



International Centre for Genetic
Engineering and Biotechnology

International Conference

Pandemic preparedness

Achievements, current challenges, and new frontiers

11-13 November 2024, Trieste
Savoia Excelsior Palace Hotel

EXTENDED SCIENTIFIC PROGRAM

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DAY 1 - NOVEMBER 11, 8.45-19.00

8.45	Registration (open all days)
9.15-10.00	Welcome session <i>Institutional greetings, 9.15-9.35</i> Caterina Petrillo , President of Area Science Park Lawrence Banks , Director-General of the International Centre for Genetic Engineering and Biotechnology – ICGEB Andrew Harrison , Executive Director of CERIC-ERIC
	<i>Introductions, 9.35-10.00</i> Federica Mantovani , Infrastructure Manager of the PRP@CERIC, RI project funded by PNRR, at Area Science Park <i>The PRP@CERIC project and Conference purposes</i> Giuditta De Lorenzo , Researcher and virologist at Area Science Park, <i>Introduction to the Conference and keynote speakers</i>
SESSION 1	Emerging and re-emerging viruses with pandemic potential <i>Chairs: Giuditta De Lorenzo (Area Science Park, Trieste, Italy) & Tom Peacock (The Pirbright Institute and Imperial College London, UK)</i>
10.00-10.45	Yoshihiro Kawaoka - University of Tokyo and National Center for Global Health and Medicine, Japan; University of Wisconsin-Madison, USA <i>Addressing the ongoing threat of emerging viral infections</i>
10.45-11.15	Welcome coffee
11.15-11.45	Rino Rappuoli - Biotechnopolo di Siena Foundation, Italy <i>Preparing the world for climate-driven amplifications of infections</i>
11.45-12.30	Vicenzi E. (IRCCS San Raffaele Scientific Institute, Milan, Italy) <i>Modulation of Zika Virus Replication in Human Monocytes and Monocyte-Derived Macrophages (MDM) Through Pro-Inflammatory (M1) Polarization</i> Furnon W. (MRC-University of Glasgow Centre for Virus Research, Glasgow, UK) <i>Phenotypic evolution of SARS-CoV-2 spike throughout the COVID-19 pandemic</i> Martinez-Orellana P. (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy) <i>SARS-CoV-2 damage to neuronal networks is mediated by the pro-inflammatory activation of the cGAS STING pathway in the glia</i>



12.30-13.00	Tatjana Avšič-Županc - University of Ljubljana, Slovenia <i>Outbreak preparedness at the Institute of Microbiology and Immunology in Ljubljana</i>
13.00-14.00	Light lunch
14.00-14.30	Maria Josè Ruiz Alvarez - Research Coordination and Promotion Service (CORI) and Italian National Institute of Health (ISS) <i>Advancing European Research: The role of National Health Institutions in European Partnerships linked to One Health Anti-Microbial Resistance, Pandemic Preparedness and through the collaboration with ECRIN/ItaCRIN</i>
SESSION 2	Diagnostics and Surveillance <i>Chairs: Alessandro Marcello (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy) & Danilo Licastro (Area Science Park, Trieste, Italy)</i>
14.30-15.00	Marta Giovanetti (University Campus Bio-Medico of Rome, Italy) <i>Using genomics to understand climate amplified diseases and epidemics</i>
15.00-16.00	Ulinici M. (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy) <i>Expanding Access to Sustainable Diagnosis in Africa-EXPANDIA</i> Prezelj N. (National Institute of Biology, Ljubljana, Slovenia) <i>Establishing robust and efficient system for surveillance of microorganisms in environmental waters</i> Valsesia A. (European Commission, Joint Research Centre, Varese, Italy) <i>Near-Real-Time Detection and Identification of Airborne Viral Threats</i> Baldini F. (University of Glasgow, Glasgow, UK & Ifakara Health Institute, Tanzania) <i>Infrared spectroscopy - a stop shop technology for vector-borne disease surveillance?</i>
16.00-16.30	Coffee break
16.30-17.15	Emma Thomson - MRC-University of Glasgow Centre for Virus Research and London School of Hygiene and Tropical Medicine, UK <i>Next generation sequencing approaches to enhance surveillance capacity for emerging viruses</i>
17.15-18.00	Annibaldis G. (Bernhard Nocht Institute of Tropical Medicine & German Center for Infection Research, Hamburg, Germany) <i>Enhancing Diagnostic Capacity for Viral Hemorrhagic Fevers in Guinea: Lessons Learned and Future Directions</i> Silvestri A. (Ca' Foscari University of Venice, Venice, Italy) <i>ACE2-modified graphene field-effect transistors, a new class of sensors for pandemic preparedness</i> Tilston-Lunel N. L. (Indiana University School of Medicine, Indianapolis, Indiana, USA) <i>Oropouche virus: An emerging orthobunyavirus</i>



