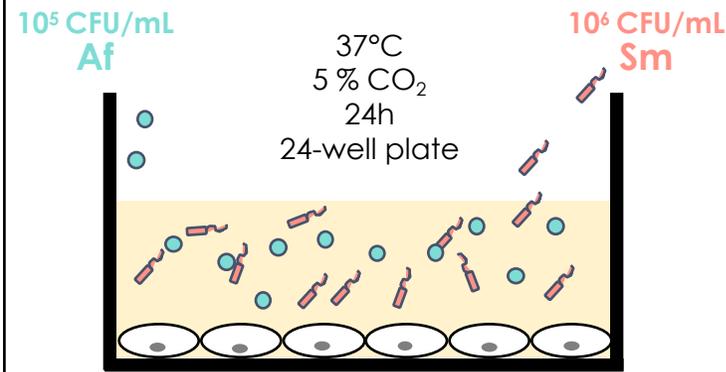


# Differential inflammatory response of bronchial epithelial cells to *Aspergillus fumigatus* - *Stenotrophomonas maltophilia* isolates derived from CF individuals

*A. fumigatus* (Af) and *S. maltophilia* (Sm) are commonly co-isolated from the airways of **cystic fibrosis** (CF) patients. Chronic respiratory infections are difficult to treat, probably due to the mixed microorganisms that developed in **biofilm**. Aim: to study the development of Af + Sm on bronchial epithelial cells (BECs), as well as the epithelial damage and inflammatory response of cells following exposure to the mixed biofilm.

REF strains: AF\_REF (ATCC 13073) + SM\_REF (ATCC 13637)  
CF strains: AF\_CF + SM\_CF



Confluent **BEAS-2B cells**  
Medium: F-12 + FBS + HEPES

Single (Af or Sm) and mixed (Af + Sm) infections

Analyses:

Microscopy (**SEM, CLSM**)  
Pathogen growth (**qPCR**)  
Cellular stress (**lactate assay**)

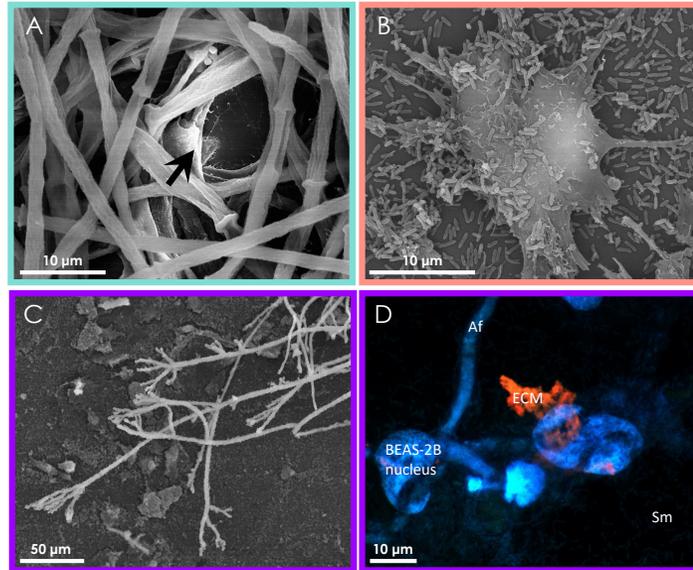
Inflammatory response (**IL-6 & IL-8**)

Protease activity of Sm (**skim milk agar plates**)

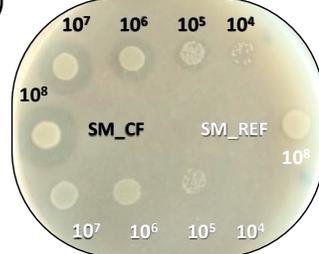
## Conclusion:

This work is the first mixed biofilm model of Af, Sm, and BECs. CF strain of Sm exhibits distinct metabolic features, hence the importance of using CF strains for cystic fibrosis research.

