The Microbial Stress 2020 was held online from 16 to 18 November. That year, the program included internationally-known experts in the field who gave talks on topics such as second messenger signalling in bacteria, stress sensing, stress and antibiotic resistance, biofilms, organic acid stress in yeasts, metal ion stress, and yeast transcriptional response to stress, among others. The meeting featured keynote lectures from Prof. James Bardwell from the University of Michigan, USA, on chaperone folding under stress conditions, and from Prof. Regine Hengge from Hermann von Helmholtz University, Berlin, Germany, on second messenger signalling. This interdisciplinary meeting served as an ideal forum for exchanging ideas with leading scientists and forming new collaborations.

The topics included:

- Stress at the Systems and Structural Level
- Signalling, intracellular and population responses under stress
- Antibiotic stress and persistence
- Biotic and abiotic stress as evolutionary drivers
- Industrial applications of low pH stress on microbial bio-based production

Final Programme – topics and speakers

5th Conference "Microbial Stress: From Systems to Molecules and Back"

16 – 18 November, 2020

Monday, November 16th 2020

14.00 – 14.10	Organizers welcome address
Session I - Stress at the Systems and Structural Level **SPONSORED BY EPPENDORF** Chair: Linda Kenney (USA)/ Conor O'Byrne (Ireland)	
14.10 - 14.50	**Opening Keynote Lecture** **James Bardwell - University of Michigan, Howard Hughes Medical Institute, Ann Arbor, USA** *Chaperone mediated folding by the stress induced chaperone Spy*
14.50 – 15.00	Q & A
15.00 - 15.15	**Torkel Loman - University of Cambridge, UK** *Noisy activation, pulsing or switching? Mapping the possible behaviours of alternative*
15.15 - 15.30	**Changhan Lee – University of Michigan, HHMI - USA** *A Metabolite Binding Protein Moonlights as a Bile-Responsive Chaperone*
15.30 - 15.45	**Hana Sychrová - Institute of Physiology, Czech Academy of Sciences, Czech Republic** *Active Trk1 potassium-uptake system is crucial for yeast resistance to acidic stress*
15.45– 15.55	Q & A
15.55 - 16.10	*Coffee break*
16.10 - 16.40	Invited Lecture **Jan Pané-Farré - Philipps-University Marburg, Germany** *Structure and function of the Stressosome signalling hub*
16.40 – 16.45	Q & A
16.45 – 17.00	**Sophie Vazulka - University of Natural Resources and Life Sciences, Vienna, Austria** *Aberrant ribosome stalling upon recombinant protein production:* E. coli *host strains activate different quality control systems*
17.00 – 17.15	**Buu Minh Tran - University of Groningen, Groningen, the Netherlands** *Localization and diffusion of the stressosome in* Listeria monocytogenes
17.15 – 17.30	**Hilal Taymaz-Nikerel - Istanbul Bilgi University, Turkey** *Resolving stress response to unveil the genome-wide effects of drugs*
17.30 – 17.40	VIDEO-PRESENTATION by EPPENDORF:Presenter, Affiliation, Title: tbc
17.40 – 17.50	Q & A
17.50 - 18.40	Virtual Poster presentations

Tuesday, November 17th 2020

Session II - Signaling, intracellular and population responses under stress Chairs: Paola Branduardi (Italy)/Matthias Steiger (Austria)	
09.00 - 09.30	Invited Lecture **Jörg Stülke - Georg-August-Universität Göttingen, Germany** *Recent advances and current trends in nucleotide second messenger signalling in bacteria*
09.30 – 09.35	Q & A

09.35 – 09.50	**Chiara Guidi - Ghent University, Belgium** *Evaluating inner-membrane stress in* E. coli *for overexpression of functional membrane proteins*
09.50 – 10.05	**Duarte Guerriero - National University of Ireland, Galway, Ireland** *The stressosome of* Listeria monocytogenes *plays a critical role in low pH sensing, adaptive acid tolerance and SigB regulation*
10.05 – 10.20	**Alfred Fernández-Castané - University of Birmingham, UK** *Physiological responses to changing environmental conditions of* Magnetospirillum gryphiswaldense MSR-1 *and impact on magnetosome production*
10.20 – 10.30	Q & A
10.30 – 10.45	*Coffee break*
10.45 - 11.15	Invited Lecture **Nicola Stanley-Wall - University of Dundee, UK** *Understanding the mechanisms of biofilm formation by* Bacillus subtilis
11.15 – 11.20	Q & A
11.20 – 11.35	**Ilana Kolodkin-Gal - Weizmann Institute of Science , Israel** *Function Beyond Structure: The Functional Amyloid TasA as a Developmental Cue*
11.35 - 11.50	**Serena Rinaldo – Sapienza University of Rome, Italy** *Sensing L-Arginine In* Pseudomonas aeruginosa *links energy metabolism and c-di-GMP Levels*
11.50 – 12.05	**Carmit Ziv – Agricultural Research Organization (ARO), Israel** *Stress response of postharvest phytopathogenic fungi in cold storage*
12.05 – 12.15	Q & A
12.15 - 14.00	Lunch
Session III - Antibiotic stress and persistence Chairs: Daniela De Biase (Italy)/John Morrissey (Ireland)	
14.00 - 14.30	Invited Lecture **Oscar Kuipers - University of Groningen, Netherlands** *Preadaptation of* Bacillus subtilis *to mild osmostress contributes to increased antibiotic resistance*
14.30 - 14.35	Q & A
14.35 - 14.50	**David Calderon Franco - Delft University of Technology, The Netherlands** *Free-floating extracellular DNA: systematic profiling of mobile genetic elements and antibiotic resistance from wastewater*
14.50 – 15.05	**Fatemah Alatar - University of Birmingham, UK** *Use of high-density transposon libraries to compare the effects of acetic acid stress on different strains of* E. coli
15.05 – 15.20	**Mark Zurbruegg - University of Edinburgh, UK** *Is expression of trehalose in Escherichia coli set by the growth rate?*
15.20 – 15.30	Q & A
15.30 - 15.45	*Coffee break*
15.45 - 16.15	Invited Lecture **Bram Van den Bergh – KU Leuven, Belgium** *Internal pH homeostasis and its involvement in evolution towards high antibiotic persistence*
16.15 – 16.20	Q & A
16.20 – 16.35	**Valeria Ellena – ACIB GmbH, Vienna, Austria** *Sclerotia formed by citric acid producing strains of* Aspergillus niger*: induction and morphological analysis*

