

# Frontiers in MCM R&D

How advanced technologies are transforming development, evaluation and manufacturing of MCMs for epidemics & pandemics

## AGENDA

26 and 27 February 2026

13:00 – 18:00 Central European Time CET (each day)

Format: Virtual (Zoom)

[https://who.zoom.us/webinar/register/WN\\_URptdSD6SyKxSsl\\_dwt1K2A](https://who.zoom.us/webinar/register/WN_URptdSD6SyKxSsl_dwt1K2A)



**R&D**Blueprint

Powering research  
to prevent epidemics

## Background

The convergence of breakthroughs in immunology, genomics, synthetic biology, data science, and manufacturing is opening an unprecedented window to re imagine how the world designs, evaluates, and deploys medical countermeasures (MCMs) during epidemics and pandemics. At the same time, persistent gaps between scientific possibility and translation towards new or better MCMs mean that game changing innovations do not necessarily result in timely, equitable impact.

Platform technologies, AI enabled discovery, and regionalized manufacturing could enable faster, more distributed equitable outbreak responses, yet innovation and a myriad of uncoordinated research agendas have not fully caught up. This scientific consultation will focus on near to mid-term opportunities to close these gaps and promote the collaboration that will be needed to meet their full potential. It will convene leading scientists, innovators, product developers, regulators, and public health officials from all regions to interrogate recent advances and explore how they can be harnessed to strengthen pandemic research readiness and equitable access to MCMs. Discussions will be anchored around critical, forward looking questions, including:

- What scientific and technical barriers would still prevent a faster and fairer response to the next epidemic or pandemic?
- How can Collaborative Open Research Consortia (CORCs), using a family based strategy, enable cross pathogen adaptation of innovations and seamless integration of new tools into MCM R&D pipelines?
- What will it take to move from aspirational, innovation rich research roadmaps to concrete, resourced, and executable research programmes over the next 3–5 years?

## Proposed objectives

- Priority innovation opportunities across the MCM lifecycle: To identify high impact opportunities where emerging technologies can accelerate target identification, candidate optimization, and preclinical and clinical evaluation of vaccines, therapeutics, and diagnostics for epidemic and pandemic prone pathogens.
- Technology driven manufacturing and scale up models: To examine how innovation can increase the flexibility, speed, robustness, and regional reach of MCM manufacturing and surge scale up during outbreaks and pandemics.
- Collaborative approaches and seamless integration across pathogen families: To discuss how Collaborative Open Research Consortia (CORCs), organized around high risk families, can drive a family based strategy for MCM R&D.

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**DAY 1**

Chairperson: Philip Krause (WHO)

Time	Session	Speaker
13:00 – 13:10	Opening Remarks	Philip Krause (WHO)

**A FAMILY APPROACH TO ADDRESS UNCERTAINTY**

13:10 – 13:20	Addressing uncertainty/next pandemic: Why family-based approach? The CORCs in action	Ana Maria Henao-Restrepo (WHO)
13:20 – 13:30	Integrated viral family vaccine development: family-R&D roadmaps	Linfu Wang (Duke-NUS, Singapore)
13:30 – 13:40	Prototype pathogen strategy: scientific/regulatory balance	Nancy Sullivan (Boston University, the USA)
13:40 – 14:00	Family-wide MCM portfolios: vaccines/therapeutics/diagnostics	Richard Hatchett (CEPI)

**PROACTIVE PATHOGEN DISCOVERY & SURVEILLANCE**

14:00 – 14:15	Molecular pathogen discovery and genomic sequencing platforms	Ian Lipkin (Columbia University, the USA)
14:10 – 14:20	Metagenomic Surveillance Arrays for Viruses in Sewage	Tong Zhang (Hong Kong University)
14:20 – 14:30	Genomic surveillance in Africa	Nadim Rahman (EMBL-EBI)
14:30 – 14:40	Genomic surveillance in Africa	Tulio de Oliveira (Stellenbosch University, South Africa)
14:40 – 14:50	Equitable genomic Surveillance accelerate countermeasure development	Sebastian Maurer-Stroh (GISAID)

**VACCINES AND PATHOGEN X**

14:50 – 15:00	Generalizable Vaccine Antigen Design Options for Pandemic Preparedness	Barney Graham
15:00 – 15:10	Generative AI predicting evolution/vaccine design (EVEscape/EVEvax)	Sarah Gurev (MIT)
15:10 – 15:20	Structure-guided antigen stabilization	Bruno Correia (Swiss Federal Technology Institute of Lausanne)
15:20 – 15:30	AI antigen optimization immunogenicity	Jason McLellan (UT Austin, the USA)
15:30 – 15:40	Shared targets: conserved proteins/host pathways	Shibo Jiang (Fudan University, China)

