Staphylococcal research at the University of Nebraska Medical Center (UNMC)
Fighting Drug Resistant Infection

-6 faculty members doing staph research

-1 $11 million P01 grant focused on staph biofilm

-4 $1 million+ R01 grants

-multiple other grants (CDC, DoD, AHA, etc…)

First DoD Funding

-$1.9 mil DoD grant to generate critical tools for the research community

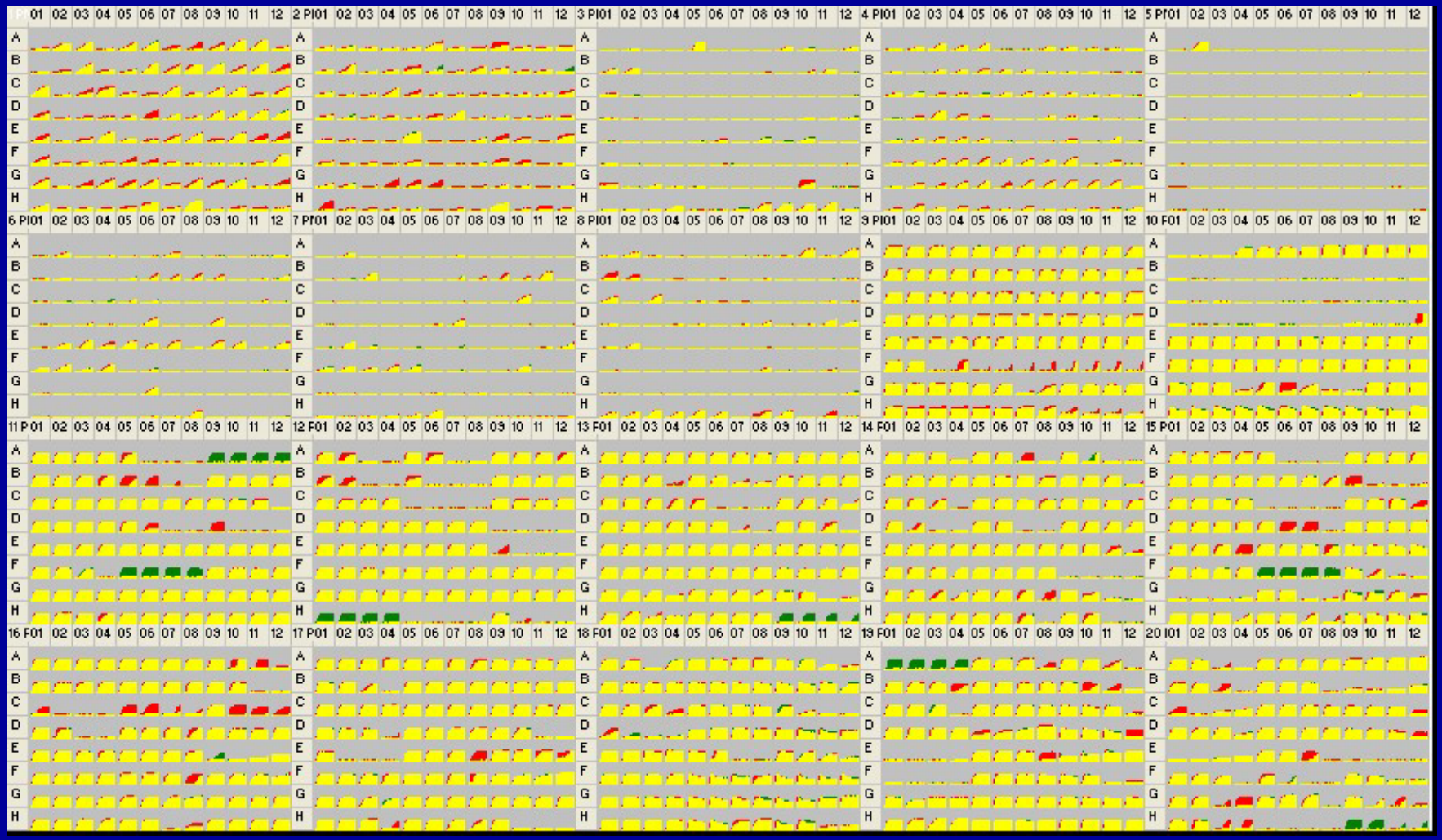
-employees six individuals

“The Nebraska Library”

