

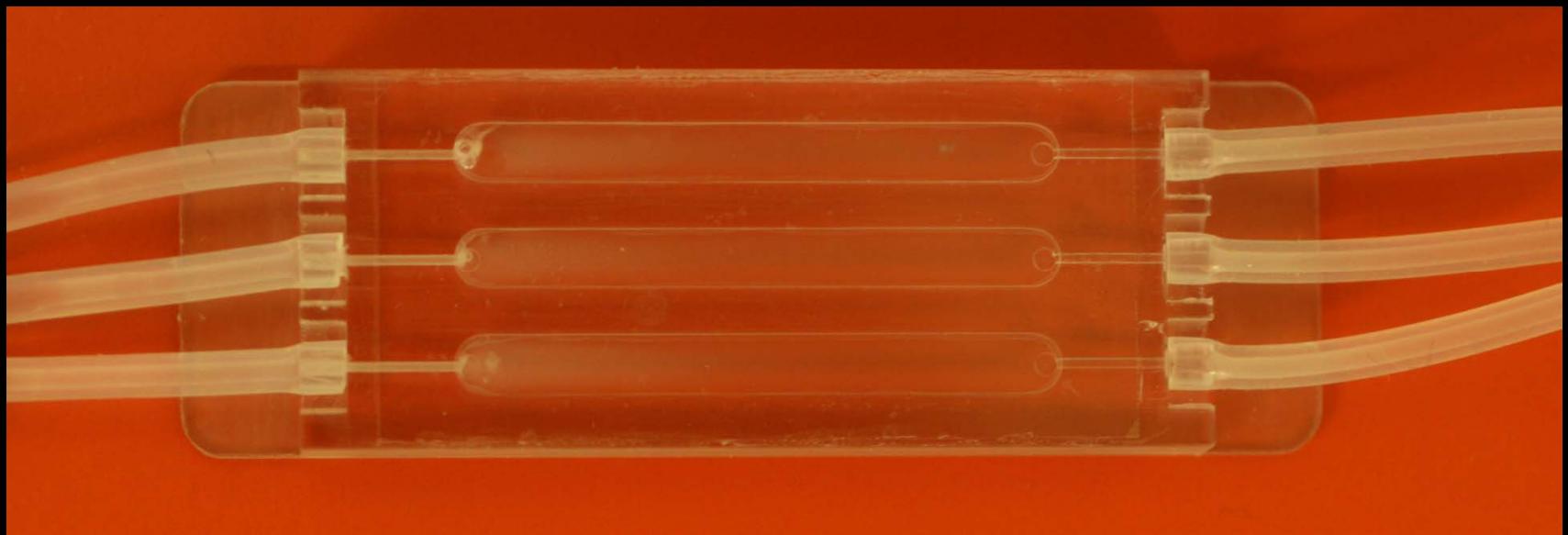
# Biofilm studies using flow-chambers and fluorescence visualization.

