

Biofilm formation, its clinical impact and potential treatment

Wednesday, 28th of August, 2013

11:00 - 13:00 Registration and posterhanging - Coffee

13:00 – 13:15 Welcome to participants

KI Rektor: Anders Hamsten

13:15-13:35 Introduction to 'Biofilms', Ute Römling, KI

13:35-14:20 Introductory keynote lecture

Niels Hoiby (DK) The clinical problem - persistent infections by biofilm forming bacteria (keynote lecture)

Session: The clinical problem – persistent infections by biofilm forming microorganisms

Chairman: Anna Norrby-Teglund, Börje Åkerlund

Device-related infections

-Joint-related infections

14:20-14:50 Werner Zimmerli (CH) Clinical presentation and treatment of peri-prosthetic joint infection (PJI)

14:50-15:20 David J. Stickler (GB) Crystalline biofilms on urinary catheters: clinical complications, structure, formation and attempts at control

15:20-15:50 Coffee break, Poster viewing, part 1

-Mucosal infections

15:50-16:35 Sören Molin (DK) Evolutionary dynamics of *Pseudomonas aeruginosa* populations residing in airway biofilms in cystic fibrosis patients (keynote lecture)

Chairman: Birgitta Henriques Normark, Jan Andersson

16:35-17:05 Scott Hultgren (USA) Molecular Blueprint of UTI Pathogenesis for the Development of Novel Therapeutics

Session: Molecular basis of foreign body infections

Chairman:

17:05-17:35 Richard A. Strugnell (AU) Exquisite transcriptional control over *Klebsiella pneumoniae* biofilm formation

Short talks

17:36-17:42 Vrad Levering Active debonding of mature *Proteus mirabilis* crystalline biofilm for prevention of urinary catheter occlusion and reducing catheter-associated urinary tract infections

17:43-17:49 Moshe Shemesh Milk triggers biofilm formation of *Bacillus subtilis* via

activation of the *tapA-sipW-tasA* operon

Chairman: Marie Arsenian Henriksson, Ingemar Ernberg

Session: Biofilms and cancer

17:50-18:20 Siegfried Weiss (GE) Solid murine tumors as model system for in vivo biofilm formation

Session: Biofilm diagnostics

18:20-18:50 Jean-Marc Ghigo (FR) Identification of biofilm-associated biomarkers

Short talk

18:51-18:57 Chad Leidy (CO) *S. aureus* adapt to growth in biofilms by changing lipid compositions: Is membrane compliance an important factor during biofilm formation?

19:00-20:00 Poster viewing, part 1

from 20:00: Dinner with invited speakers at 'Stallmästaregården'

Thursday, 29th of August, 2013

Session: Biofilm – Basics – Regulation, part 1

Chairman: Ute Römling, Staffan Kjelleberg

-Biofilm formation – molecular mechanisms of a developmental process in bacteria

8:00-8:45 Richard Losick (USA) **Regulatory mechanisms governing biofilm formation in *B. subtilis*** (keynote lecture)

8:45-9:05 Gerard C.L. Wong **Psl trails guide exploration and microcolony formation in early *Pseudomonas aeruginosa* biofilms**

-Regulation of biofilm formation by cyclic di-GMP signaling, part 1

9:05-9:35 Urs Jenal (CH) **C-di-GMP-mediated regulation of *Caulobacter crescentus* development and cell cycle control: From internal program to external stimuli**

9:35-10:05 Holger Sondermann (USA) **The Ins and Outs of c-di-GMP Signaling in Bacterial Biofilm Formation**

10:05-10:50 Coffee break, Poster viewing, part 1

Chairman: Edvard Wigren

Strategies to prevent biofilm formation, part 1

from algae and other plants

10:50-11:20 Michael Givskov (DK) **Chemistry that controls biofilms and infections**

Short talk

11:21-11:27 Yinyue Deng **Cis-2-dodecenoic acid signal inhibits biofilm formation and virulence in *Pseudomonas aeruginosa* through quorum sensing and T3SS systems**

Short talk

11:28-11:34 David E. Payne **Tannic acid inhibits *Staphylococcus aureus* biofilm in an IsaA-dependent manner**

Session: Biofilm – Basics – Regulation, part 2

- Regulation of biofilm formation by cyclic di-GMP signaling, part 2

11:35-12:05 Zhao-Xun Liang (Singapore) **How does a small c-di-GMP-binding PilZ protein regulate biofilm formation?**

Regulation of biofilm formation by small RNAs

12:05-12:35 Gerhard Wagner (SE) **Bacterial sRNAs in biofilm regulation and their effects on bistable curli expression**

12:35-13:35 Lunch break – Poster viewing, part 2

Session: Biofilm – Basics – Structure

Chairman: Sun Nyunt-Wai, Magnus Rasmussen

-Visualization of biofilm formation on the single cell level

13:35-14:20Fitnat Yildiz (USA) **Structure and function of *Vibrio cholerae* biofilm Matrix**(Keynote lecture)