A collection of mutants in which every non-essential gene in the *S. aureus* genome has been disrupted

Available for distribution through NARSA (the Network on Antimicrobial Resistant *Staphylococcus aureus*)

Phenotype microarray data using Biolog technology



The Nebraska Center for Staphylococcal Research (CSR)

Objectives of the CSR

-develop novel therapeutics

-develop molecular/genetic tools

-serve as a training center

-provide a resource for individuals affected by staphylococcal disease

-serve as a nidus for development of clinical research programs

Second DoD Funding

-collect staphylococcal clinical isolates

-sequence genomes (deep sequencing technology and computer infrastructure)

-look for signature sequences

Impact of project on Nebraskans

-four additional research personnel employed

-state-of-the-art technology brought to our state

Impact of project on people

-lead to new insight into device-related infections

-identify targets for the development of novel diagnostic strategies

-identify targets for the development of novel therapeutic agents

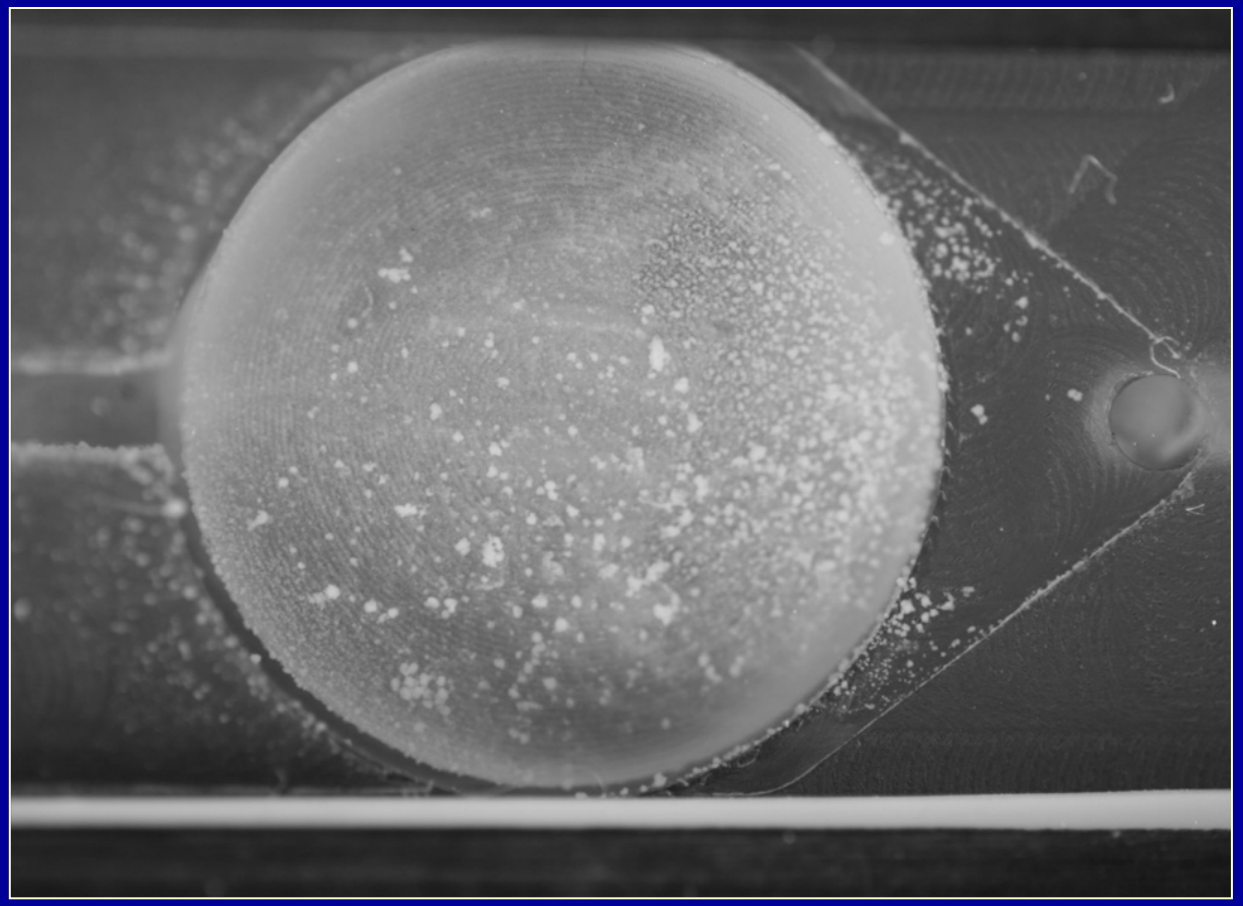
Impact of staph on our military personnel

