

**Environmental Microbial Biofilms and Human Microbiomes:  
Drivers of Future Sustainability  
NTU, Singapore  
12-15 February 2017**

Day 1	Sunday, 12 February 2017 Nanyang Executive Centre, Auditorium, Level 2, NTU
Time	Session
14:00-15:00	Registration in front of Auditorium, NEC, Level 2
15:00- 16:00	Introduction  Chairman : <b>Staffan Kjelleberg</b> <b>Alan Chan</b> <b>Staffan Normark</b> <b>Staffan Kjelleberg</b> <b>Alexander Zehnder</b>
16:00 – 17:30	Keynotes Session Chairman : <b>Staffan Normark</b> <b>Philippe Sansonetti</b> Gut Microbiome in Health and Disease: From Description and Correlation to Experiments and Functions <b>Margaret McFall-Ngai</b> First Contact: Establishing Diplomatic Relations in an Animal-Bacterial Symbiosis <b>Roy Kishony</b> Emerging Drug Resistance in Microbial Communities
18:00 – 21:00	Welcome Dinner @ Orchid Hall & Alfresco Dining (Campus Clubhouse)
Day 2	Monday, 13 February 2017 Nanyang Executive Centre, Auditorium, Level 2, NTU
Theme 1 : Environmental Biofilms – Fundamentals From Microbial Models To Complex Communities	
Microbial communities dominate all ecosystems but we know relatively little about their role even in the biggest ecosystem of all - the ocean. Similarly, we have limited knowledge on bacteria-host association, such as in the human microbiome. Interactions among closely associated microbes are significantly more complex than we envisioned and involve a web of signaling compounds, antibiotics and viruses resulting in fast evolving heterogeneous communities, continuously being selected for by a variety of ecological forces. Trying to understand experimental evolution of biofilms/microbiomes requires the use of novel experimental tools in robust engineering approaches along with the development of computational tools.	
9:30 – 10:30	Session Chairman : <b>Alexander Zehnder</b> <b>Peer Bork</b> Microbiome Analysis of the Human Gut and the Ocean <b>Linda Wegley</b> Predicting Reef Futures via Biological Feedbacks of Holobionts and Biophysical Characters of Interaction Zones <b>Yehuda Cohen</b> Microbial Biofilms – Dynamic Evolution of Heterogeneous Communities Guided by Ecological Selection
10:30 – 11:00	Coffee Break

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11:00 – 13:00	<p><b>Roy Kishony</b> Understanding, Predicting and Manipulating the Evolution of Antibiotic Resistance</p> <p><b>Mark Ellisman</b> Toward Making the Invisible and Complicated Understandable: Microscopy Across Scales and Modalities</p> <p>Discussion—Leader : <b>Yehuda Cohen</b></p>
13:00 – 14:00	Lunch Break
<b>Theme 2 : Molecular Microbial Ecology to Macro Ecology and Environmental Engineering</b>	
<p>Bacteria being few cubic microns in size are driven by the ecology of life at the microscale, yet their communal activity are pivotal for all macro ecosystems both terrestrial and marine. While the experimental ecology and ecological theories are well established in both plant and animal communities, we wish to understand how this knowledge informs on microbial ecology and how an improved understanding of processes in microbial communities explains ecosystem health. These questions are also of practical importance for harnessing microbial communities in highly important environmental engineering such as water purification, wastewater bioremediation and for maintaining healthy environments.</p>	
14:00 – 15:20	<p>Session Chairman : <b>Alexander Zehnder</b></p> <p><b>David Wardle</b> The Role of Soil Microbiota in Driving Aboveground-Belowground Linkages</p> <p><b>Tom Ian Battin</b> Stream Biofilm Ecology beyond Sequences</p> <p><b>Peter Steinberg</b> On Integrating Microbial Biofilms into Coastal Ecology, Management and Sustainability</p> <p><b>Kenneth Nealson</b> Extracellular Electron Transfer (EET): Opening New Windows of Metabolic Opportunity</p>
15:20 – 15:50	Coffee Break
15:50 – 17:50	<p><b>Marilyn J. Roossinck</b> Viruses in the Phytobiome: Abundance and Ecological Roles</p> <p><b>Ehud Banin</b> Biofouling – Can We Do Something About it ?</p> <p><b>Stefan Wuertz</b> From Ecological Theory to Microbial Community Assembly in Bioreactors and Process Performance</p> <p>Discussion—Leader : <b>Tom Ian Battin</b></p>
18:15 – till end	Dinner & Tour for speakers & organizing committee