-Biofilm formation – Role of the extracellular matrix - polysaccharides

14:20-14:50Matthew Parsek (USA) **Polysaccharides and *Pseudomonas aeruginosa* biofilm development**

-Biofilm formation – Role of the extracellular matrix - proteins

14:50-15:20Per H. Nielsen (DK) **Amyloids – important matrix components in biofilms**

Short talks

15:21-15:27 James N. Wilking **Liquid transport facilitated by channels in *Bacillus subtilis* biofilms**

15:28-15:34 David A. Hufnagel **Disulfide bonding and redox state of the quinone pool control UPEC biofilm colony spreading and wrinkling**

15:34-16:05 Coffee break, Poster viewing, part 2

Chairman: Bernt-Eric Uhlin, Srisuda Pannanusorn

16:05-16:11 Diego O. Serra **Microarchitecture and physiological differentiation in *Escherichia coli* biofilms: spatial distribution and functions of amyloid curlifibres, cellulose and flagella**

16:12-16:18Keira Melican **Biofilm formation in perfused *in vivo* environments, and their control using organic bioelectronics devices**

-Biofilm formation in *Candida albicans*

16:19-16:49Aaron P. Mitchell (USA) **Gene regulation underlying *Candida* biofilm formation and pathogenicity**

16:50-17:50Round table discussion (coordinator: Lars Nyman)

Participants: Jan Andersson, Elda Sparrelid, David J. Stickler, Werner Zimmerli

18:15: Bus transport to the Stockholm City Hall, 'Stadtshuset'

From 19:00: Social program for all participants at the 'Stadtshuset'.

Friday, 30th of August, 2013

Chairman: Giovanna Marchini

Session: Bioinformatics of biofilm formation

8:00-8:30 Michael Galperin (USA) Using comparative genomics to understand bacterial signal transduction

Session: Raise of a novel secondary messenger

8:30-9:00 Angelika Gründling (GB) Cellular pathways that are controlled by c-di-AMP in *Staphylococcus aureus*

Session: Biofilms and the immune system

9:00-9:30 Daniel A. Portnoy (USA) c-di-AMP: an essential *Listeria* signaling molecule that triggers a type 1 interferon response

9:30-10:00 Russell E. Vance (USA) Detection of bacterial cyclic di-nucleotides by the innate immune system

10:00-10:30 Coffee break, poster viewing, part 2

Session: The resistance phenotype

Chairman: Staffan Normark

10:30-11:00 Kim Lewis (USA) Novel therapeutics against chronic infections: persistence and biofilm eradication

11:00-11:30 Susanne Häussler (GE) Antibiotic tolerance of biofilm-grown *Pseudomonas aeruginosa*

-Resistance against the immune system

11:30-12:00 Michael Otto (USA) Biofilm structuring and detachment in Staphylococci

Session: Strategies to prevent biofilm formation by NO

12:00-12:30 Staffan Kjelleberg (AU and Singapore) Nitric oxide (NO) signals for biofilm dispersal

Short talk

12:30-12:37 Nicole Frankenberg-Dinkel NO-induced biofilm dispersion in *Pseudomonas aeruginosa* mediated by a MHYT-domain coupled phosphodiesterase

12:37-13:37 Lunch break - Poster viewing, part 2

Chairman: Birgitta Agerberth, Lars Nyman

-by the immune system

13:37-14:07 Robert Hancock (CA) Broad spectrum anti-biofilm agents based on peptides of the human innate immune system

14:07-14:37 Annelie Brauner (SE) Title not available

-by artificial molecules

14:37-15:07 Fredrik Almkvist (SE), Pilicides&Curlicides; New antibacterial agents that target assembly of bacterial extracellular fibers important for biofilm formation

15:07-15:30 Coffee break, poster viewing, part 2

Chairman:

-Biofilm formation – Biophysics of biofilms

15:30-16:00 Ken Nealson (USA) The role of surface charge and electron flow in attachment and biofilm formation

-by surface design

16:00-16:30 Henk J Busscher (NL) Pitfalls in the development of antimicrobial surfaces for medical application

-Overcoming resistance through targeting persistence

16:30-16:37 Christina Stalling (USA) Dissecting mycobacterial persistence in biofilms with chemical scalpels

16:38-17:25 James J Collins (USA) Radical approaches to antibiotics and antibiotic resistance (keynote lecture)

17:25-17:45 Conference closing (Staffan Kjelleberg/Ute Römling/Hans-Gustaf Ljunggren)

Social program and dinner for invited speakers

Please note that times of talks can still be subject to change!

Saturday:

Optional offer of a social program for those who will spend the weekend in Stockholm

Boat tour in the archipelago, if the weather allows