18:00-18:15	Sponsored slot by beanTech srl Pezzetta A. (beanTech, Udine, Italy) & Lot R. (Area Science Park, Trieste, Italy) <i>Orfeo Data Center: Infrastructure, Hardware, and Software for Life Science Research</i>
18.15-19.00	Drinks and poster session
19.00	Welcome reception

DAY 2 - NOVEMBER 12, 8.30-18.00

SESSION 3	Drug discovery: stocking the shelves for the next pandemic <i>Chairs: Paola Storici (Elettra Sincrotrone Trieste S.C.p.A., Trieste, Italy) & Luca Braga (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy)</i>
08.30-10.00	Dattola F. (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy) <i>Host-directed therapy targeting proteostasis for Tick-borne Encephalitis Virus (TBEV) drug discovery</i> Laporte M. (KU Leuven, Leuven, Belgium) <i>An orally efficacious coronavirus assembly inhibitor that targets the viral M protein</i> Pagani I. (IRCCS San Raffaele Scientific Institute, Milan, Italy) <i>Repurposing Heparin Derivatives: A Promising Strategy for Antiviral Treatment of Zika Virus Infect</i> Narayan R. (Indian Institute of Science, Bengaluru, India) <i>Picolinic acid a broad-spectrum inhibitor of enveloped virus entry</i> Shanbhag A. (University of Bern, Bern, Switzerland) <i>Cross-neutralization of Morbillivirus by single-domain antibodies</i> White K. (Icahn School of Medicine at Mount Sinai, New York, USA) <i>The Democratization of Antiviral Drug Discovery for Pandemic Preparedness</i>
10.00-10.45	Johan Neyts - University of Leuven (KU Leuven), Belgium <i>Broader-acting antivirals for epidemic and pandemic preparedness</i>
10.45-11.15	Coffee break
SESSION 4	Artificial Intelligence (AI) and Machine Learning: tools for pathogen studies <i>Chairs: Alberto Cazzaniga (Area Science Park, Trieste, Italy) & Alessio Ansuini (Area Science Park, Trieste, Italy)</i>
11:15-11:45	Martin Weigt – Sorbonne Université, Paris, France <i>"Forecasting" protein evolution using data-driven sequence landscapes</i>



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- 11.45-12.30 **Cuturello F.** (Area Science Park, Trieste, Italy)
Enhancing predictions of protein stability changes induced by single mutations using MSA-based language models
Lytras S. (University of Tokyo, Tokyo, Japan)
Adapting broad protein language models to viruses with pandemic potential
Algaissi A. (Jazan University, Jazan, Saudi Arabia)
Discovery and characterization of Novel Pan-Coronavirus Inhibitors Using Artificial Intelligence

SESSION 5 Multidisciplinary approaches to pandemic preparedness

Chairs: Alberto Cassetta (CNR Institute of Crystallography - IC, Trieste, Italy) & Loredana Casalis (Elettra Sincrotrone Trieste S.C.p.A., Trieste, Italy)

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- 12.30-13.00 **Lucia Banci**, University of Florence and Instruct-ERIC, Italy
The NMR contribution to Cellular Structural Biology: from protein structures and their interactions to functional processes
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- 13.00-14.00 *Light lunch*
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- 14.00-14.30 **Daniel Hurdiss**, Utrecht University, Netherlands
Coronavirus pandemic preparedness through the lens of a structural biologist

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- 14.30-15.30 **Piccirilli F.** (Area Science Park, Trieste, Italy)
New IR approaches to study sars-cov2 mPro conformations
Rajnovic D. (Elettra Sincrotrone Trieste S.C.p.A., International Centre for Genetic Engineering and Biotechnology - ICGEB & Area Science Park, Trieste, Italy)
Label-free biochemical characterization and antiviral susceptibility of enveloped mammalian RNA virus in physiological-like conditions. A Road to Fast Response in Pandemic Preparedness and Countermeasure program
Waugh C. (Nord University, Steinkjer, Norway)
Real-time surveillance and pandemic prediction using GPS-nanobiosensor technologies in an interdisciplinary framework - Prediction2Response
Morasso S. (Elettra Sincrotrone Trieste S.C.p.A., Trieste, Italy)
Revision of a repurposing screen led to a new invalidation pipeline and identified a true novel inhibitor against papain-like protease from SARS-CoV-2

