

Scientific Program

Monday, September 2

14:00- Registration

16:00-16:15 Opening Ceremony Room A

16:15-17:45 Opening Session Room A

Chair: Tairo Oshima

16:15- OL1 **Jennifer Littlechild**, University of Exeter, UK
The Importance of Thermophiles for Novel Enzyme Discovery

Chair: Haruyuki Atomi

16:45- OL2 **Michael W. Adams**, University of Georgia, USA
Engineering Thermophiles to Make Useful Products

Chair: Yoshizumi Ishino

17:15- OL3 **Patrick Forterre**, Institut Pasteur/Université Paris-Saclay, Orsay, France
Archaea, Viruses and the Origin of Eukaryotes

18:00-19:30 Welcome Reception

Tuesday, September 3

8:30- Registration

9:00-10:15 **Keynote Lectures** Room A

Chair: Takuro Nunoura

9:00- KL1 **Mary A. Voytek**, NASA Headquarters, USA/Tokyo Institute of Technology, Japan
What Do Thermophiles Tell Us about the Origin, Evolution and Distribution of Life in the Universe

9:25- KL2 **Masahiro Yamamoto**, Japan Agency for Marine-Earth Science and Technology, Japan
Electric Discharge Phenomenon and Electrotrophic Ecosystem in Deep-sea Hydrothermal Field

9:50- KL3 **Martina Preiner**, University of Düsseldorf, Germany
A Geochemical Route to Primordial Carbon and Energy Metabolism?

10:15-10:45 Coffee break

10:45-12:00 **Keynote Lectures** Room A

Chair: Michael W. Adams

10:45 - KL4 **Hisashi Hemmi**, Nagoya University, Japan
Discovery of A "Fourth" Mevalonate Pathway from the Hyperthermophilic Archaeon *Aeropyrum pernix*

11:10- KL5 **Makoto Nishiyama**, The University of Tokyo, Japan
Regulatory Roles of Catalytically-inactive Enzyme Homologs in Metabolism of *Thermus thermophilus*

11:35- KL6 **Peter Schönheit**, Christian-Albrechts Universität Kiel, Germany
New Views on an Old Enzyme: Allosteric Regulation and Evolution of Archaeal Pyruvate Kinases

12:00-12:15 Group Photo

12:15-13:20 Lunch

13:20-15:08 Oral Session 1A **Room A**

Chairs: Jaeho Cha, Haruyuki Atomi

- 13:20- O1 **Arnold J.M. Driessen**, University of Groningen, The Netherlands
Structural and Functional Analysis of Archaeal Ether Phospholipid Biosynthesis
- 13:38- O2 **Shinsuke Fujiwara**, Kwansai-Gakuin University, Japan
Effect of Branched-chain Polyamine on DNA Structure and Gene Regulation in Hyperthermophile
- 13:56- O3 **Mohamed Jebbar**, University of Brest, France
The Influence of Hydrogenases and the SurR Regulator on the Adaptation to High Hydrostatic Pressures in *Thermococcus barophilus* MP
- 14:14- O4 **Toshihisa Ohshima**, Osaka Institute of Technology, Japan
Artificially Created Thermostable NADP-dependent D-amino Acid Dehydrogenases: Creation and Application
- 14:32- O5 **Mirko Basen**, Johann Wolfgang Goethe University/University of Rostock, Germany
The Hydrogen-dependent Carbon Dioxide Reductase (HDCR) is Required for Growth of the Thermophilic Bacterium *Thermoanaerobacter Kivui* on Single Substrates
- 14:50- O6 **Bradley Lusk**, Science the Earth, USA
Thermophiles; or, the Modern Prometheus: The Importance of Extreme Microorganisms for Understanding and Applying Extracellular Electron Transfer

13:20-15:08 Oral Session 1B **Room B**

Chairs: Dong-Woo Lee, Frank Robb

- 13:20- O7 **Kohsuke Honda**, Osaka University, Japan
Cysteine Production Through an *In Vitro* Synthetic Metabolic Pathway Consisting of Thermophilic Enzymes
- 13:38- O8 **Ying Zhang**, University of Nottingham, UK
Metabolic Engineering of *Geobacillus thermoglucosidasius* for the Production of Chemicals and Fuels
- 13:56- O9 **Lili Sheng**, University of Nottingham, UK
Metabolic Engineering of *Geobacillus Thermoglucosidasius* for 2,3-Butanediol Production at Elevated Temperature
- 14:14- O10 **Rosa Merlo**, National Research Council of Italy/University of Naples, Italy
From Hot Sources to Biotechnological Processes: A Novel Tool for an *In Vivo* Enzyme Labelling and Immobilization
- 14:32- O11 **Yoshitaka Bessho**, Academia Sinica, Taiwan/ RIKEN SPring-8 Center, Japan
XFEL Coherent Diffractive Bio-Imaging at SACLA/SPring-8
- 14:50- O12 **Gaëlle Hogrel**, Institut de Biologie Structurale/Ifrémer, France
PBP11, a Novel Proteasome Binding Protein Bridging Protein and RNA Quality Control Systems in Thermococcales

