

SCIENTIFIC
PROGRAM

Genome Informatics

Precision Medicine

& Clinical Omics

-- in a world of

Data Economies


HELLENIC BIOINFORMATICS 2018



THESSALONIKI, NOVEMBER 15-18, 2018



HB-11 PRE-CONFERENCE WORKSHOPS**Thursday, November 15, 2018**

Venue	Computer Laboratory , Computer Science and Numerical Analysis Department, School of Mathematics, Aristotle University of Thessaloniki
08:30-09:00	Registration & Coffee
Workshop I	Proteomics Workshop – Hands-on
	Proteomics Bioinformatics: From raw MS-data to, knowledge - Hands-on Workshop <i>Chair: Michalis Aivaliotis</i>
09:00-09:15	Introduction to proteomics - <u>Michalis Aivaliotis</u> <ul style="list-style-type: none"> ○ <i>Brief history of MS-based proteomics</i> ○ <i>State-of-the-art quantitative MS-based proteomics approaches</i>
09:15-10.30	Bioinformatics I – MS-Raw data processing - <u>G. Orfanoudaki, K. Psatha, M. Aivaliotis</u> <ul style="list-style-type: none"> ○ <i>Proteome identification, quantitation and characterization</i> ○ <i>Available bioinformatics platforms for MS-data processing</i> ○ <i>Quality control and filtering of proteomics data</i>
10:30-13:00	Bioinformatics II – Meta-data analysis and visualization - <u>N. Fikas, G. Orfanoudaki, A. Malousi, K. Psatha, M. Aivaliotis</u> <ul style="list-style-type: none"> ○ <i>Comparative proteomics analysis</i> ○ <i>Functional proteome annotation</i> ○ <i>GO terms and pathways enrichment analysis</i> ○ <i>Protein-protein interaction networks</i> ○ <i>Visualization of proteomics data</i>
13.00-14.00	 Coffee break
Workshop II	RNA-Seq and ChIP-Seq data analysis – Hands-on
	Advanced RNA-Seq and ChIP-Seq data analysis – Hands-on Workshop <i>Chair: Andigoni Malousi, Lab. of Biological Chemistry, School of Medicine, AUTH</i>
15:00-15:30	Introduction to sequencing technologies - <u>Andigoni Malousi, Stefania Maniatsi</u> <ul style="list-style-type: none"> ○ <i>From Sanger to nanopores: Advances in sequencing technologies</i> ○ <i>Public data repositories and data formats</i> ○ <i>Basic processing steps and bioinformatics tools</i>
15:30-16:00	Prerequisites - <u>Andigoni Malousi, AUTH IT expert</u> <ul style="list-style-type: none"> ○ <i>Introduction to the AUTH's cluster environment</i> ○ <i>Basic bash commands</i> ○ <i>Working environment setup</i>
16:00-18:00	RNA-Seq data analysis - <u>Andigoni Malousi, Stefania Maniatsi</u> <ul style="list-style-type: none"> ○ <i>Fetching raw RNA-Seq data from public repositories</i> ○ <i>Quality control and mapping to reference genome</i> ○ <i>Quantification and differential gene expression</i> ○ <i>Visualisation and downstream analysis (fusion genes, gene set enrichment)</i>
18:00-20:00	ChIP-Seq data analysis - <u>Andigoni Malousi, Stefania Maniatsi</u> <ul style="list-style-type: none"> ○ <i>Quality control and trimming of raw reads</i> ○ <i>Mapping to reference genome</i> ○ <i>Peak calling</i> ○ <i>Visualization and peak annotation</i>
	Important Notes: <ul style="list-style-type: none"> - Number of maximum participants 30 - A digital textbook and references will be provided to all participants in advance. - The organizers will provide computers with all the required bioinformatics tools and demo data

HB-11 CONFERENCE AGENDA**Friday, November 16, 2018****Theme: DATA ECONOMIES**08:00-12:00 **Registrations****Conference Opening Session**

Chair: Zacharias Scouras and Ilias Kappas

09:00-10:00 **HB-11 Welcome notes and Conference outline**

- Ilias Kappas, *HB-President, AUTH*
- Despoina Vokou, *Head of School of Biology, AUTH*
- Chariton-Sarl Chintiroglou, *Dean, Faculty of Sciences, AUTH*
- Asterios Karagiannis, *Head of School of Medicine, AUTH*
- Pericles Mitkas, *Rector, AUTH*
- Pantelis Angelidis, *President AIZ*
- Christos Ouzounis, *HB-11 co-chair*
- Nikos Kyrpides, *HB-11 chair*

