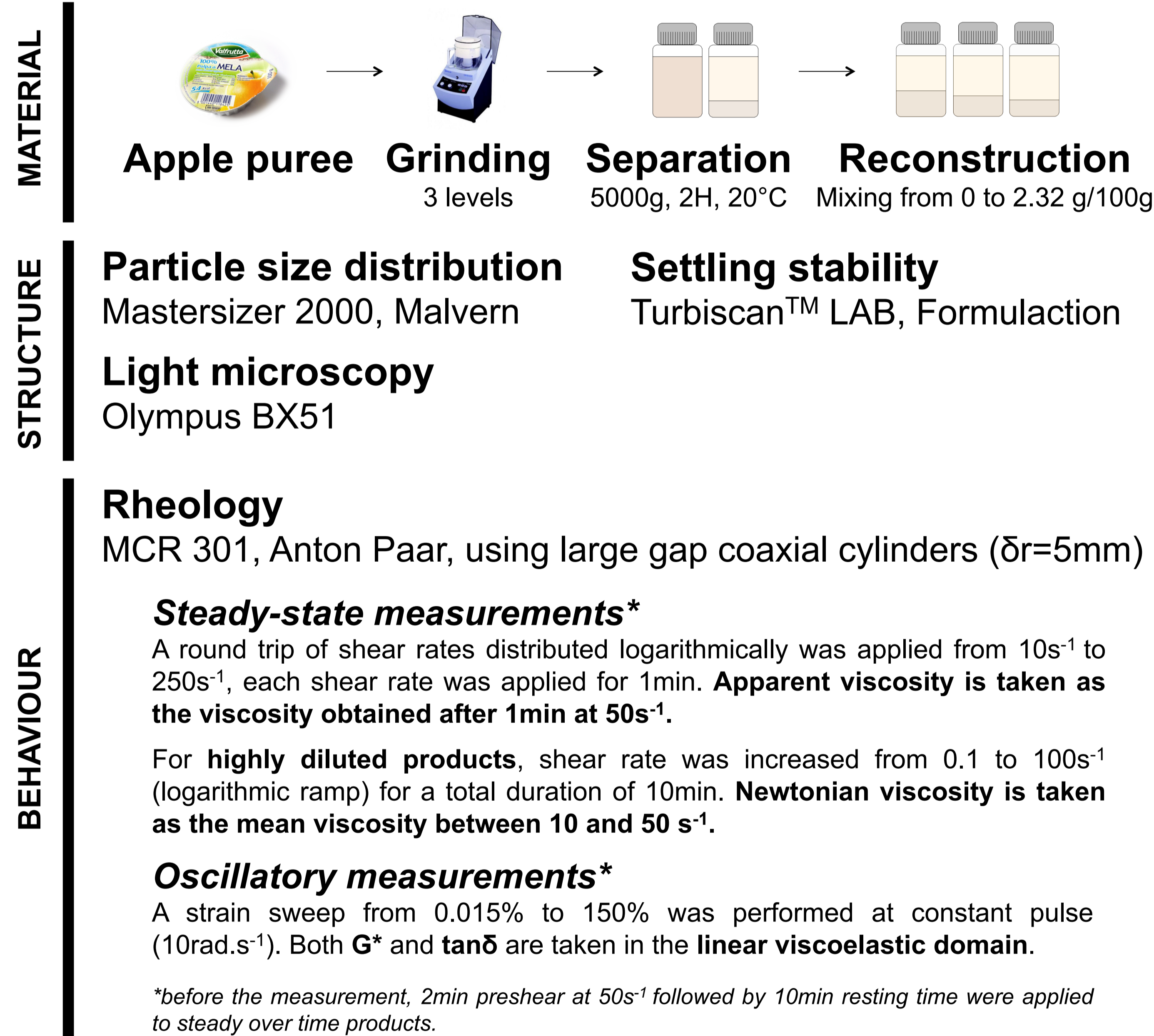
Fruit puree = vegetable deformable cells suspension



Construction of apple purees varying in :