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- 15.30-16.00 *Coffee break*

SESSION 6 Vaccine development - design

Chairs: Emma Thomson (MRC-University of Glasgow Centre for Virus Research and London School of Hygiene and Tropical Medicine, UK) & Johan Neyts (University of Leuven – KU Leuven, Belgium)



16.00-17.00	<p>McFadden E. (University of Texas at Austin, Austin, Texas, USA) <i>Engineering, structure, and immunogenicity of a Crimean–Congo hemorrhagic fever virus pre-fusion heterotrimeric glycoprotein complex</i></p> <p>De Lorenzo G. (Area Science Park, Trieste, Italy) <i>Preclinical efficacy of an engineered VLP-based vaccine candidate against Zika virus</i></p> <p>Mammano F. (Université de Tours, Tours, France) <i>Comparison of the humoral immune responses induced by vaccination or natural infection by SARS-CoV-2</i></p> <p>Marchesin F. (Medicines and Healthcare products Regulatory Agency, Blanche Lane, South Mimms & University College London, London, UK) <i>A plug-and-play method to produce pseudotyped Bunyaviruses and their application in neutralisation assay</i></p>
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SESSION 7 Vaccine development - strategy & approach

Chairs: Emma Thomson (MRC-University of Glasgow Centre for Virus Research and London School of Hygiene and Tropical Medicine, UK) & Johan Neyts (University of Leuven – KU Leuven, Belgium)

17.00-18.00	<p>Campa C. (GlaxoSmithKline – GSK, Siena, Italy) <i>How to ensure rapid supply of safe and efficacious vaccines in pandemic scenarios? A company perspective</i></p> <p>Askary H. (Coalition for Epidemic Preparedness Innovations – CEPI, London, UK) <i>CMC Platform Best Practices for Comparability Assessments and Manufacturing Process Validation - Simultaneous submission to multiple Health Authorities using Accumulus Synergy platform</i></p> <p>McGoldrick M. (Merck & Co., Inc., Kenilworth, New Jersey, USA) <i>How to accelerate the supply of vaccines to all populations worldwide? Part III: Reflections after the Pandemic</i></p> <p>Särnefält A. (Coalition for Epidemic Preparedness Innovations – CEPI, Oslo, Norway) <i>Developing a manufacturing and supply chain strategy to support the 100 Days Mission</i></p>
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20.30 *Social dinner*

DAY 3 - NOVEMBER 13, 09.00-16.45

SESSION 8 Risk and mitigation of viral zoonoses

Chairs: Giuditta De Lorenzo (Area Science Park, Trieste, Italy) & Pamela Martinez-Orellana (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy)

09.00-09.45	<p>Marion Koopmans - Erasmus University Medical Center, Netherlands <i>Pandemic preparedness with a focus on prevention</i></p>
09.45-10.45	<p>Gallo G. (The Pirbright Institute, Pirbright, Surrey, UK) <i>Insight into the scope of alphacoronavirus receptor usage</i></p>



	<p>Lyons K. (University of Edinburgh, Edinburgh, UK) <i>Assessing Stakeholder Collaboration within Highly Pathogenic Avian Influenza Risk Governance Strategies in the UK and USA</i></p> <p>Gracias S. (Institut Pasteur, Paris, France) <i>Investigating the replication of BANAL-236 and related viruses in bat cells</i></p> <p>Seppola A. (Nord University, Bodø, Norway) <i>Attitudes and Practices of Humans to Flying Foxes and Viral Threats in Battambang Province, Cambodia: a Pilot Study</i></p>
10.45-11.15	Coffee break
11.15-11.45	<p>Tom Peacock - The Pirbright Institute and Imperial College London, UK <i>Investigating the origins and mammalian spillover potential of the ongoing H5N1 panzootic</i></p>
SESSION 9	<p>Global health</p> <p><i>Chairs:</i> Lucia Banci (University of Florence and Instruct-ERIC, Italy) & Alessandro Marcello (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy)</p>
11.45-12.15	<p>Fabrizio Maggi - National Institute for Infectious Diseases Lazzaro Spallanzani IRCCS, Rome, and University of Insubria, Varese, Italy <i>The comprehensive response to autochthonous outbreaks of dengue virus: the approach of the National Institute for Infectious Diseases "L. Spallanzani" in Rome</i></p>
12.15-12.45	<p>Menegale F. (Fondazione Bruno Kessler & University of Trento, Trento, Italy) <i>Impact of routine prophylaxis with monoclonal antibodies and maternal immunisation on respiratory syncytial virus burden in the Lombardy region, Italy</i></p> <p>Pezzella A. (University of Naples Federico II, Naples, Italy) <i>Diagnostic contribution of a medicine laboratory in the recent pandemics</i></p>
12.45-13.30	Light lunch
SESSION 10	<p>Biosecurity, infrastructure and cooperation</p> <p><i>Chairs:</i> Fabrizio Maggi (National Institute for Infectious Diseases Lazzaro Spallanzani IRCCS, Rome, and University of Insubria, Varese, Italy) & Mariana Ulinici (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy)</p>
13.30-14.00	<p>Alessandro Marcello – International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy <i>The challenges of pandemic preparedness and biosecurity – act locally to protect globally</i></p>
14.00-14.30	<p>Jonathan Ewbank - European Research Infrastructure on Highly Pathogenic Agents - ERINHA, Belgium</p>



