



In Depth Characterization of Bacterial Biofilms in Chronic Wounds

Tim Holm Jakobsen¹, Anne Servais Iversen¹, Mads Lichtenberg¹, Klaus Kirketerp-Møller², Hans Gottlieb³ and Thomas Bjarnsholt^{1,4}

¹Costerton Biofilm Center, Department of Immunology & Microbiology, Faculty of Health and Medical Sciences, University of Copenhagen, Copenhagen, Denmark.
²Copenhagen Wound Healing Center, Bispebjerg University Hospital, Copenhagen, Denmark.
³Department of Orthopedic Surgery, Herlev Hospital, Herlev, Denmark.
⁴Department of Clinical Microbiology, Rigshospitalet, Copenhagen, Denmark.

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BACKGROUND

Although the chronic wound microbiome has been well investigated, knowledge regarding factors underlying microbial colonization affecting wound progression and healing are underreported.

- Huge socioeconomic burden associated with chronic wounds
- Decreased quality of life, and a significant cause of morbidity
- Primary patient group;
 - Elderly population
 - Often cardiovascular disease and other comorbidities such as diabetes

METHODS

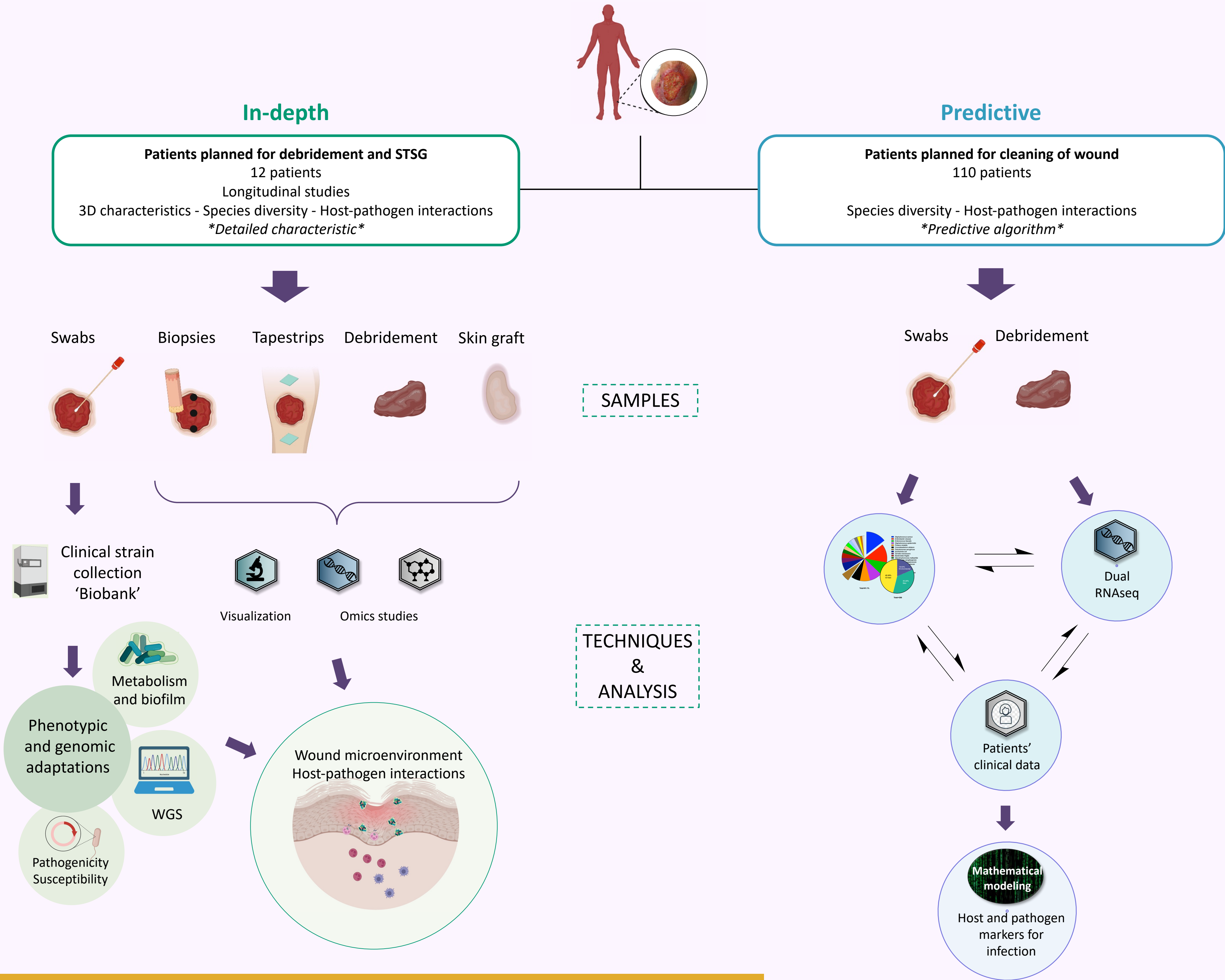
This longitudinal study investigates two groups of patients with chronic low extremity wounds.