Tim Tolker-Nielsen

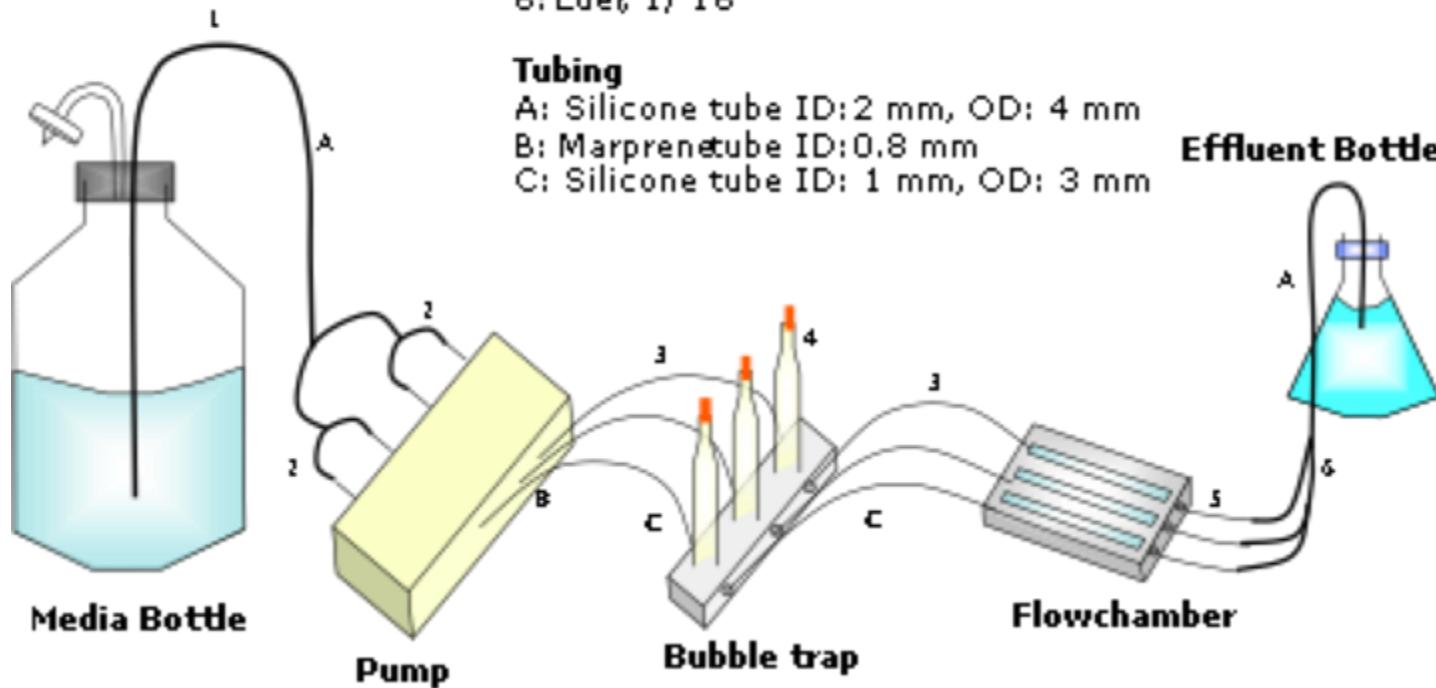
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