-most common cause of skin and soft tissue infections

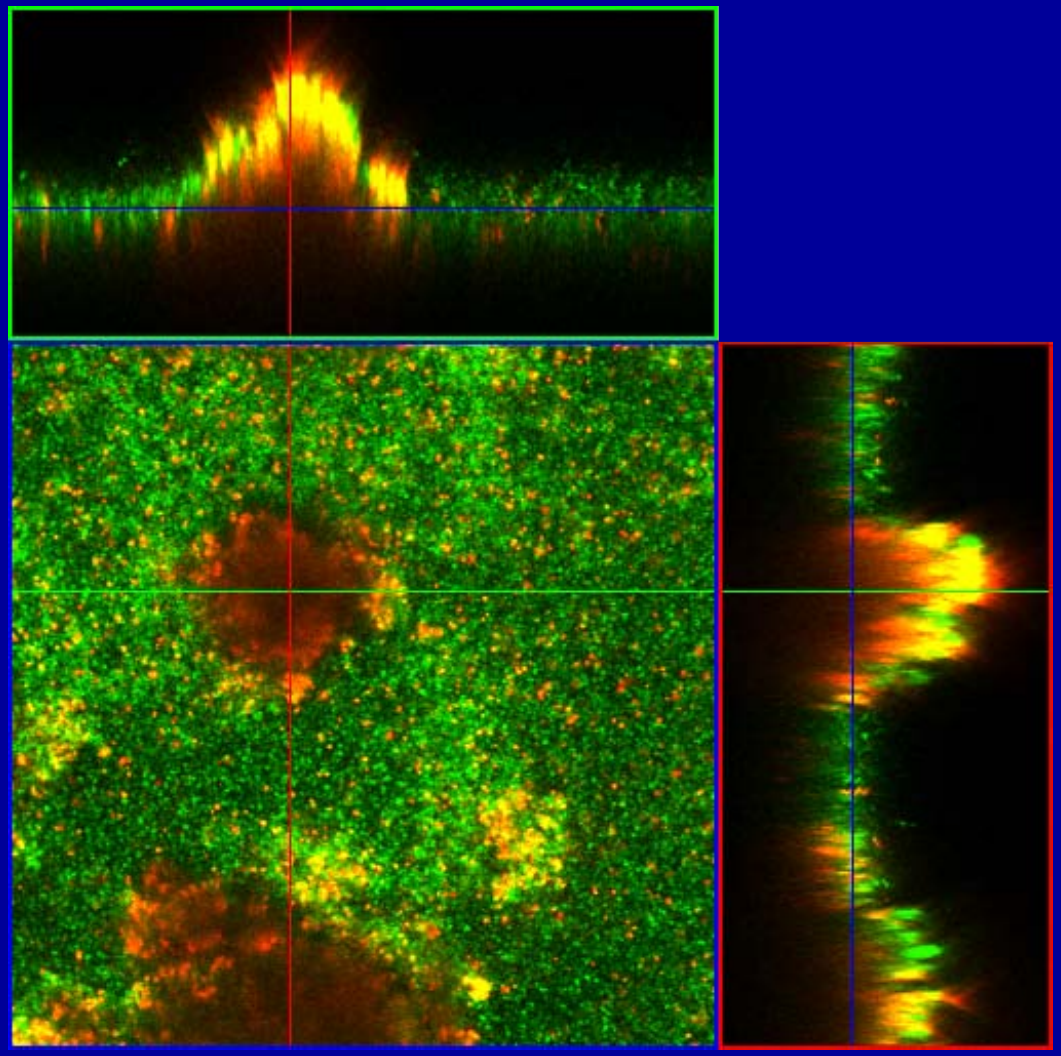
-most common cause of prosthetic device-related infections

