



Tuberculosis & Machine learning: Impact on Antimicrobial resistance

Venue: The Rotunda, Domus Medica 4, University of Oslo, Norway

November 18th–20th, 2019

Monday, November 18

09:00 – 10:00 Registration, coffee and mingling

10:00 – 10:05 **Tone Tønjum**, University of Oslo (UiO), Norway:
“Welcome and introduction to the meeting”

10:05 – 10:10 **Jens Petter Berg**, UiO, Norway:
“Science and society: Infection biology, antibiotics and machine learning as prime examples”

10:10 – 10:15 **Mike Koomey**, UiO, Norway:
“Infection biology in the 21st century: Infection Biology and Antimicrobials (IBA)”

Session I – The tuberculosis clinical challenge

Chair:

10:15 – 10:45 **Kristian Tonby**, Oslo University Hospital, Norway:
“The many facets of TB – clinical cases highlighting the AMR challenge”

10:45 – 11:15 Keynote lecture – **Sébastien Gagneux**, Swiss Tropical & Public Health Institute, University of Basel, Switzerland:
“Molecular epidemiology of tuberculosis”

11:15 – 11:45 Keynote lecture – **Roland Brosch**, Institute Pasteur, France:
“The evolution of the tubercle bacilli – a story of gains and losses”

11:45 – 12:15 Coffee and cake

Session II – *Mycobacterium tuberculosis* fitness for survival under stress

Chair:

- 12:15 – 12:45 **Giulia Manina**, Institute Pasteur, France:
“Preexisting phenotypic variation predicts the fate of single mycobacterial cells during drug stress”
- 12:45 – 13:15 **John McFadden**, University of Surrey, UK:
“The role of metabolism in mycobacterial persistence”
- 13:15 – 13:45 **Elizabeth Fullam**, Wellcome Trust/Royal Society, University of Warwick, UK:
“Mycobacterium tuberculosis use of sugars”

13:45 – 14:45 Lunch

- 14:45 – 15:15 **Kristin Burns-Huang**, Weill Cornell Medical College, USA:
“Role of the mycobacterial proteostasis network in drug resistance”
- 15:15 – 15:45 **Kristine Arnvig**, University College London, UK:
“Tales of unexpected 3’ ends in *Mycobacterium tuberculosis*”
- 15:45 – 16:00 Young scientific investigator (YSI): TBA
“TBA”

16:00 – 16:30 Coffee

Session III – *Mycobacterium tuberculosis* physiology and fitness for survival

Chair:

- 16:30 – 17:15 **Jesús Blázquez**, CSIC, Spain:
“Specificity and mutagenesis bias of the mycobacterial alternative mismatch repair”
- 17:15 – 18:00 **Christopher Sassetti**, University of Massachusetts, USA:
“Genetic determinants of antibiotic efficacy in tuberculosis”

18:00 – 20:00 Poster exhibition & Tapas Dinner in the mezzanine outside the Rotunda

Tuesday, November 19

Session III – Recent progress in tuberculosis drug development

Chair:

- 10:00 – 10:45 Keynote lecture – **Slava Epstein**, Northeastern University, USA:
“New trends in TB drug development”
- 10:45 – 11:30 **Brigitte Gicquel**, Institute Pasteur, France & Nanshen Shenzeng, China:
“New drugs against *Mycobacterium tuberculosis*”
- 11:30 – 12:15 **Priscille Brodin**, Institute Pasteur, France:
“Phenotypic screenings for the identification of new drugs and new targets involved in host-mycobacteria interactions”
- 11:30 – 12:00 **Anne Margherita Dyrhol Riise**, UiO, Norway:
“Mtb vaccines and host response – therapeutic potential?”

12:15 – 13:00 Lunch

- 13:00 – 13:30 **Avinash Sonawane**, India Institute of Technology, India:
“Mechanisms of host antimicrobial peptide resistance by *Mycobacterium tuberculosis* in macrophages and bone marrow stem cells”
- 13:30 – 14:00 **Fredrik Almqvist**, Umeå University, Sweden:
“MTIs and alternative new drug targets – potential in TB treatment”
- 14:00 – 14:15 Young scientific investigator (YSI): TBA
Selected from poster abstracts

14:15 – 15:00 Coffee and cake

Session III – Recent progress in tuberculosis drug development

Chair:

- 15:00 – 15:30 **Pål Rongved**, UiO, Norway:
“Potential and pitfalls for novel TB drugs”
- 15:30 – 16:00 **Anne Margherita Dyrhol Riise**, UiO, Norway:
“Mtb vaccines and host response – therapeutic potential
- 16:00 – 17:00 **Marte Dragset**, NTNU, Norway:
“Novel mycobacterial virulence factors”
- 17:00 Tram & walk to the Astrup Fearnley Museum
- 18:00 – 22:00 Exhibition & Festive Dinner at Astrup Fearnley Museum

Wednesday, November 20

Session IV – Machine learning in infectious diseases

Chair:

- 10:00 – 10:30 Keynote lecture – **Jukka Corander**, UiO, Norway:
“Predicting bacterial phenotypes using population genomic data”
- 10:30 – 11:00 Keynote lecture – **Samaneh Kouchaki**, Univeristy of Oxford UK:
“Artificial intelligence for infectious disease”
- 11:00 – 11:30 **TBA – Holmes group**
“Machine learning in guiding clinical antibiotic therapy”

11:30 – 12:00 Coffee and cake

Session V – Machine learning in tuberculosis and antimicrobial resistance

Chair:

- 12:00 – 12:45 **Digby Warner**, Cape Town University, South Africa:
“Mapping a Mycobacterium: Applying CRISPRi, Imaging and Machine-Learning to elucidate metabolic networks and antibiotic mechanism of action”
- 12:45 – 13:15 **Derya Aytan Aktug**, Technical University of Denmark:
“Prediction of acquired antimicrobial resistance for multiple bacterial species using Neural Networks”
- 13:15 – 13:30 Young scientific investigator (YSI): TBA
“TBA”
- 13:30 – 13:45 **Tone Tønjum/Fredrik Müller**, TTA OUS/UiO, Norway:
“Closing remarks”

13:45 – 14:15 Lunch