In-depth group: 12 patients undergoing split-thickness skin graft (STSG). During surgery, we collected swabs and biopsies from the wound before and after debridement, the surrounding skin, and the donor site. The biopsies are used for visualization and omics studies to investigate host-pathogen interaction and to link phenotypic traits to genomic sequences.

Predictive group: 110 ambulatory patients. We collected swabs for bacterial identification, and debridement for dual RNA-sequencing for computational modelling of host and pathogen markers of infection.

A biobank has been established with collected clinical isolates for in vitro characterization studies and for whole genome sequencing to study adaptation.

STUDY DESIGN



OBJECTIVES

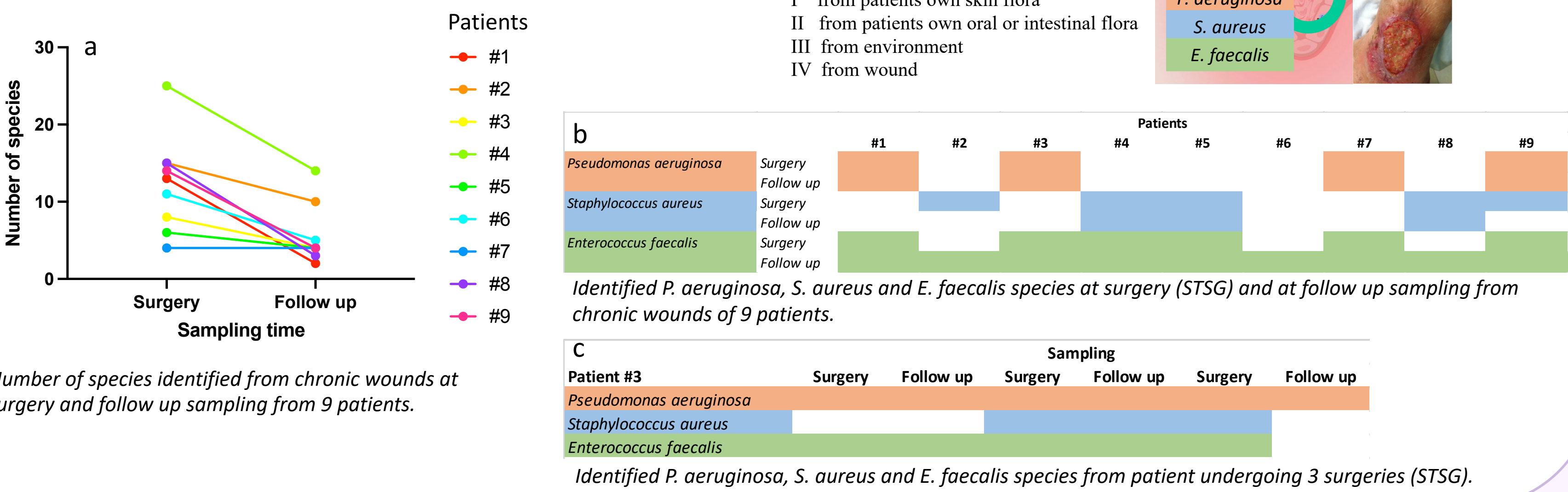
To investigate the role of bacterial biofilms in chronic wounds to address changes in the local microenvironment that potential affect treatment and healing processes