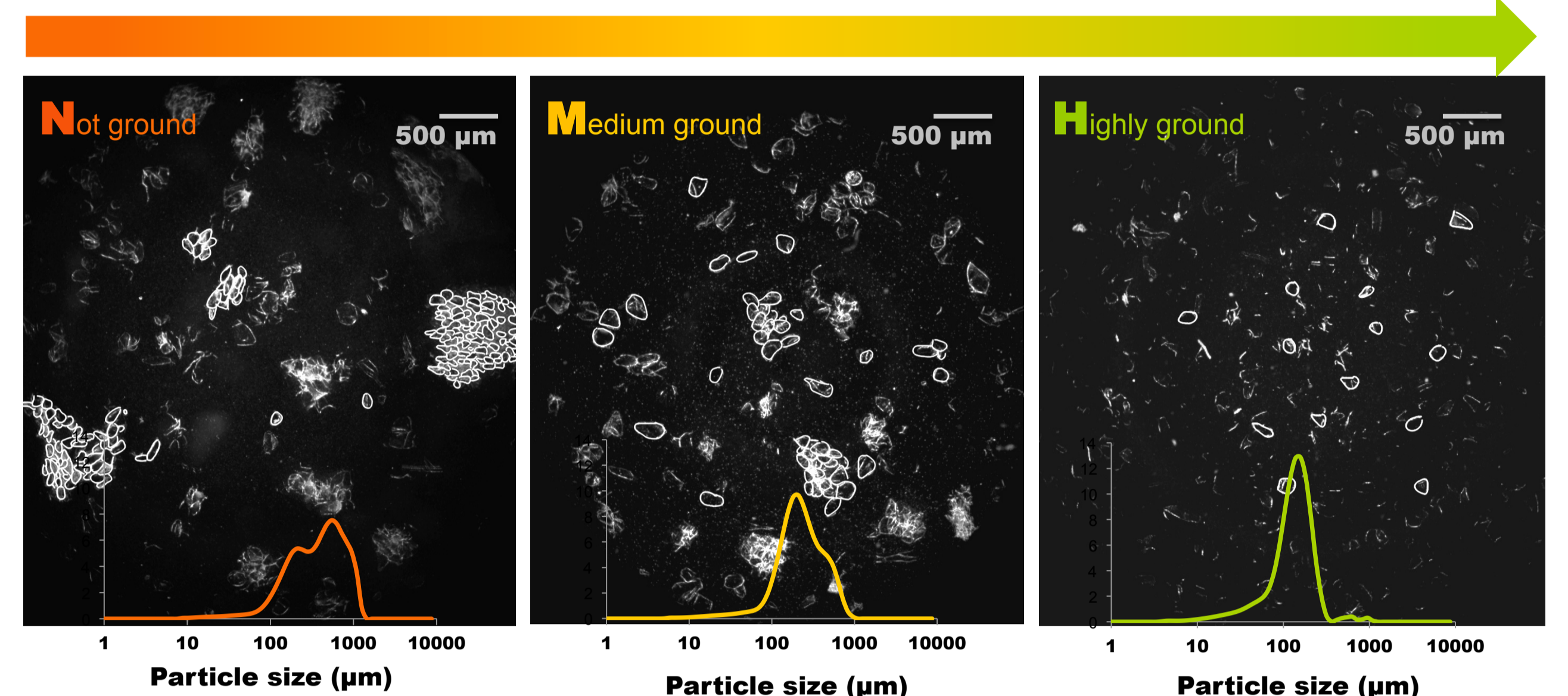
- ✓ particle size (, , and)
- ✓ particle concentration (from 0 to 2.32g/100g)