Session 1: Data Ecosystems

Chair: Anastasia Chasapi and Nikos Kyrpides

10.00-10:40

**Keynote Talk****Giorgos Papadopoulos**, CEO, Atypon, USA*Scientific editors: how to use them for collaboration, integration with experimental data and submissions*

10:40-11:00

Coffee break

11.00-11:25



Invited Talk

Andreas Persidis, President, Hellenic BioCluster, & CEO BioVista Inc., Greece*Big data and AI in healthcare - so where's the money in an AI-powered health industry?*

11:25-11:50



Invited Talk

Stavros Papadopoulos, CEO, TileDB Inc., USA*Managing genomics data with TileDB*

11:50-12:15



Invited Talk

Cath Brooksbank, Head of the EMBL-EBI Training Program, UK*Nurturing a bioinformatics training program - from gestation to the teenage years'*

12:15-12:30



Short Talk

Pantelis Angelidis, President, Alexander Innovation Zone, Greece*Health data ecosystems in health tourism*

12:30-12:45



Short Talk




Maria Chatzou, Founder & CEO, LifeBit, UK*How AI is powering genomics and personalized medicine, and setting new computational standards*

13:00-14:00	 Lunch	
Session 2: Bio-Economy <i>Chair: Irimi Angelidaki and Anastasios Chanalaris</i>		
14:00-14:40		Keynote Talk
		Victor de Lorenzo , Professor, National Center of Biotechnology, Spain
		<i>Scaling-up bioremediation from the test tube to planet Earth: what we need to know</i>
14:40-15:05		Invited Talk
		Costas Kiparissides , Professor Emeritus, CERTH/CPERI and Aristotle University of Thessaloniki, Greece
		<i>Model-based intensification and optimization of biopolymers production in microbial factories</i>
15:05-15:30		Invited Talk
		Vassily Hadzimanikatis , Professor, EPFL, Switzerland
		<i>Databases, computational methods, and models for a bio-based economy</i>
15:30-15:45		Short Talk
		Dominik Danso , Universität Hamburg, Germany
		<i>Finding rare enzymes in nature with high value to bioeconomy: Identifying novel PET hydrolases</i>
16:00-16:30	 Coffee break	
Session 3: International Programs <i>Chair: Amaryllis Malegiannaki and George Spyrou</i>		
16:30-17:10		Keynote Talk
		Lynn Schriml , Assoc. Professor, University of Maryland, USA
		<i>International microbiome data coordination and consortium studies</i>
17:10-17:35		Invited Talk
		Eddy Rubin , Chief Scientific Officer, Metabiota, USA
		<i>The Global Virome Project</i>
17:35-18:00		Invited Talk
		Sophie Schbath , Research Director, INRA, France
		<i>The French "Microbial Ecosystems & Meta-omics" metaprogram from INRA</i>
18:00-18:15		Short Talk
		Christos Arvanitidis , Research Director, Hellenic Center for Marine Research (HCMR), Crete, Greece
		<i>Research infrastructures and their collaborative potential in addressing challenging scientific questions at global scale</i>
18:15-18:30	Group Photo	



Session 4: Roundtable – Infrastructures and ElixirChair: *Babis Savakis and Christos Ouzounis*

18:30-19:15	Participants: <ul style="list-style-type: none"> • Alfonso Valencia (Spain) • Ioannis Xenarios (Switzerland) • Giorgos Spyrou (Cyprus) • Nikos Kyrpides (USA)
19:15-20:15	🎯 Poster Session & Reception
21:00-23:00	🎯 Speakers Dinner (<i>reservations required for non-invited speakers</i>)

Saturday, November 17, 2018**Theme: GENOME INFORMATICS****Session 5: Metabolic Engineering and Omics Approaches**Chair: *Georgia Orfanoudaki and George Tsiamis*

09:00-09:40		Keynote Talk
		Peter Karp , Director, Bioinformatics Research Group, Artificial Intelligence Center, SRI, USA
		<i>Computing metabolic routes in organism communities</i>
09:40-10:05		Invited Talk
		Steven Hallam , Professor, University of British Columbia, Canada
		<i>Global scale metabolic pathway reconstruction from environmental genomes</i>
10:05-10:20		Short Talk
		Sotirios Vasileiadis , Research Scientist, University of Thessaly, Greece
		<i>Elucidating the roles and interactions of the members of a bacterial consortium along the degradation of the recalcitrant fungicide thiabendazole via a multi-omic approach</i>
10:30-11:00	☕ Coffee break & Posters	