Fostering pandemic preparedness and response research: the case of European Research Infrastructure on Highly Pathogenic Agents (ERINHA)

- 14.30-15.45 **Steinke S.** (Karolinska Institutet, Stockholm, Sweden)
Centralised Diagnostic and Surveillance Laboratory Capacity for Public Health Emergency Preparedness and Response - A Case Study Analysis of the National Pandemic Center at Karolinska Institutet, Sweden
- Mattiuzzo G.** (Medicines and Healthcare products Regulatory Agency, Blanche Lane, South Mimms, UK)
The role of reference materials for outbreak preparedness
- Mikaty G.** (Institut Pasteur, Paris, France)
Suit-case mobile laboratory for international response to outbreak and epidemics
- Smith M.** (US Agency for International Development, Washington D.C., USA)
Establishing a Biorisk Management Committee in an International Aid Agency
- Moronta-Barrios F.** (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy)
Planetary Health at Risk: Emerging Threats and Future Preparedness
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- 15.45-16.15 **Closing session:** *Best poster awards, conclusions and final remarks*
- Alessandro Marcello** (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy)
- Giuditta De Lorenzo** (Area Science Park, Trieste, Italy)



Poster session

1. Abdi N. (University of Texas at Austin, Austin, USA)

Nipah Virus Immunogen Design

2. Ahuja S. (Centre for Research in Nanotechnology & Science, IIT Bombay, Mumbai, India)

Performance evaluation of dipstick-based wastewater surveillance of viruses through multi-operator Gage R&R study

3. Akurut G. G. (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy)

Utility of the Taqman Array card for detection of etiologies of Acute febrile illness in patients suspected to have Viral Hemorrhagic Fever Infections

4. Al-Mslemani E. (Ministry of Municipality, Doha, Qatar)

Epidemiology of Toxoplasma gondii Infection in Animals of the Arabian Peninsula: A Systematic Review and Meta-Analysis

5. Couteaudier M. (Université de Tours et CHRU de Tours, Tours, France)

Isolation and characterization of patient-derived monoclonal antibodies that neutralize SARS-CoV-2 variants

6. Dowall S. (UK Health Security Agency, Porton Down, Salisbury, Wiltshire, UK)

Susceptibility of brown rats (Rattus norvegicus) to mpox virus infection

7. Ferreira P.* (UK Health Security Agency, Porton Down, Salisbury, UK)

X-Ray Irradiation of Human Serum Samples for Downstream Serological Assays

*Presenter: **Dowall S.** (UK Health Security Agency, Porton Down, Salisbury, Wiltshire, UK)

8. Filhol T. (Institut Pasteur, Paris, France)

Sialic acids are cellular attachment factors for EV-D111

9. Jang J. (Institute of virology and immunology, Mittelhäusern, Switzerland)

Experimental characterization of saliva aerosols containing SARS-CoV-2 in an indoor chamber

10. Kalebić C. (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy)

Role of Tick-borne encephalitis virus non-structural proteins upon infection

11. Khan M. J. (Institute of Tropical Medicine, University of Sao Paulo, Sao Paulo, Brazil)

Development of a Target Amplicon Sequencing -based test for the simultaneous diagnosis and surveillance of viruses associated with neurological disorders

12. Orsini E. (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy)

Genomic Surveillance of Dengue Virus (Serotype 3) in the Afar Region, Ethiopia

13. Salvo P. F. (Università Cattolica del Sacro Cuore, Rome, Italy)

Tecovirimat for Severe Mpox: Assessing Its Clinical Effectiveness



14. Šušnjar U. (International Centre for Genetic Engineering and Biotechnology - ICGEB, Trieste, Italy)