**Fig 1: Observation of 24 h-biofilm formed by CF isolates on BEAS-2B cells.** A-C, SEM images of BEAS-2B (arrow) exposed to Af (A), Sm (B), and Af + Sm (C). D, CLSM image after DAPI staining of BEAS-2B exposed to Af + Sm. Red fluorescence indicates extracellular matrix (ECM) stained with Concanavalin A.



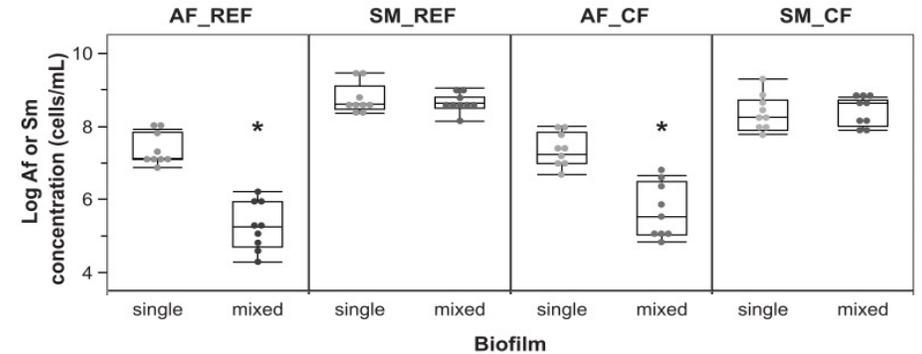
**Fig 4: Protease secretion from Sm determined as the clearance zone on skim milk agar.**



Sm strains behave differently:

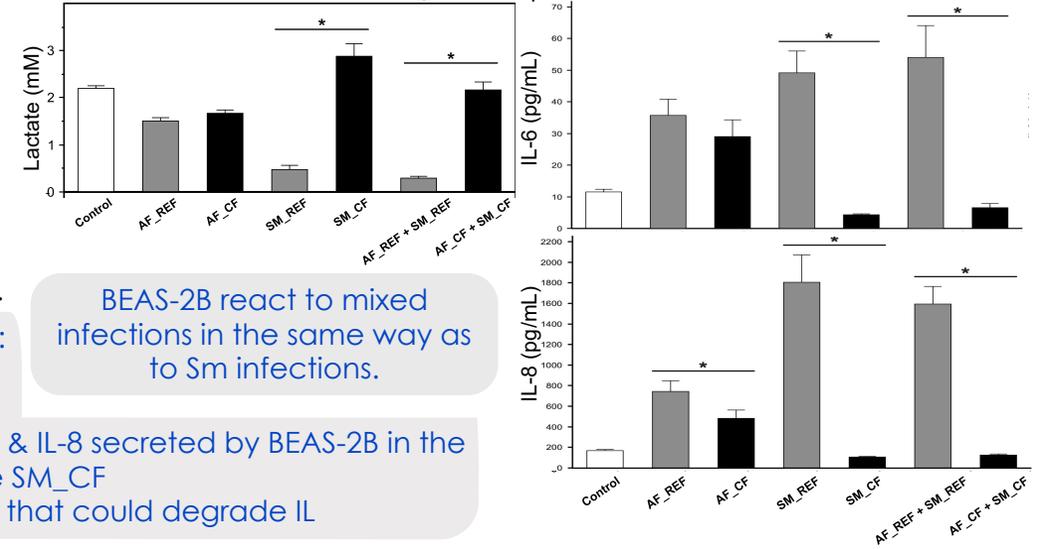
- SM\_CF secretes lactate while SM\_REF consumes it
- High concentration of IL-6 & IL-8 secreted by BEAS-2B in the presence of SM\_REF unlike SM\_CF
- SM\_CF secretes proteases that could degrade IL

**Fig 2: Antibiosis effect of Sm on Af growth assessed by qPCR.** \* $p < 0.05$



Sm inhibits the growth of Af and modifies the hyphae structure.

**Fig 3: Lactate, IL-6, and IL-8 concentration measured in the culture supernatants of BEAS-2B infected with Af and/or Sm.** \* $p < 0.05$



BEAS-2B react to mixed infections in the same way as to Sm infections.