-most common cause of battle wound infections

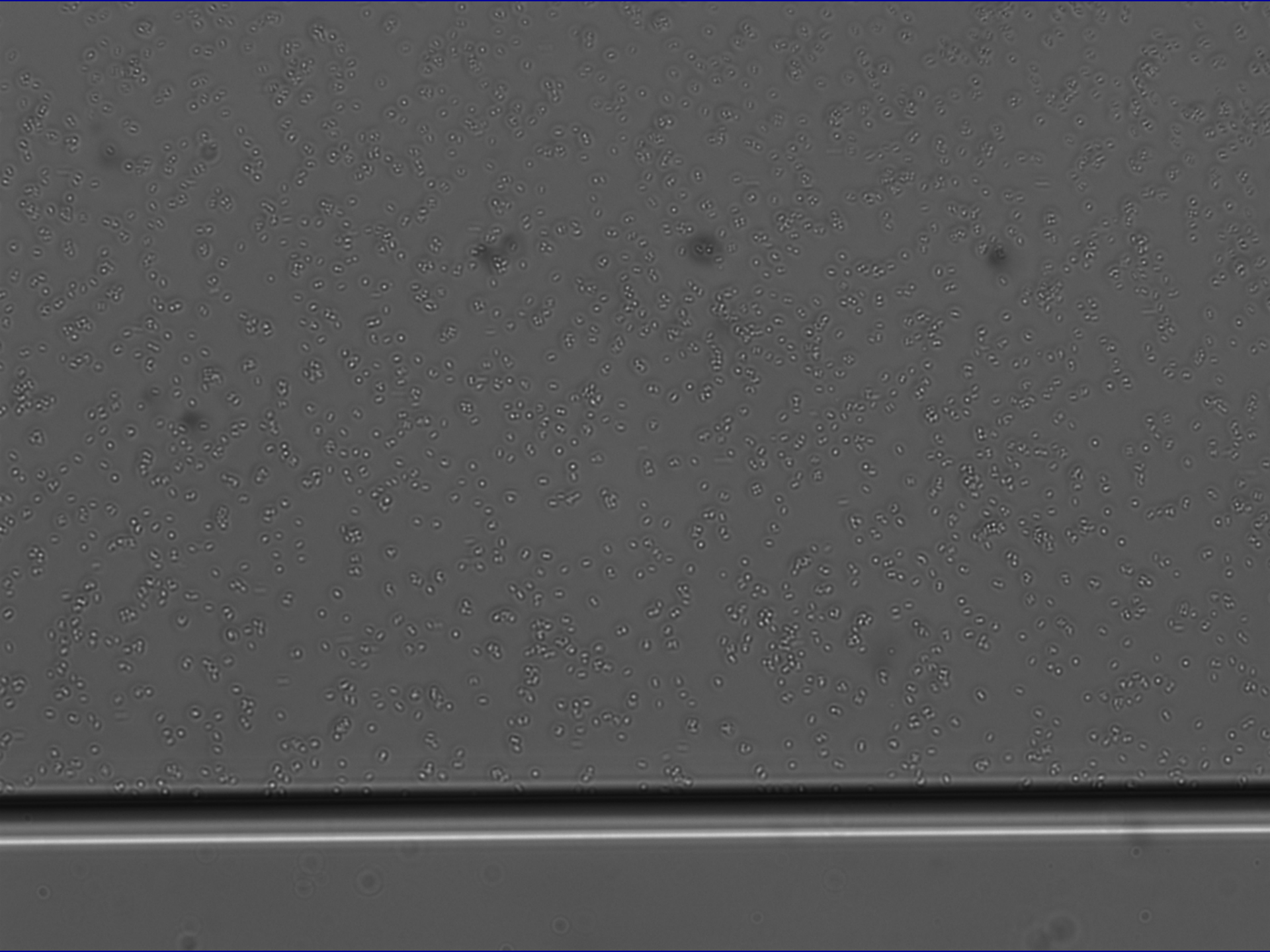
Staph biofilm



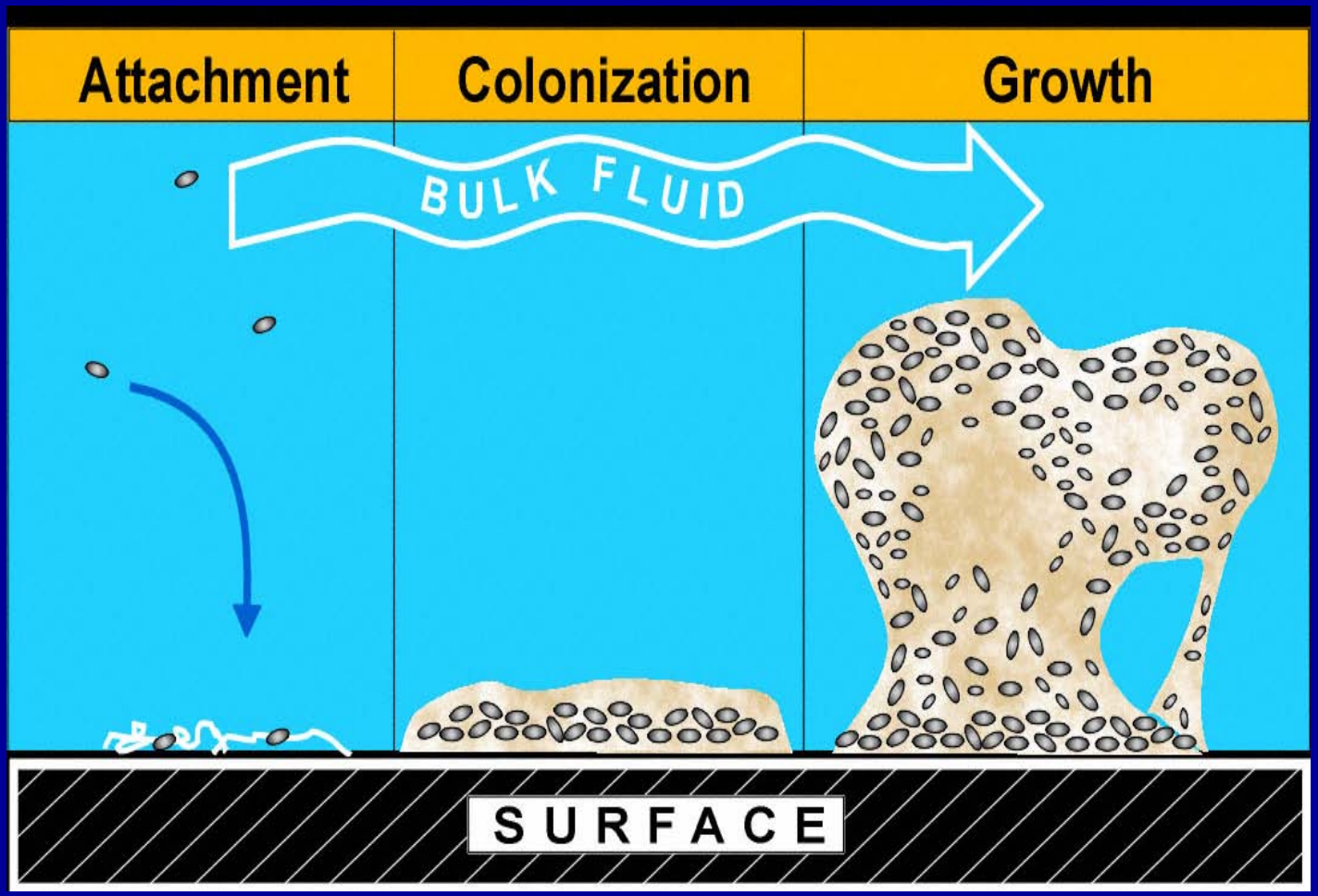
Differential control of cell death and lysis during biofilm development



Mann et al. 2009. PloS ONE 4:e5822



Bacterial biofilm formation



Adapted from MSU Center of Biofilm Engineering
http://www.uweb.engr.washington.edu/research/tutorials/biofilm.html