Developing RT-LAMP for broad-spectrum detection of Zika virus

15. Ullah R. (Elettra Sincrotrone, Trieste, Italy)

Inhibition of NS2B-NS3 Proteases from all the four serotypes of Dengue Virus

16. Vestuto V. (University of Salerno, Italy)

Biochemical characterization of zonulin inhibitor AT1001 derivatives as potential anti SARS-CoV-2 drugs

17. Vickers M. (Bernhard-Nocht Institute for Tropical Medicine, Hamburg, Germany)

A Humanized-Mouse Model for Assessing Pathogenicity of Emerging Filoviruses

18. Windshügel B. (Fraunhofer ITMP, Hamburg, Germany)

AVITHRAPID – A European Consortium for the Development of Novel Broad-Spectrum Antivirals



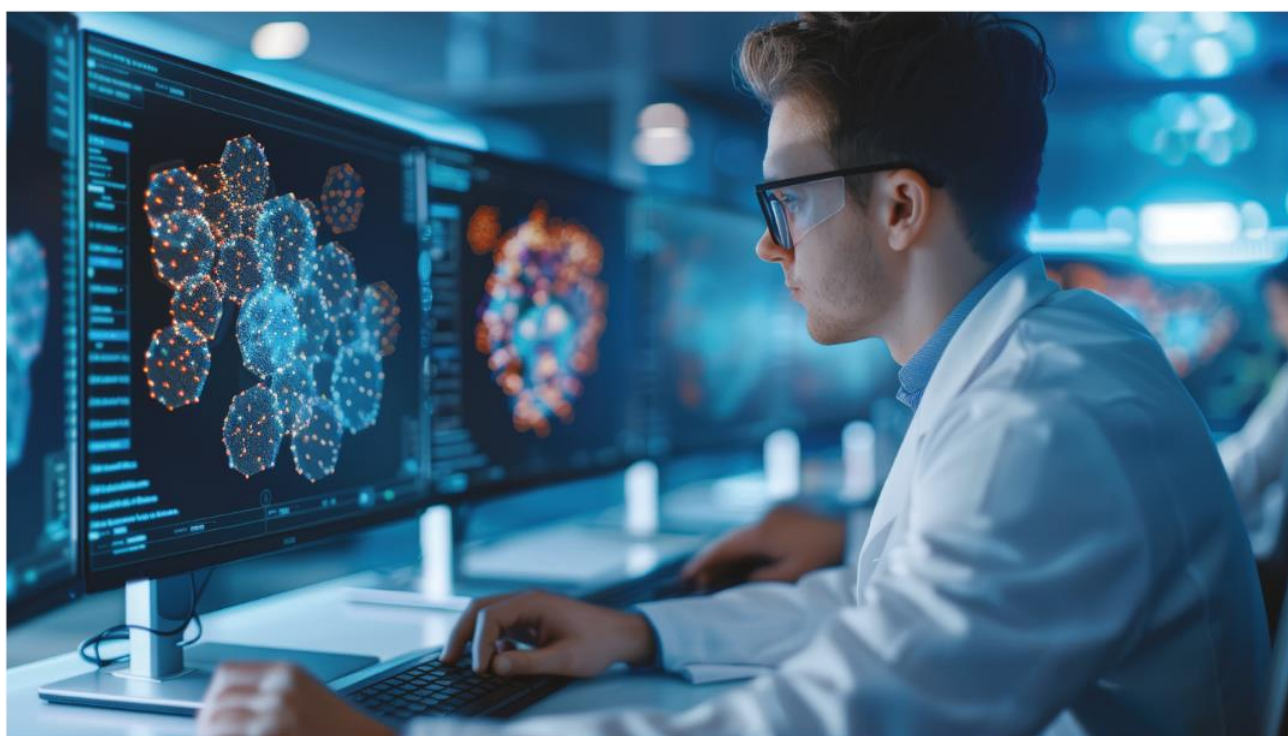
ACCELERATING RESEARCH WITH HPC SOLUTIONS AND ENABLING TECHNOLOGIES

Supercomputing infrastructure
and collaboration to tackle future
challenges in pandemic preparedness.



BEANTECH & NVIDIA: EMPOWERING LIFE SCIENCE WITH AI & HPC

beanTech is committed to supporting global scientific research with technology solutions that enhance global health resilience. Our AI and HPC platforms provide scientists with advanced tools to address upcoming pandemic challenges, ensuring that researchers are ready to respond quickly and effectively to any new threat.



beanTech supports organizations to design computing infrastructures that can take full advantage of technologies developed by NVIDIA such as:

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