PRELIMINARY RESULTS

In-depth

Several pathogens are not removed from wounds by split-thickness skin graft surgery

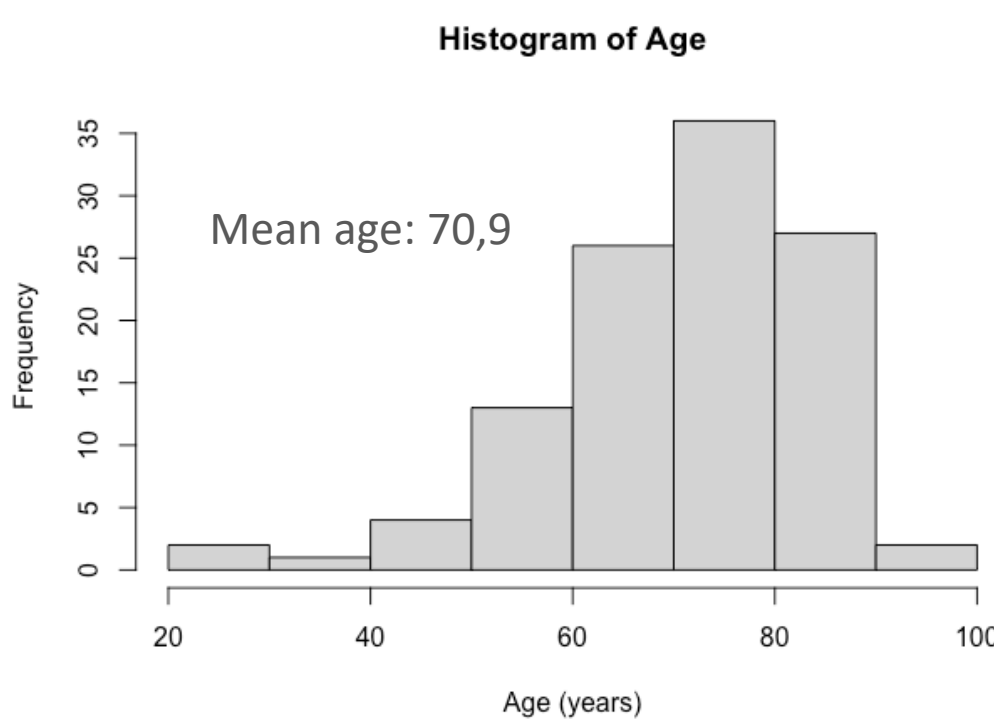
- Number of different species in wounds decrease by approx. 50% after STSG.
- P. aeruginosa*, *S. aureus* and *E. faecalis* was not removed by STSG. *E. faecalis* was present in wounds together with *P. aeruginosa*. *E. faecalis* was present in the wounds of all patients after STSG. *P. aeruginosa* was isolated from a patient after three STSGs.