16.35 – 16.50	**Maria de Lourdes Tovilla Coutino - UMR Sayfood, AgroParisTech, INRAE, University Paris-Saclay, Thiverval-Grignon, France** *Bacterial cell adaptation to environmental stress during fermentation improves cryo- and drying resistance: A focus on membrane properties*
16.50 – 17.00	Q & A
17.00 - 18.00	Virtual Poster presentations

Wednesday, November 18th 2020

Session IV - Biotic and abiotic stress as evolutionary drivers **SPONSORED BY MICROBIOLOGY SOCIETY (UK and Ireland)** Chairs: Rute Neves (Denmark)/Mustafa Turker (Turkey)	
09.00 - 09.30	Invited Lecture **Verena Siewers – Chalmers University of Technology, Sweden** *Stress-induced expression is enriched for evolutionarily young genes in diverse budding yeasts*
09.30 – 09.35	Q&A
09.35 – 09.50	**Martina Cappelletti - University of Bologna, Italy** *Integrating omics analyses to unravel* Rhodococcus *stress response to toxic metal(loid)s*
09.50 – 10.05	**Marta Acin-Albiac - Free University of Bolzano, Italy** *How* Lactobacillus plantarum *shapes its metabolism under contrasting environmental stressors.*
10.05 – 10.20	**Amelie Girardeau - UMR SayFood, AgrosParisTech, INRAE, University Paris-Saclay, Thiverval-Grignon, France** *Effects of pH stress during growth on the physiological, biophysical and biochemical properties of* Carnobacterium maltaromaticum *cells*
10.20 – 10.35	**Z. Patek Cakar - Istanbul Technical University, Turkey** *Genomic and transcriptomic analyses of a caffeine-hyperresistant* Saccharomyces cerevisiae *strain obtained by evolutionary engineering*
10.30 – 10.45	Q&A
10.45 - 11.00	*Coffee break*
11.00 - 11.30	Invited Lecture **John Morrissey – University College Cork, Ireland** *Physiological response to temperature shock in yeast: new insights from an integrated analysis of transcription and translation*
11.30 – 11.35	Q&A
11.35 – 11.50	**Marianne Ilbert - Aix-Marseille Université, France** Copper stress induces protein aggregation and triggers molecular chaperones
11.50 – 12.05	**Heghine Gevorgyan - Yerevan State University, Armenia** *pH homeostasis in* Escherichia coli *at acidic pH during fermentation of glucose and glycerol in the presence of external formate*
12.05 – 12.20	**Beatriz Martínez - Instituto de Productos Lácteos de Asturias (IPLA-CSIC), Spain** *Exploiting the lactococcal cell envelope stress response for proficient dairy starters*
12.20 – 12.30	*Q&A*
12.30 - 14.00	Lunch
EFB-COST ACTION CA18113 "EuroMicropH" co-organized **Session V - Industrial applications of low pH stress on microbial bio-based production** **SPONSORED BY m2p-labs** Chairs: Zeynep Cetecioglu (Sweden)/Peter Lund (UK)	
14.00 - 14.30	Invited Lecture

	Paola Branduardi – University of Milano Bicocca, Italy *Yeasts coping with organic acids: lessons and potential solutions*
14.30 - 14.40	**Jana Sedlakova – Kadukova- Pavol Jozef Safarik University in Kosice, Slovakia** *Perspectives and limitations in e-waste bioleaching*
14.40 – 14.50	**Merve Atasoy, KTH, Sweden** *Mixed culture fermentation for volatile fatty acids production from waste-streams under acidogenic conditions*
14.50 – 15.00	**Mustafa Turker – Pakmaya, Turkey** *Low pH in food and industrial biotechnology: opportunities and potential Applications*
15.00 – 15. 10	**Sebastian Blum - m2p-labs Microbioreactors** *High-Throughput Microfermentations*
15.10 - 15.25	*Coffee break*
15.25 – 15.35	**Lucian Staicu – University of Warsaw, Poland** *Metal stress - biomineral remedy*
15.35 – 15.45	**Adam Cenian – Polish Academy of Science, Poland** *Influence of acidic stress on biohydrogen production from biowaste in dark fermentation*
15.45 – 17.00	*General Discussion of COST CA18113 Working Group 4 and delegate networking*
17.10 – 17.50	**Closing Lecture - EMBO Keynote Lecture** **Regine Hengge – Humboldt University Berlin, Germany** *Linking bacterial growth, survival and multicellularity with second messengers as triggers and drivers*
17.50 – 18:20	*Q&A* Closing remarks and Poster prize awards

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