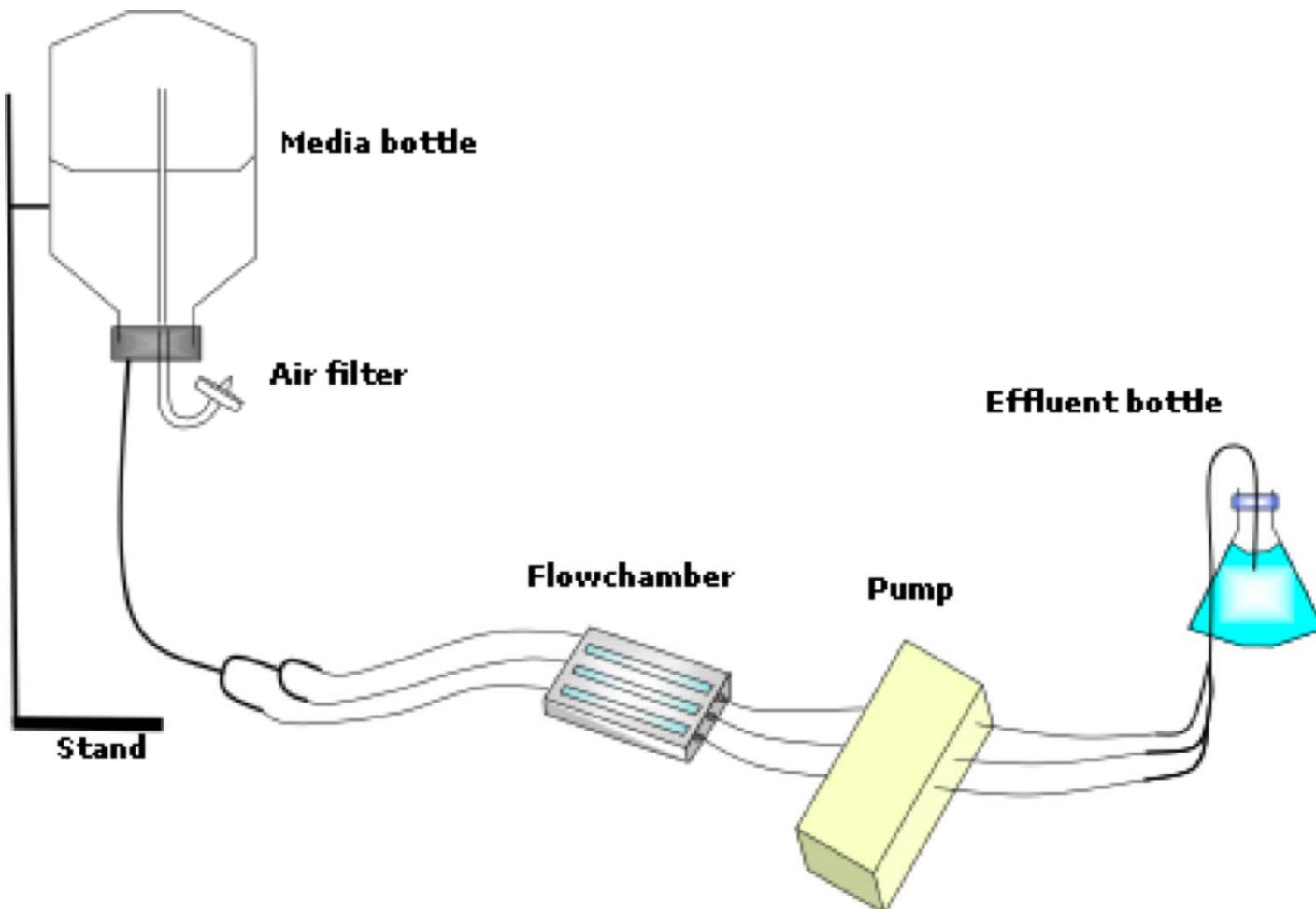
# A flow-chamber