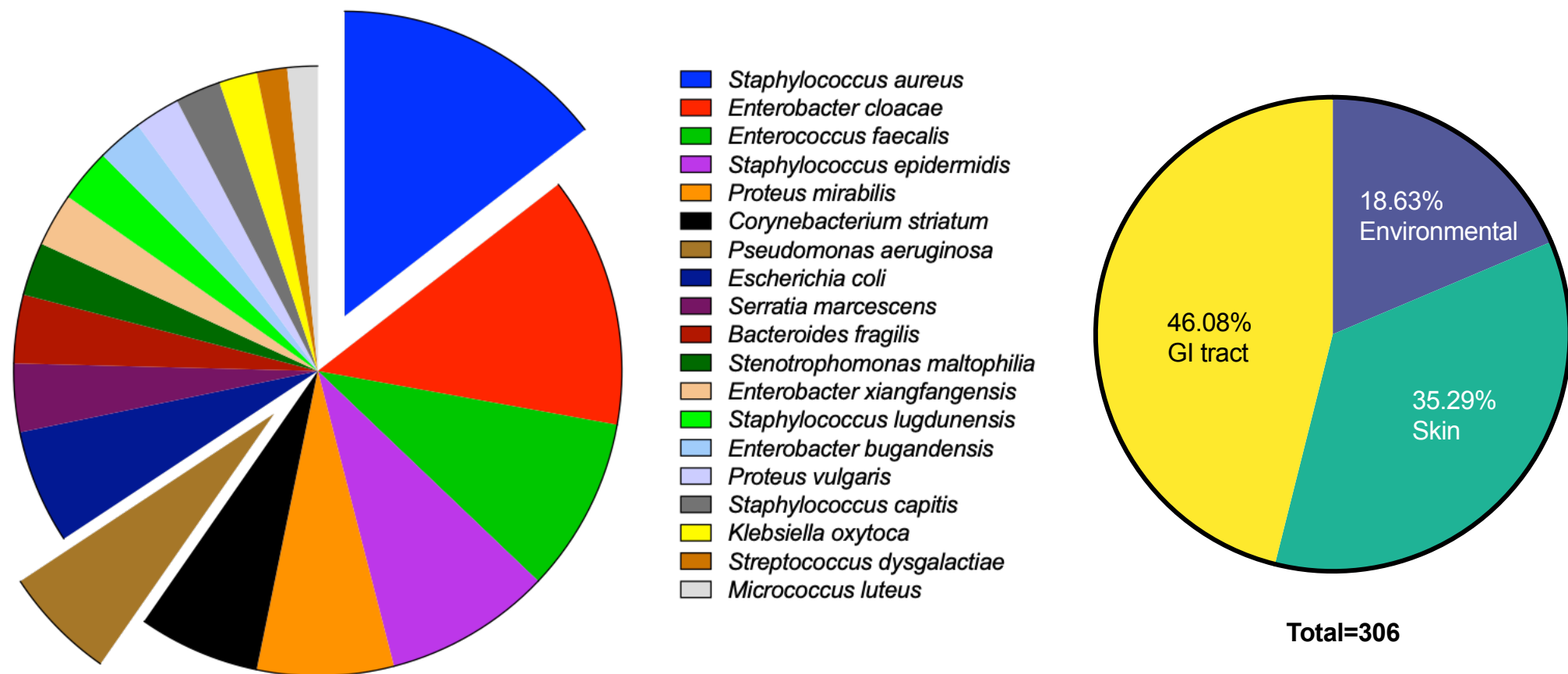
Predictive

Patient demographics

Patients	110
Female	46
Male	64
Surgical debridement	38%
Arteriosclerosis	50%
Venous insufficiency	40%
Diabetes	42%

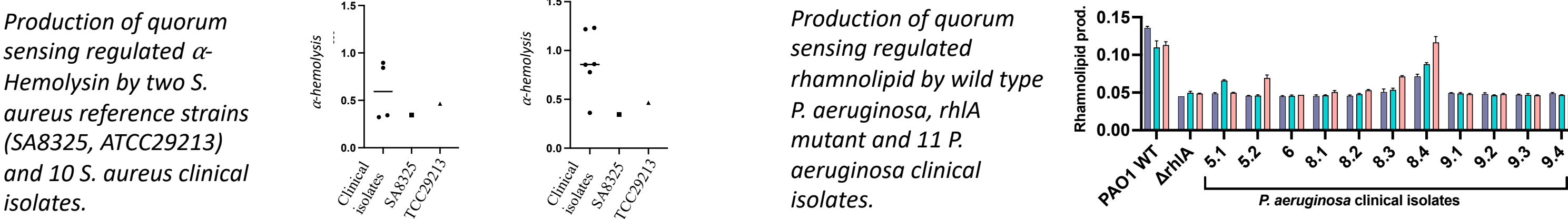


Identified bacterial species



Identified species being present in more than 1%. *S. aureus* being the most present and isolated from 1/3 of the patients. Percentage of bacteria isolated normally associated with the gastro intestinal tract, environment or skin.

Quorum sensing regulated production of virulence factors of clinical isolates are decreased



Herlev og Gentofte Hospital



Bispebjerg Hospital



Direktør Emil C. Hertz og Hustru Inger Hertz' Fond

Brødrene Hartmanns Fond



Tim Holm Jakobsen
tholm@sund.ku.dk