15:10-16:40 Poster Session 1 (with coffee) **Poster Hall**

Poster presentation: Odd Numbers:

16:40-18:28 **Oral Session 2A** Room A

Chairs: Qunxin She, Toshiaki Fukui

- 16:40- O13 **Xu Peng**, University of Copenhagen, Denmark
Viral anti-CRISPR Proteins Inhibit CRISPR Immunity in the Hyperthermophilic Archaeon *Sulfolobus*
- 16:58- O14 **Kevin Pfeifer**, University of Vienna/University of Natural Resources and Life Sciences, Austria
CRISPR-mediated Silencing of *slaB* Reveals Vital Roles of the S-layer in Cell Division and Virus Infection in the Hyperthermophilic Archaeon *Sulfolobus solfataricus*
- 17:16- O15 **Tomoyuki Numata**, Kyushu University/National Institute of Advanced Industrial Science and Technology, Japan
Crystal Structure of the Type III CRISPR-Cas Cmr Complex Bound to a Target Analog
- 17:34- O16 **Ryan Catchpole**, Institut Pasteur/CNRS, France
Conjugative Plasmid Mobilisation Allows Genetic Modification of Previously Untransformable Archaea
- 17:52- O17 **Miyako Shiraishi**, Osaka University/Kyushu University, Japan
Endonuclease Q acts on various mutagenic bases in hyperthermophilic archaea
- 18:10- O18 **Toshihiro Itoh**, Kitasato Research Center for Environmental Science, Japan
The Earth Looks Like "A High Dimensional Environmental Giant Life"

16:40-18:28 **Oral Session 2B** Room B

Chairs: Mirko Basen, Kohsuke Honda

- 16:40- O19 **Virginija Cvirkaite-Krupovic**, Institut Pasteur, France
The Indestructible Pili of *Sulfolobus islandicus*
- 16:58- O20 **Gabriel M. Rubinstein**, University of Georgia, USA
Caldicellulosiruptor bescii Utilizes a New Class of Glyceraldehyde-3-Phosphate Ferredoxin Oxidoreductase in an Alternative and Parallel Glycolytic Pathway
- 17:16- O21 **Takahiro Shimosaka**, Kyoto University/Japan Society for the Promotion of Science, Japan
Identification and Characterization of a Novel Archaeal Dephospho-CoA Kinase in *Thermococcus kodakarensis*
- 17:34- O22 **Helge M. Dietrich**, Johann Wolfgang Goethe University, Germany
Unravelling the Function of the Hydrogen-Dependent CO₂-Reductase – Homologous Overproduction and Mutagenesis Bring Light into the Dark
- 17:52- O23 **Tamotsu Kanai**, Kyoto University, Japan
Genetic Characterization of Multiple Chitinases of the Hyperthermophilic Archaeon, *Pyrococcus chitonophagus*
- 18:10- O24 **Joydeep Chakraborty**, The University of Tokyo, Japan
Identification of a Novel Lignoaromatic Degradation Pathway in *Thermus oshimai* JL-2 and its Evolutionary Implication

Wednesday, September 4

9:00-10:15 **Keynote Lectures** Room A

Chair: Zvi Kelman

9:00- KL7 **Steve D. Bell**, Indiana University, USA
Chromosome Archae-tecture

9:25- KL8 **Andrew F. Gardner**, New England Biolabs, Inc., USA
A SMRT Way to Map Genome-wide DNA Replication and Repair in Thermophiles

9:50- KL9 **Hannu Myllykallio**, CNRS-INSERM-Ecole Polytechnique, France
Mechanisms of High Fidelity DNA Replication and Recombination in Hyperthermophilic Archaea

10:15-10:45 Coffee break

10:45-12:00 **Keynote Lectures** Room A

Chair: Mart Krupovic

10:45- KL10 **Qunxin She**, Shandong University, China/University of Copenhagen, Denmark
Molecular Mechanism of Nucleic Acids Cleavage by a *Sulfolobus* III-B CRISPR-Cas System