# The DTU flow-chamber set-up.

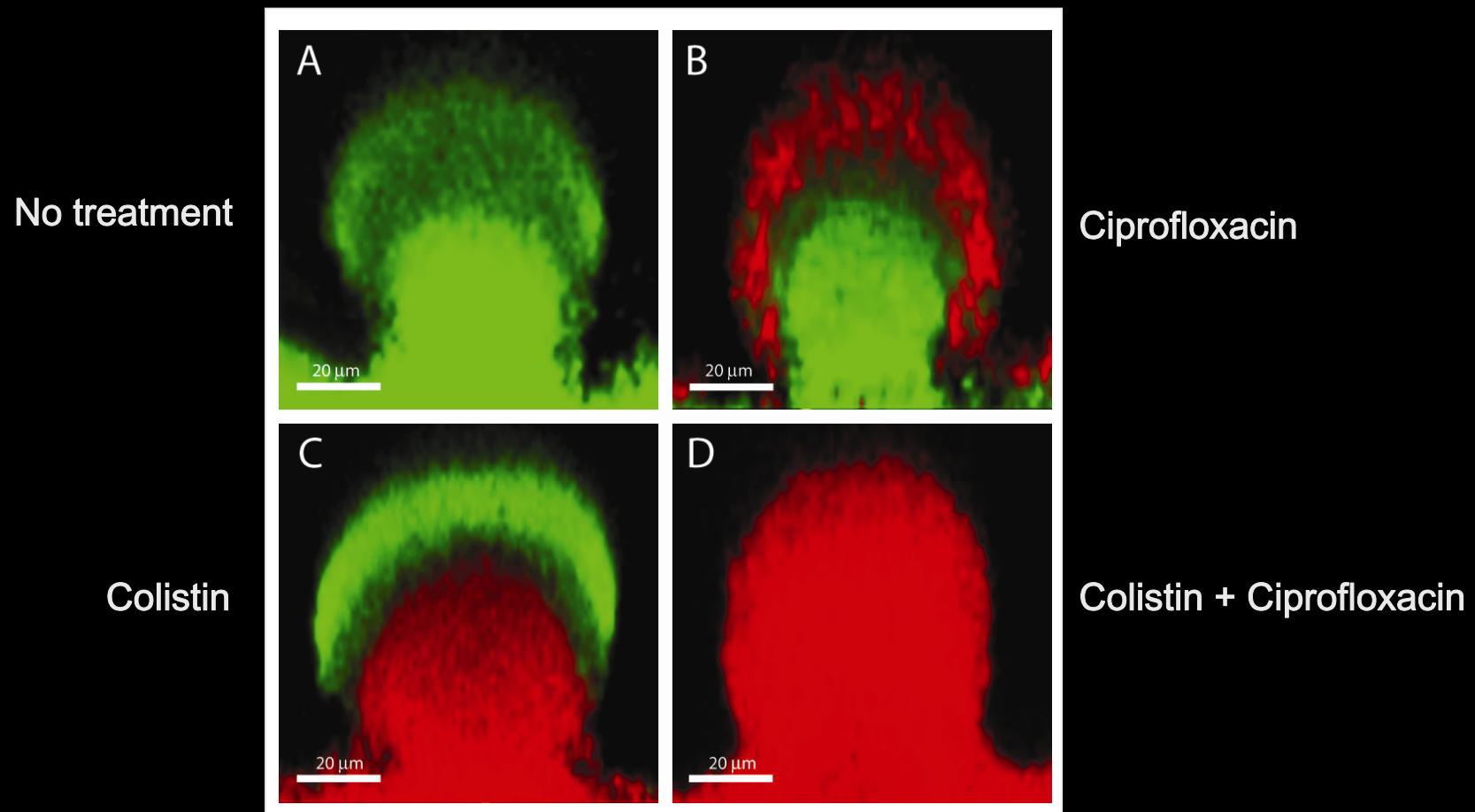


# The Nottingham flow-chamber set-up.



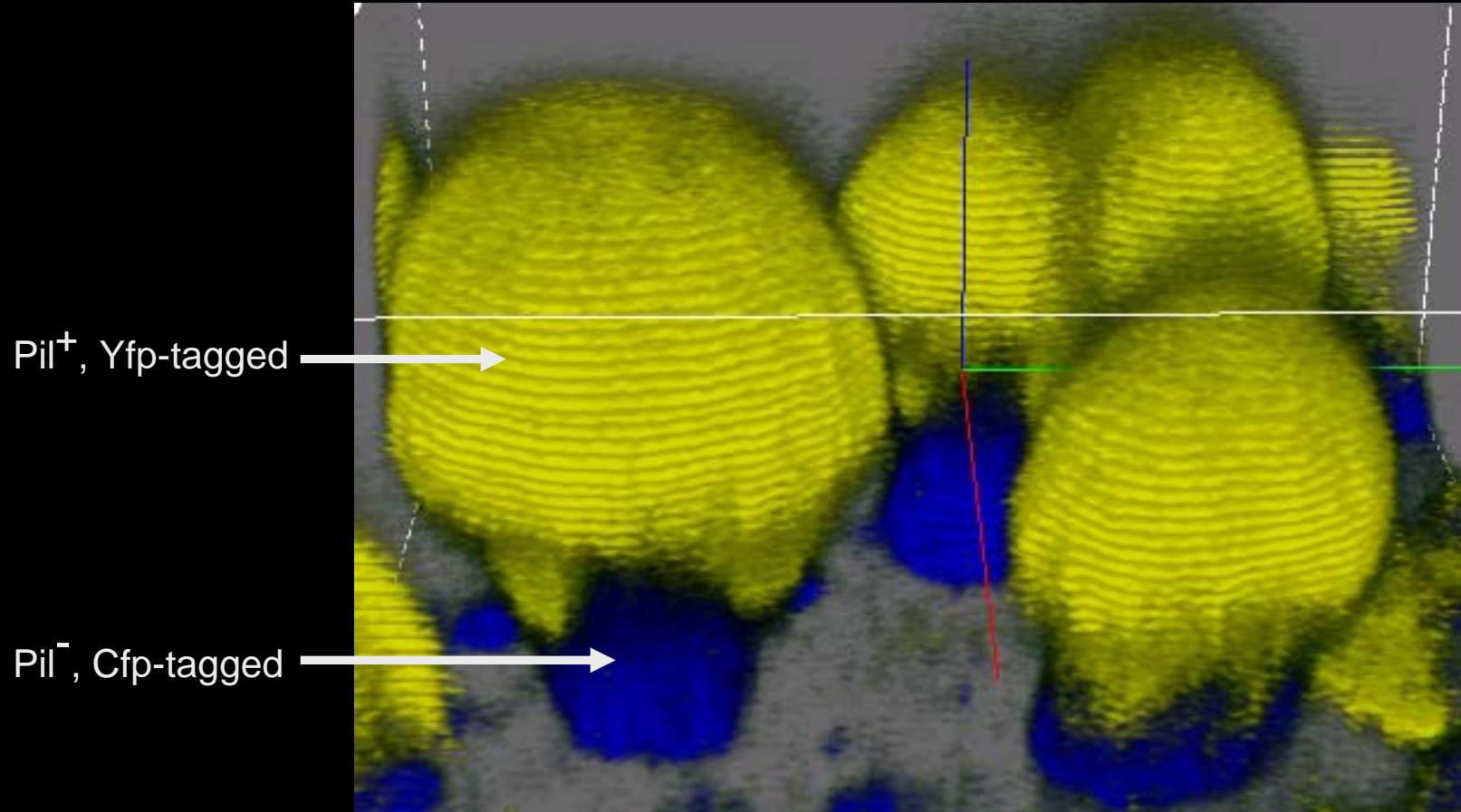
# Fluorescent staining

# Antibiotic tolerance in *Pseudomonas aeruginosa* biofilms.