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<b>Day 3</b>	Tuesday, 14 February 2017 Nanyang Executive Centre, Auditorium, NTU
<b>Theme 3 : Human Microbiome New Dimensions in Medical Microbiology</b>	
<p>Recently, human microbiome science has delivered new insights encompassing the huge microbial diversity revealed among individuals as well as among anatomic sites in a given individual.</p> <p>Following the initial inescapable descriptive and correlative metagenomic studies, we now seek to consolidate information acquired by functional metagenomics to inform us on the actual role of microbiomes in human physiology, and the impact of altered microbiomes that have undergone changes in microbial composition and reduction in richness and diversity in pathology. Both bona fide in vitro and in vivo models as well as clinical studies in which the microbiome is altered are required.</p>	
8:30 – 10:00	<p>Session Chairman : <b>Staffan Normark</b></p> <p><b>David A Relman</b> Human Microbial Ecology in Health and Disease</p> <p><b>Sven Pettersson</b> Use of Germ Free Mice as a Model System to Understand the Holobiont</p> <p><b>Martin J. Blaser</b> Perturbing the Early Life Microbiota: Immediate Effects and Long-Term Consequences</p> <p><b>Liping Zhao</b> Gut Microbiome: A New Target for Managing Human Health</p>
10:00 – 10:30	Coffee Break
10:30 – 12:00	<p><b>Gary D. Wu</b> Diet, the Gut Microbiome, and its Metabolome in Inflammatory Bowel Disease: Therapeutic Opportunities</p> <p><b>Ting Zhu</b> Inhalable Microorganisms in Beijing's PM Pollutants</p> <p>Discussion—Leader : <b>Philippe Sansonetti</b></p>
12:00 – 13:30	Lunch Break
<b>Theme 4 : Interrelation of Environmental and Human Sustainability</b>	
<p>Human (animal) health, at all scales from personal to societal, is dependent on the emergent properties of ecological communities dominated by microorganisms.</p> <p>Community assembly, either as part of our bodies, or in our surrounding environments, is thus central to sustainability.</p> <p>How communities assemble is influenced by intrinsic properties of their member species, but also by extrinsic factors such as sources of dispersing populations and dynamics of the physico-chemical environment.</p> <p>If we understand which environmental dimensions most strongly interact with community assembly we can improve strategies to mitigate anthropogenic influence on sustainability.</p>	

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Theme 4 : Interrelation of Environmental and Human Sustainability	
13:30 – 15:00	<p>Session Chairman : <b>Staffan Kjelleberg</b>  <b>Margaret McFall-Ngai</b>                      Establishment and Maintenance of Coevolved Host-Microbe Partnerships: Insights from Simple Model Systems  <b>Marilou Sison-Mangus</b>                      Microbiome Influence on the Production of Amnesia-Causing Toxin, Domoic Acid, in the Harmful Bloom-Forming Marine Diatom Pseudo-nitzschia  <b>Sandra Mclellan</b>                      The Microbiome and Ecological Signatures of Urban Water Systems</p>
15:00 – 15:30	Coffee Break
15:30-17:30	<p><b>Paul Wilmes</b>                      From Gut to Sludge: How to Sustainably Manage Microbial Communities in Future  <b>Andrew J. Holmes</b>                      Diversity, Co-operation and Limiting Nutrients in the Host-Microbiome Dynamics</p> <p>Discussion—Leader : <b>Andrew J. Holmes</b></p>
17:30– 18:00	<p>Summary Session  <b>Alexander Zehnder</b> : Sustainability Revisited  <b>Martin Delahunty and Joe Bennett</b> : Overview on <i>npj Biofilms and Microbiomes</i></p>
18:30 – till end	Dinner @ Function Hall 1, Nanyang Executive Centre, Level 3
<b>Day 4</b>	<b>Wednesday, 15 February 2017</b> <b>Nanyang Executive Centre, Lecture Room 4, Level 3, NTU</b>
8:30– 18:00	<p>Closed brainstorming day</p> <p><b>Novel Aspects In Future Sustainability</b>  <i>(for speakers &amp; organizing committee)</i>                      Discussion Leaders:                      Theme 1: <b>Yehuda Cohen</b>                      Theme 2: <b>Tom Battin</b>                      Theme 3: <b>Philippe Sansonetti</b>                      Theme 4: <b>Andrew J. Holmes</b></p>

ORGANIZERS