11:10- KL11 **Michael Terns**, University of Georgia, USA
DNA Uptake into CRISPR Loci of *Pyrococcus furiosus*

11:35- KL12 **Kira S. Makarova**, National Institute of Health, USA
Prediction and Comparative Genomic Analysis of Biological Conflicts Systems in Thermophilic Archaea

12:30- **Excursion with Lunch**

Thursday, September 5

9:00-10:15 **Keynote Lectures** Room A

Chair: Mohamed Jebbar

- 9:00- KL13 **Ilya Kublanov**, FRC Biotechnology RAS , Russia
Hot in Cold: Who is Living in Permafrost-located Hydrothermal Springs
- 9:25- KL14 **Don Cowan**, University of Pretoria, South Africa
Functional Metagenomics of Hot Hyperarid Desert Soils
- 9:50- KL15 **Xiang Xiao**, Shanghai Jiao Tong University, China
Increased Mutation Rate and Reduced Selection Efficiency Drive Evolution of a Dominant Anaerobic Hyperthermophile at Deep Sea Hydrothermal Vents

10:15-10:45 Coffee break

10:45-12:00 **Keynote Lectures** Room A

Chair: Mircea Podar

- 10:45- KL16 **Nils-Kåre Birkeland**, University of Bergen, Norway
Allopatric Evolution among Thermoacidophilic Verrucomicrobial Methanotrophs from Globally Distributed Terrestrial Hot Springs
- 11:10- KL17 **Mart Krupovic**, Institut Pasteur, France
Secrets of Archaeal Viruses in the Acidic Hot Springs of Beppu, Japan
- 11:35- KL18 **Tomohiro Mochizuki**, Tokyo Institute of Technology, Japan
Yet Unsaturating Limit of Archaeal Viruses – Similarities and Dissimilarities with Bacteria

12:00-12:10 Break

12:10-12:50 **Special Lecture** Room A

Chair: Yoshizumi Ishino

- 12:10- SL **Tairo Oshima**, Kyowa-kako.Co., Japan
Why *Thermus thermophilus* is not Boiled in Hot Mediums: A Brief Summary of 50 Years Biochemical Studies

12:50-13:00 Break

13:00-14:15 **Keynote Lectures** Room A

Chair: Li Huang

- 13:00- KL19 **Yulong Shen**, Shandong University, China
Functional Analysis of DNA Repair Endonucleases Hjc/Hje/EndoMS in *Sulfolobus islandicus* REY15A
- 13:25- KL20 **Didier Flament**, Ifremer, France
New Insights into the Molecular Mechanism of DNA Recombination in Hyperthermophilic Archaea
- 13:50- KL21 **Frank Robb**, Institute of Marine and Environmental Technology/University of Maryland, USA
An Ancestral Chaperonin from the Thermophilic Thaumarchaeote *Nitrosocaldus cavascurensis*

14:15-15:45 **Poster Session 2 (with coffee)** Poster Hall

Poster presentation: Even Numbers:

15:45-17:33 **Oral Session 3A** Room A

Chairs: Lori Kelman, Tomohiro Mochizuki

- 15:45- O25 **Takayuki Ohira**, The University of Tokyo, Japan
Thermophilic Archaeal tRNAs are Stabilized by *N*⁴-acetylcytidine Modification
- 16:03- O26 **Akira Hirata**, Ehime University, Japan
Analysis of Distinct Modified Nucleosides in tRNA from the Hyperthermophilic Archaeon *Thermococcus kodakarensis* Provides Insight into the Requirement of Specific tRNA Modifications and their Responsible Genes for Survival at High Temperatures
- 16:21- O27 **Toshiaki Fukui**, Tokyo Institute of Technology, Japan
Identification of Genes Related to Hyperthermotolerance or Sugar Metabolisms in Hyperthermophilic Archaeon by Random Mutagenesis
- 16:39- O28 **Richard D. Morgan**, New England Biolabs, USA
Identifying Subtle Genetic Variation between Individuals within a Hot Spring Metagenome Community using High-Accuracy Long-Read PacBio Sequencing
- 16:57- O29 **Katsumi Doi**, Kyushu University, Japan
Molecular, Physiological and Phylogenetic Traits of Hyperthermophilic Filamentous Phage ϕ OH3
- 17:15- O30 **Sarah Thiroux**, Institut Universitaire Européen de la Mer, France
Archaeal Viruses of Deep Sea Hydrothermal Vents: *Methanocaldococcus fervens* virus 1, The First Head-Tailed Virus Isolated from an Hyperthermophilic Archaeon