Session 6: Human MicrobiomeChair: *Lynn Schriml and Michalis Aivaliotis*

11:00-11:25		Invited Talk
		Daniel van Der Lelie , Chief Scientific Officer, Gusto Global LLC, USA
		<i>Modular agent-based modeling platform for bridging interdisciplinary research in ecology, evolution, behavioral biology and computational neuroscience</i>
11:25-11:50		Invited Talk
		Todd DeSantis , Vice-President of Informatics, Second Genome, USA
		<i>Microbiome strain and protein level meta-analysis for therapeutic discovery</i>
11:50-12:15		Invited Talk
		Ruth Schmitz-Streit , Professor, Kiel University, Germany
		<i>Methanoarchaea as part of the human microbiome - friends or foes</i>

12:15-12:40		Invited Talk
		Rob Finn , Group Lead, European Bioinformatics Institute, UK
		<i>Increasing our knowledge of human gut microbiota</i>
12:40-12:55		Short Talk
		Nikos Kyrpides , Head, Prokaryote Super Program, DOE-JGI, USA
		<i>Novel biological insights from uncultivated genomes of the global human gut microbiome</i>
13:00-14:00	 Lunch	
Session 7: Metagenomics		
Chair: Elena Sarropoulou and Panos Kougias		
14:00-14:40		Keynote Talk
		Irimi Angelidaki , Professor, Technical University of Denmark, Denmark
		<i>Exploring the biogas microbiome</i>
14:40-15:05		Invited Talk
		Tom Curtis , Professor, University of Newcastle, UK
		<i>Multiscale modelling of microbial communities</i>
15:05-15:20		Short Talk
		Jihyun F. Kim , Professor, Yonsei University, Republic of Korea
		<i>Identification and isolation of a keystone species in the rhizosphere microbiome of tomato resistant to bacterial wilt</i>
15:20-15:35		Short Talk
		Stefano Campanaro , Professor, University of Padua, Italy
		<i>Definition of a novel strategy for assembly and binning of 148 shotgun sequenced samples collected from biogas reactors</i>
15:35-15:50		Short Talk
		George Tsiamis , Assist. Professor, University of Patras, Greece
		<i>Deciphering the dynamics of the insect gut microbiome</i>
15:50-16:05		Short Talk
		Vassiliki Lila Koumandou , Lecturer, Agricultural University of Athens, Greece
		<i>Comparative analysis of outer membrane vesicle proteins and their targeting signals</i>
16:05-16:30	 Coffee break & Posters	
Session 8: Computational Technologies		
Chair: Maria Chatzou and Pantelis Angelidis		
16:30-16:55		Invited Talk
		Mark Borodovsky , Regents' Professor, Georgia Tech, USA
		<i>Improving tools for structural annotation of genomes and metagenomes</i>


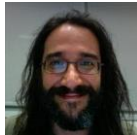
16:55-17:20		Invited Talk
		Folker Meyer , Professor, University of Chicago, USA
		<i>What a complex metagenome taught me about the need for reproducible workflows — Towards solving the microbiome reproducibility crisis</i>
17:20-17:35		Short Talk
		Maria de la Mercè Llabrés Segura , University of the Balearic Islands, Spain
		<i>Evaluation of virus-host gene relationship</i>
17:35-18:00		Invited Talk
		Aydin Buluc , Staff Scientist, Lawrence Berkeley National Lab, USA
		<i>Large-scale parallel computing for computational genomics</i>
18:00-18:15		Short Talk
		Georgios Pavlopoulos , Head of Bioinformatics, Biomedical Science Research Center “Alexander Fleming”
		<i>Expanding the protein space using metagenomic data</i>
18:15-18:40		Invited Talk
		Sergey Ovchinikov , Group Lead, Harvard University, USA
		<i>From new lineages of life and metagenomics to new protein families & complexes</i>
19.30-21:30	🍷 Dinner (<i>reservations required for non-invited speakers</i>)	
22:00-24:00	🍷 Social (optional concert)	

Sunday, November 18, 2018

Theme: **PRECISION MEDICINE & CLINICAL OMICS**

Session 9: **Developing Computational Biology in Greece and Cyprus**

Chair: *Vasilis Promponas and Ilias Kappas*



09:00-09:15		Strategy Talk
		Christos Ouzounis , Research Director, CERTH, Greece
		<i>Developing computational biology at meridian 23° E, and a little eastwards</i>
09:15-09:30		Strategy Talk
		Vasilis Promponas , Assist. Professor, University of Cyprus, Nicosia, Cyprus
		<i>Towards establishing the ELIXIR-CY node: aims, challenges and opportunities</i>
09:30-09:45	Roundtable discussion with students <ul style="list-style-type: none"> - Christos Ouzounis (Greece) - Vasilis Promponas (Cyprus) 	

