

# PhD Open Days



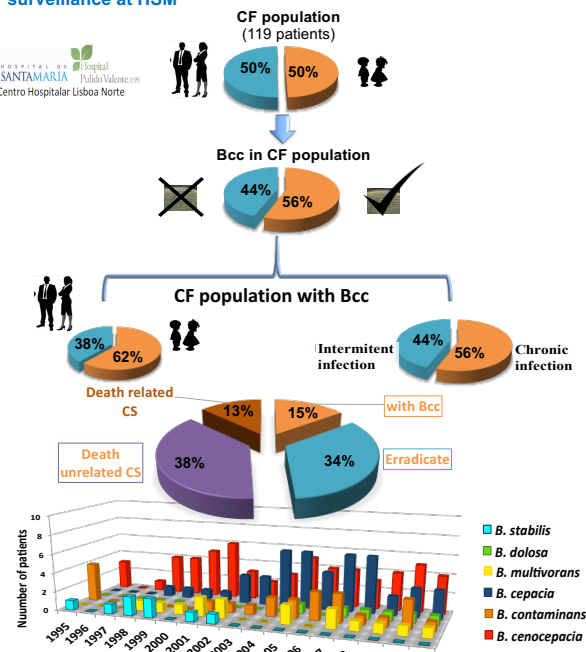
## Adaptation of *Burkholderia cepacia* complex bacteria to the cystic fibrosis lung: focus on lipopolysaccharide O-antigen variation during chronic infection

PhD-Biotechnology and Biosciences

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### Overview of the big data collection

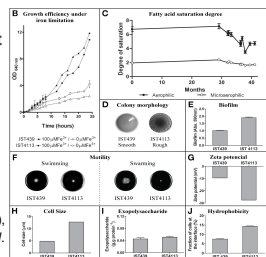
A 20-year retrospective study using the – IST collection- Bcc bacteria retrieved along the chronic infections from CF patients under the surveillance at HSM



To understand genomic and phenotypic evolution of the clonal variants of Bcc within the CF lung

A) Genotyping for species and clonal identification  
MLST, RAPD, PFGE, and PCR

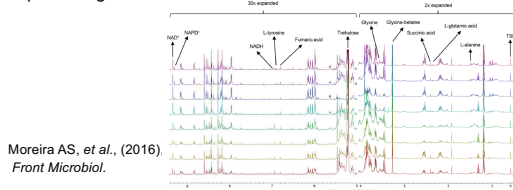
B) In vitro phenotypic assessment



Coutinho CP, et al., (2011), *Front Cell Infect Microbiol.*

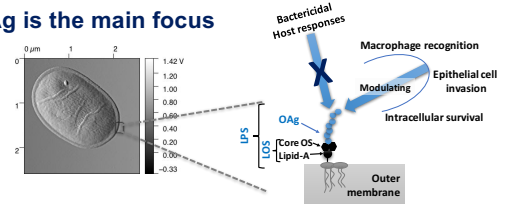
C) Post-genomic approaches

Transcriptomic, Metablotomic, Expression proteomic, NGS and comparative genomics



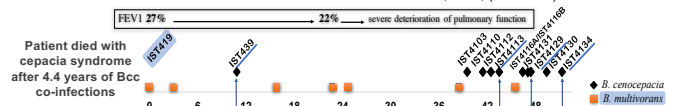
Moreira AS, et al., (2016), *Front Microbiol.*

### The LPS OAg is the main focus

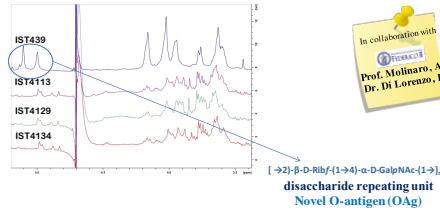


### Novel O-antigen and hybrid biosynthetic locus in *Burkholderia cenocepacia* clonal variants recovered from a cystic fibrosis patient

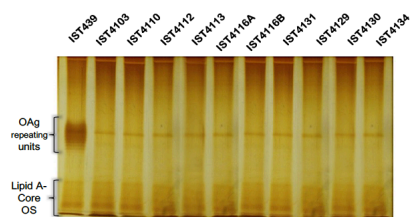
Hassan AA, et al., (submitted) *Front Microbiol*



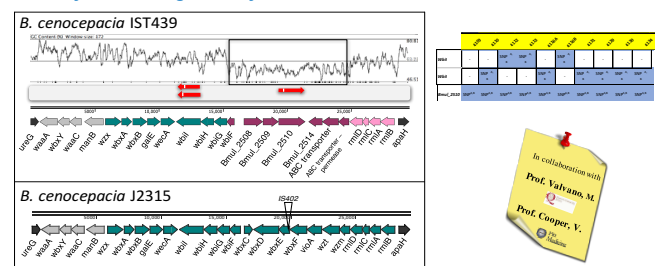
#### I) New LPS chemical composition differs than the ET-12 clones



#### II) All late-stage clonal variants lack the OAg



#### III) Genomic sequence of the *B. cenocepacia* clonal isolates reveals of a novel hybrid O-antigen biosynthetic cluster



In collaboration with Prof. Vayns, M. Prof. Cooper, V.

### Applications

- In general, the research team is working to understand how Bcc evolves in the CF airways during long-term infection to guide the development of new therapeutic strategies to treat severe chronic infections
- In particular, the shown data supports the notion that O-antigen modifications are important in the adaptation of *B. cenocepacia* to chronic infection and paves the way to improve the management of these feared respiratory infections in CF patients