15:45-17:33 **Oral Session 3B** Room B

Chairs: Karine Alain, Han-Seung Lee

- 15:45- O31 **Shingo Kato**, RIKEN BioResource Research Center, Japan
Isolation of a Sulfur- and Iron-reducing Thermoacidophilic Thaumarchaeote
- 16:03- O32 **Michael Melcher**, University of Vienna, Austria
Isolation and Physiological Characterization of *Nitrosocaldus cavascurensis* an Extremely Thermophilic Thaumarchaeon
- 16:21- O33 **Masao Inoue**, Kyoto University, Japan
Redox-balancing in Carbon Monoxide-utilization of a Thermophilic, Hydrogenogenic Carboxydrotroph *Calderihabitans maritimus* KKC1 Revealed by a Comparative Transcriptomic Study
- 16:39- O34 **Peter N. Golyshin**, Bangor University, UK
Activity-Based Bioprospecting for Hydrolases in Enrichment Cultures from Thermal Vents of Ischia Island (Italy)
- 16:57- O35 **Muhammad Feisal Jatnika**, Kwansai-Gakuin University, Japan
Efficient Agmatine Production by Thermostable Enzyme in the Marine Diatom
- 17:15- O36 **Ram Karan**, King Abdullah University of Science and Technology, Saudi Arabia
Halo-thermophilic Brine Pool Extremozymes from Single Amplified Genomes

19:00-21:00 **Banquet**

Friday, September 6

- 9:00-10:15 **Keynote Lectures** Room A
Chair: Arnold J.M. Driessen
- 9:00- KL22 **Sung Gyun Kang**, Korea Institute of Ocean Science and Technology/University of Science and Technology, Korea
One-carbon Substrate-based Biohydrogen Production by a Hyperthermophilic Archaeon, *Thermococcus onnurineus* NA1
- 9:25- KL23 **Andrea Strazzulli**, University of Naples Federico II, Italy
Novel Hyperstable Carbohydrate-Active Enzymes from Geothermal Environments for Biotechnological Applications
- 9:50- KL24 **Yan Feng**, Shanghai Jiao Tong University, China
Thermophilic Argonaute Protein for Highly Sensitive SNV Enrichment and Detection
- 10:15-10:45 Coffee break
- 10:45-12:25 **Keynote Lectures** Room A
Chair: Steve D. Bell
- 10:45- KL25 **Finn Werner**, University College London, UK
Molecular Mechanisms and Global Regulation of Transcription in Archaea
- 11:10- KL26 **Eveline Peeters**, Vrije Universiteit Brussel, Belgium
Transcription Regulators in Thermoacidophilic Archaea Belonging to the Genus *Sulfolobus*: Homologies and Differences with Bacterial Regulators
- 11:35- KL27 **Thomas J. Santangelo**, Colorado State University, USA
FttA, a CPSF73 Homologue, Terminates Transcription in Archaea
- 12:00- KL28 **Roderick I. Mackie**, University of Illinois, USA
Enzymatic Mechanisms Utilized by the Thermophilic Bacterium *Caldanaerobius polysaccharolyticus* to Hydrolyze Hemicellulose
- 12:25-13:30 Lunch
- 13:30-14:20 **Keynote Lectures** Room A
Chair: Shinsuke Fujiwara
- 13:30- KL29 **Li Huang**, Chinese Academy of Sciences, China
Biochemical and Functional Insights into Post-Translational Modifications in *Sulfolobus islandicus*
- 13:55- KL30 **Masafumi Yohda**, Tokyo University of Agriculture and Technology, Japan
Structure and Functional Characterization of Prefoldin from the Thermophilic Fungus, *Chaetomium thermophilum*
- 14:20-14:50 Coffee Break

14:50-15:50 **Closing Session** Room A

Chair: Patrick Forterre

14:50- CL1 **Ken Takai**, Japan Agency for Marine-Earth Science and Technology, Japan
How Do Microbes Live at Certain High Temperatures? Lessons from Field Observations
and Energetics

Chair: Yoshizumi Ishino

15:20- CL2 **Isaac Cann**, University of Illinois at Urbana-Champaign, USA
Evolution of Replication Protein A across the Archaeal/Eukaryal Lineages

15:50-16:05 **Poster Awards Ceremony** Room A

16:05-16:20 **Closing Ceremony** Room A