Session 10: Translational Genomics

Chair: Florentia Konstantopoulou and Ioannis Iliopoulos


09:50-10:30		Keynote Talk
		Soren Brunak , Professor, Technical University of Denmark, Denmark
		<i>Population-wide analysis of disease trajectories in a 40-year perspective</i>
10:30-11:00	 Coffee break & Posters	
11:00-11:25		Invited Talk
		Ugur Sezerman , Professor, Acibadem University, Turkey
		<i>Integration of multiple omics data in a pathway related context reveals individualized disease aetiology and potential therapeutical targets in cancer</i>
11:25-11:50		Invited Talk
		George Spyrou , Head of the Bioinformatics Group, The Cyprus Institute of Neurology and Genetics, Cyprus
		<i>Network-based integration of multisource data from neurodegenerative diseases</i>
11:50-12:05		Short Talk
		Ian Cook , Clinical Solutions Manager – QIAGEN Bioinformatics, UK
		<i>QIAGEN bioinformatics – evidence driven precision medicine</i>
12:05-12:20		Short Talk
		Anastasios Chanalaris , Research Scientist, Kennedy Institute of Rheumatology, University of Oxford, UK
		<i>The Somalogic's Soma Scan aptamer platform in screening human osteoarthritic knee joint proximal synovial fluid</i>
12:20-12:35		Short Talk
		Michalis Aivaliotis , Assoc. Professor, School of Medicine, Aristotle University of Thessaloniki, & Group Leader and Director of Proteomics Facility, IMBB-FORTH, Crete, Greece
		<i>Functional and clinical proteomics in the era of precision medicine</i>

Chair: Nikos Kyrpides


12:40-13:00		Vision Talk
		Nektarios Tavernarakis , FORTH Chairman, Crete, Greece
		<i>Developing precision medicine in Greece</i>
13:00-14:00	 Lunch	

Session 11: Functional Genomics

Chair: Konstantina Psatha and Christos Ouzounis

14:00-14:40		Keynote Talk
		Alfonso Valencia , Life Sciences Department Director, Barcelona Supercomputing Center (BSC), ICREA Research Professor, Spain
		<i>Disease networks: In the search of the molecular basis of co-morbidity</i>

14:40-15:05		Invited Talk
		Alexandra Gruca , Assist. Professor, Silesian University of Technology, Poland
		<i>PersonALL – molecular diagnostics, multi-omics data integration and treatment personalization of acute lymphoblastic leukemia for Polish children</i>
15:05-15:30		Invited Talk
		Anton Enright , Group Lead, University of Cambridge, UK
		<i>Genome free prediction of microRNAs using machine learning</i>
15:30-15:45		Short Talk
		Kostas Billis , Ensembl Developer, European Bioinformatics Institute, UK
		<i>Gene annotation in Ensembl</i>
15:45-16:00		Short Talk
		Dimitrios Vlachakis , Assist. Professor, Agricultural University of Athens and Biomedical Research Foundation of the Academy of Athens, Greece
		<i>Insights into the mechanisms underlying antibody/antigen interactions using deep learning and data mining pipelines</i>
16:00-16:30	 Coffee break	
Session 12: Databases & Ontologies Chair: Lila Koumandou and Christos Arvanitidis		
16:30-17:10		Keynote Talk
		Ioannis Xenarios , Professor, University of Lausanne, Switzerland
		<i>Reference based knowledge from functional annotation of sequences to genome-scale models</i>
17:10-17:35		Invited Talk
		Ylva Ivarsson , Assoc. Professor, University of Uppsala, Sweden
		<i>Exploring transient protein-protein interactions and phosphoswitches</i>
17:35-18:00		Invited Talk
		Radoslav Davidovic , Research Scientist, Vinča Institute of Nuclear Sciences, Serbia
		<i>Prediction of human phenotype ontology terms using sequence information and enrichment analyses</i>
18:00-18:15		Short Talk
		Tereza Manousaki , Research Scientist, Hellenic Center for Marine Research (HCMR), Crete, Greece
		<i>A phylogenomic quest to find the closest sequenced relative of sparids: Challenges and new insights</i>
18:15-18:30		Short Talk
		Evangelos Pafilis , Research Scientist, Hellenic Center for Marine Research (HCMR), Crete, Greece
		<i>Text-mining-based interpretation of microbiome data</i>

18:30-18:45		Short Talk
		Anastasia Chasapi , Research Scientist, Swiss Institute of Bioinformatics, Switzerland
		<i>SourceData: A semantic platform to make data and figures discoverable</i>
18:45-19:00	Awards	
19:00-19:30	Society Matters – Ilias Kappas and H.bioinfo Board of Directors	
19:30-19:45	Concluding Remarks - Handoff to H.bioinfo-12	
	Adjourn	
00-22:00	🍷 Dinner (<i>reservations required for non-invited speakers</i>)	

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