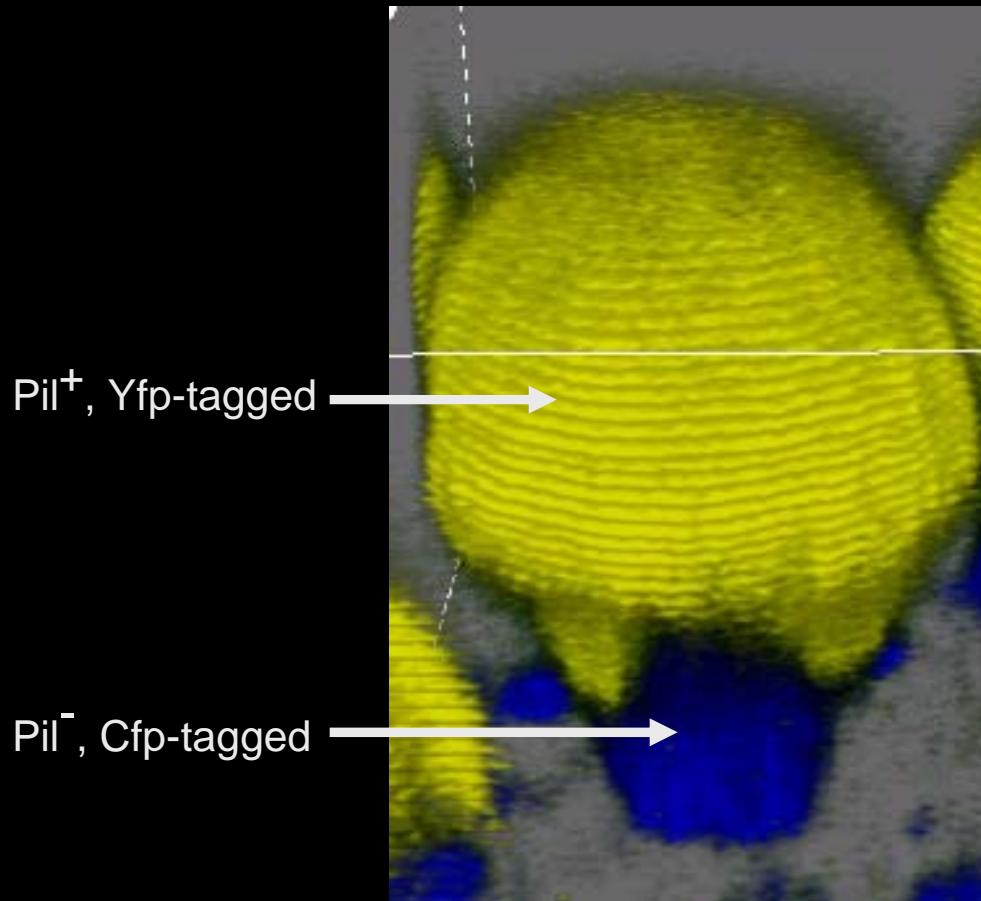


# Fluorescent protein tagging

# Mechanisms involved in *Pseudomonas aeruginosa* biofilm formation.



# Mechanisms involved in *Pseudomonas aeruginosa* biofilm formation.