Material & Methods

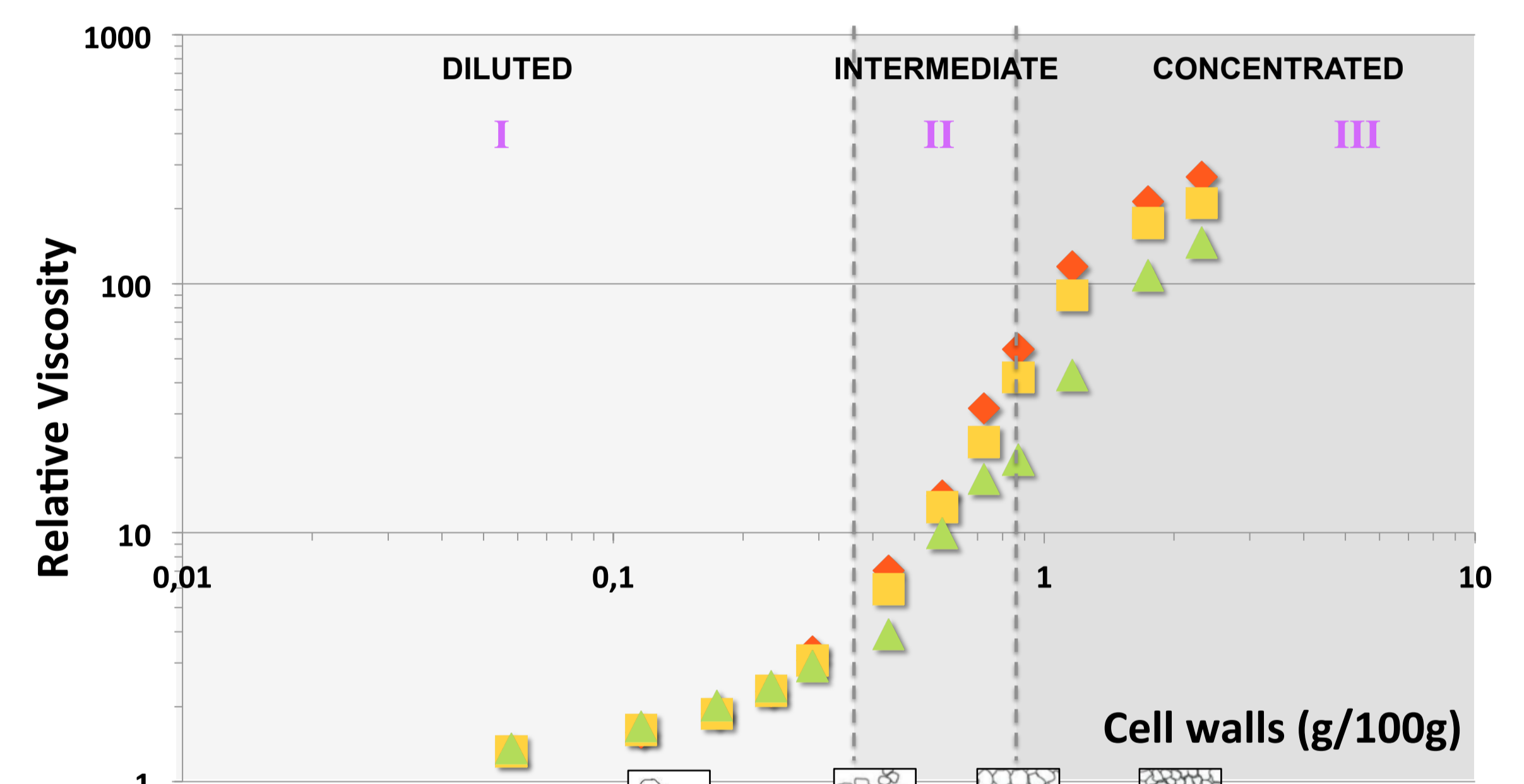


Results

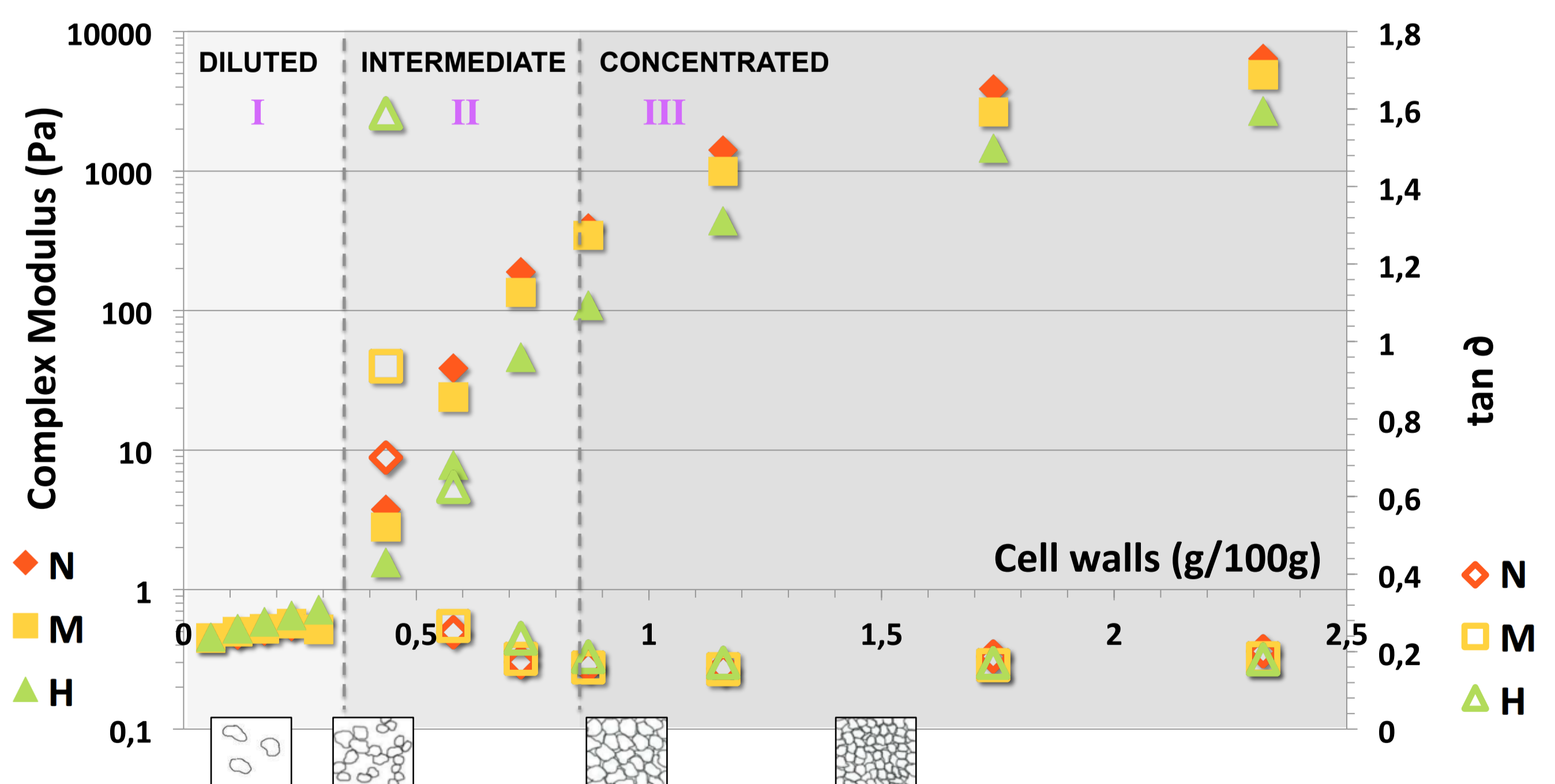
Impact of grinding process on cells structure and size



Impact of cell structure and concentration on rheological behaviour : 3 concentration domains (I, II, III)



- I Size and shape have a small impact on rheology
- II Appearance of a weak network
- III Particles begin to pack



Conclusion & Perspectives

- Rheological measurements have been performed on a wide range of concentrations with variable particles size distribution.
- Three concentration domains are visible, in both flow and dynamic measurements:
 - ✓ **Diluted regime:** Newtonian flow. Particles size and shape have little effect on rheology.
 - ✓ **Semi-diluted regime:** Existence of a weak network between particles.
 - ✓ **Concentrated regime:** The dependence between viscosity and concentration decreases. Particles begin to pack and their volume becomes lower than their equilibrium volume.
- **Next step:** determine the volume occupied by the particles in each domain, access to Φ , determine the influence of the continuous phase and the influence of intrinsic properties of the particles.

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Contact

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