

Department Materials Science – CENIMAT/I3N

## Real time rheology of a living bacteria culture

SBMG – Soft and Biofunctional Materials Group



Catarina A. R. Leal

Materials Science Engineering – FCTUNL 87/92

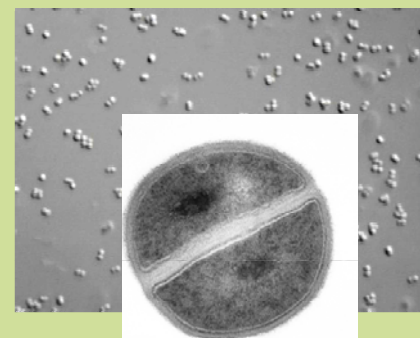
Materials Science Master – FCTUNL 93/94

Materials Science PhD – FCTUNL 95/01

Prof. Coordenador, ADF/ISEL

## Objectives

- Characterization of the rheological properties of planktonic bacteria populations.
- Characterization of the activity of the bacteria cells during their growth in culture, in particular to evaluate the role of their aggregation properties.

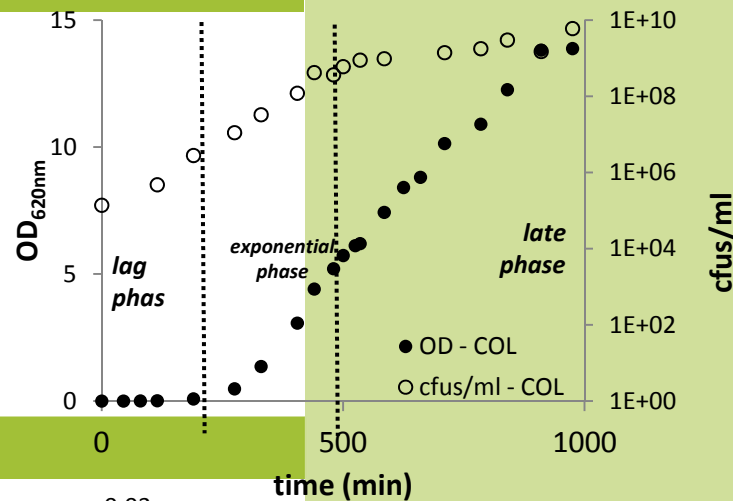


$\phi = 0,5-1 \mu\text{m}$ ; SEM

## Methodology

*Staphylococcus aureus* bacteria are round in shape and can form aggregates with 5-20 cells, like clusters of grapes, which gives them the greek name *Staphylo-coccus*. It is a human pathogenic bacterium, famous for its virulence and ability to accumulate antibiotic resistance.

Experimental techniques: Optical density 620nm, cfus/ml, Rheology



## Expected Results

Main results;

Steady-state shear flow: Viscosity growth curve  
Oscillatory shear-flow:  $G'$  and  $G''$  vs angular velocity (not inc.)

### References:

Portela, R., P. L. Almeida, P. Patrício, T. Cidade, R. G. Sobral and C. R. Leal (2013). *Physical Review E*, 87, 030701(R).  
P. Patrício, P. L. Almeida, R. Portela, R. G. Sobral, I. Grilo, T. Cidade and C. R. Leal (submitted, Dec. 2013)

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