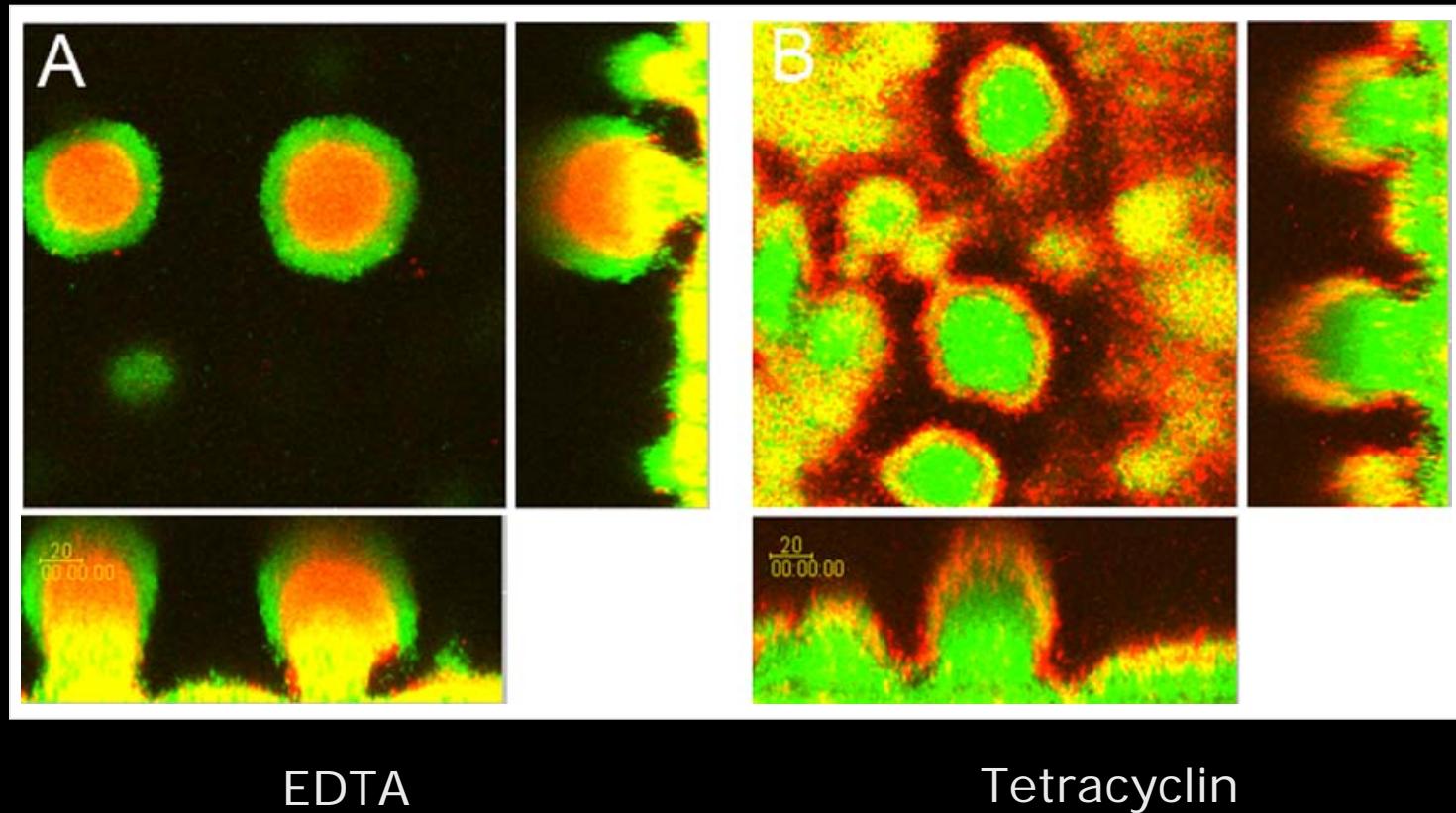


We have used a similar strategy to investigate roles in biofilm formation of:

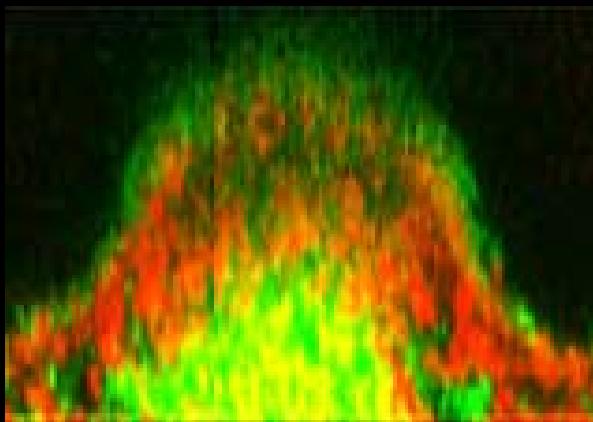
- Flagella.
- Chemotaxis.
- Biosurfactant.
- Quorum-sensing.
- DNA-release.
- Iron uptake.

# Fluorescent protein tagging and fluorescent staining

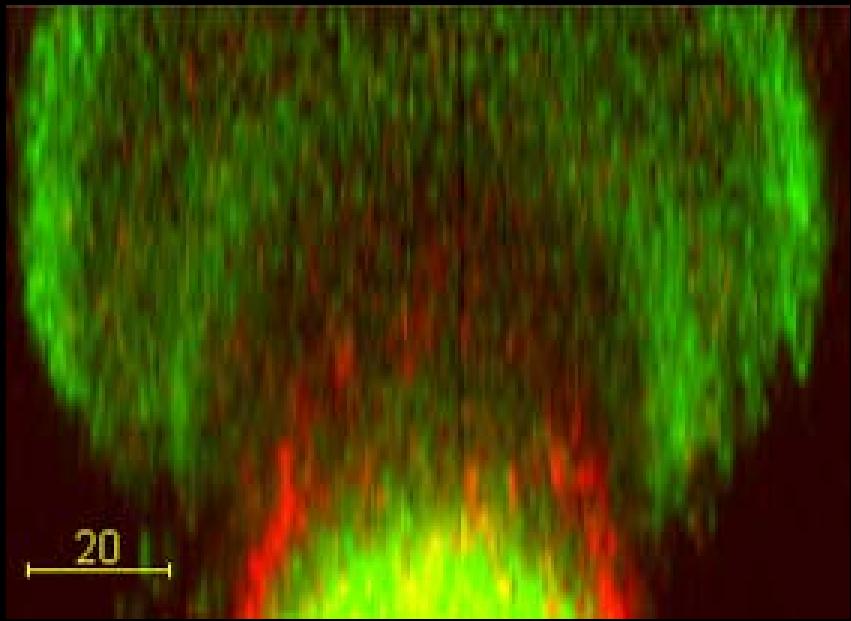
# Antibiotic tolerance in *Pseudomonas aeruginosa* biofilms.



# Visualization of extracellular DNA in *P. aeruginosa* biofilms



2-day-old biofilm

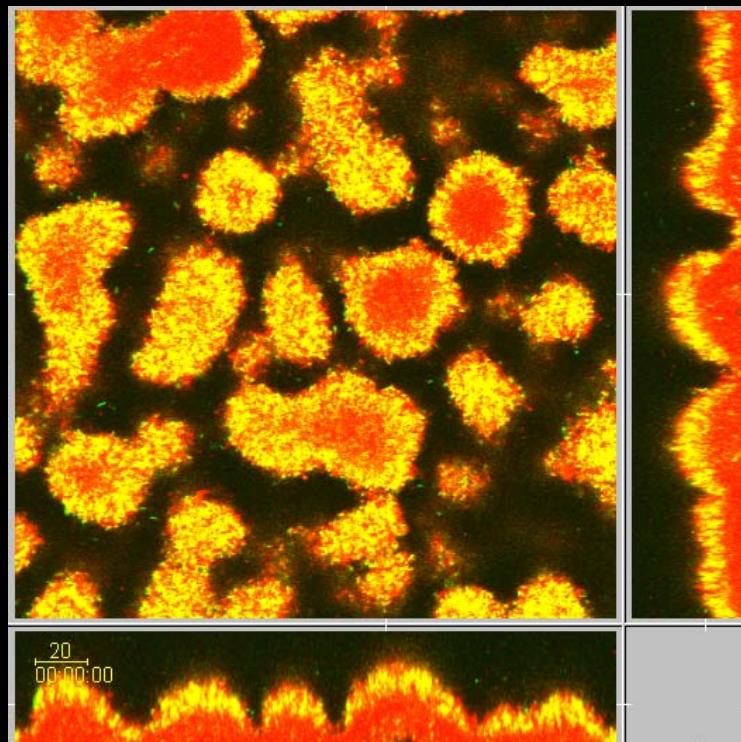


4-day-old biofilm

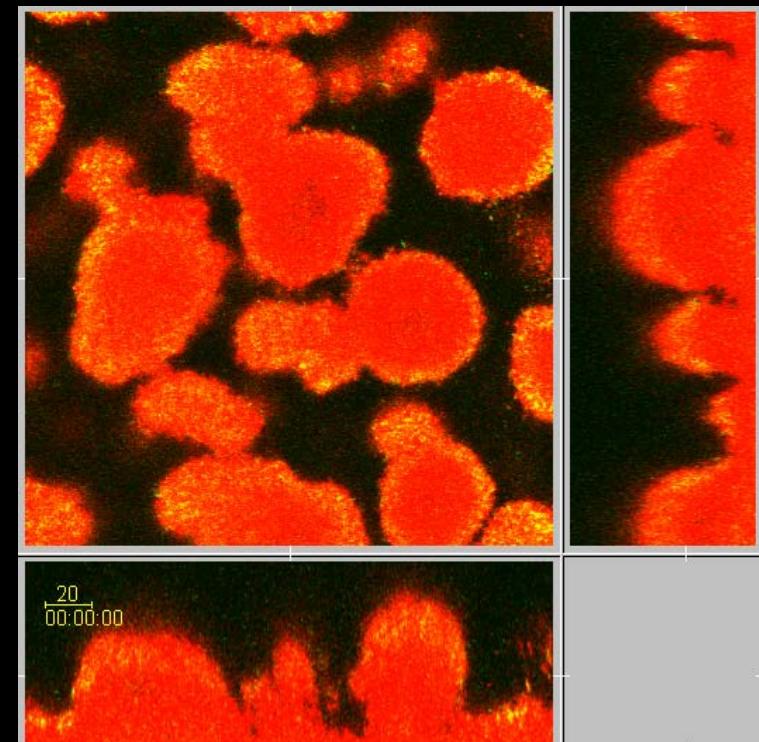
# Fluorescent reporters and fluorescent staining

# Spatio-temporal expression of the *pqs* operon in *P. aeruginosa* biofilm

CLSM sections acquired in *P. aeruginosa* /*pqsA::gfp<sub>ASV</sub>* biofilms



2-day-old biofilm



4-day-old biofilm

# Acknowledgments

Liang Yang

Marie Allesen-Holm

Sünje Pamp

Mikkel Klausen