PLATFORM OPTIONS & TRADE-OFFS FOR VACCINES		
15:40 – 15:50	Advancing mRNA vaccine platforms	Han Wen (DP Technology, China) <b>TBD</b>
15:50 – 16:00	Advancing mRNA vaccine for mucosal immunity and self-amplifying designs	Robin Shattock (Imperial College, the United Kingdom)
16:00 – 16:10	AI platform-specific optimization	Regina Barzilay (MIT, the USA)
16:10 – 16:20	Advanced vaccine platforms including mRNA technology, to enable rapid response to emerging infectious diseases	Kiat Ruxrungtham (Thai Red Cross AIDS Research Centre, Thailand)
16:20 – 16:30	AI-driven protein design novel MCMs	<b>TBD</b>
16:30 – 16:40	Next-gen intranasal/oral delivery	Hiroshi Kiyono (University of Tokyo, Japan)
16:40 – 16:50	Comparative immunology platforms	Sean Whelan (Wash University, the USA)
16:50 – 17:00	AI and supply Chain Management	Gustavo Ghory (Smarter Chains)
17:00 – 17:10	Platform Decisions under Real Constraints: Towards building a global interoperable system	Martin Friede
17:10 – 17:40	<p><b>Panel Discussions with Vaccine Developers</b> How could these innovations contribute/accelerate the development and evaluation of vaccines in the future?</p>	<p>Moderated by Marie Paule Kieny</p> <p>Albert Cagigi (IVI) Caryn Fenner (Afrigen) Joe Fitchet (IPD Dakar) Rosane Cuber (Fiocruz) <b>TBD</b> Nivedita Gupta (ICMR) Viviane Boaventura (Fiocruz) Herve Raoul (ANRS-MIE) Martin Friede</p>

**DAY 2**

Chairperson: Marco Cavaleri (EMA)

Time	Session	Speaker
<b>BROADENING VACCINE IMMUNE RESPONSES &amp; ADJUVANT INNOVATION</b>		
13:00 – 13:10	Speed versus breadth: evaluating platform flexibility for emerging threats - Introductory remarks	Marco Cavaleri (EMA)
13:10 – 13:20	Cross-reactive immunity conserved epitopes and Humoral/cellular balance strategies	Rino Rappuoli (Biotechnopolo di Siena Foundation)
13:20 – 13:30	Universal vaccine concepts - example of Coronaviruses	Florian Krammer (Mount Sinai, the USA)
13:30 – 13:40	Novel adjuvants for targeted immune modulation: TLR agonists, STING agonists, and saponin-based systems	Ken Ishii (Tokyo)
13:40 – 13:50	Adjuvant selection for specific populations: infants, elderly, and immunocompromised individuals	Ed Lavelle (Trinity College Dublin, Ireland)
13:50 – 14:00	Immune Programming Through Combinatorial Adjuvants	Bali Pulendran (Stanford University, the USA)
14:00 – 14:10	Adjuvant libraries and equitable access	Dan Fullen (CEPI)
14:10 – 14:20	Pan-family candidates: design/evaluation	Nimesh Gupta (National Ins. Immunology, India)

<b>THERAPEUTICS AND PATHOGEN X</b>		
14:20 – 14:30	AI-driven epitope prediction	Francisca Villanueva-Flores <b>TBD</b>
14:30 – 14:40	Cutting-edge monoclonal antibody technologies against pathogens	Ivelin Georgiev (Vanderbilt University, the USA)
14:40 – 14:50	Broad-spectrum antivirals pipeline	Adam Braunschweig (CUNY, the USA)
14:40 – 15:00	Pathogen-directed therapeutics: reality and challenges in broad-spectrum antivirals	Francesco Stellacci (EPFL, Switzerland)

<b>THERAPEUTIC INNOVATIONS</b>		
15:00 – 15:10	Long-acting antivirals and extended-release formulations: reducing treatment burden and improving adherence in resource-limited settings	Felix Wong (MIT, the USA)
15:10 – 15:20	Broad-Spectrum Nucleoside Analogues	Victoria C. Yan (University of Texas, the USA)
15:20 – 15:30	Broad-Spectrum Proteins	Michael C. Jewett (Stanford, the USA)

15:30 – 15:40	Brief background to set the stage for broad-spectrum small molecule antivirals	<b>TBD</b>
15:40 – 15:50	Accelerating structural analysis of viral targets with AI to enable progress on broad-spectrum antivirals	Jason Perry (Gilead)

### DIAGNOSTIC INNOVATIONS

15:50 – 16:00	Point-of-care diagnostic technologies: what innovations to develop portable, scalable, and affordable testing for remote and resource-limited settings	Ahmed Abd El Wahed (University of Leipzig, Germany)
16:00 – 16:10	NAATOS (Nucleic Acid Amplification Test on a Strip)	Paul Yager & Berhard Weigl (University of Washington, the USA)
16:10 – 16:20	Computational Multiplexed Point-of-Care Sensors	Artem Goncharov (UCLA, the USA)
16:20 – 16:30	Quantum/Nanomaterial Sensors	Ben Miller (UCL, the United Kingdom)
16:30 – 16:40	CRISPR-Based Diagnostics	<b>TBD</b>
16:40 – 16:50	CRISPR-Based Diagnostics	<b>TBD</b>

### SCIENCE AND INNOVATION AS ENABLERS OF EQUITABLE ACCESS TO MCMS

16:50 – 17:00	R3 Programme: RNA manufacturing technologies attributes	Dimki Patel (CEPI)
17:00 – 17:10	Continuous manufacturing approaches: reducing footprint, cost, and scale-up complexity for global access	Yvonne Genzel (Max Planck Institute, Germany)
17:10 – 17:20	Single-use bioreactor systems	Chris Chen <b>TBD</b>
17:20 – 17:30	Bridging the Gap: Integrating 3D Bioprinting and Microfluidics for Advanced Multi-Organ Models in Biomedical Research	Massimiliano Papi (Italy) <b>TBD</b>
17:30 – 17:40	Economic and safety case for "Digital Twins"	Richard Braatz (MIT, the USA)
17:40 – 17:50	Self-amplifying RNA (saRNA)	Nilay Shah (Imperial, the United Kingdom)
17:50 – 18:00	Biofoundries and distributed biomanufacturing networks: democratizing production capacity across regions	Jennifer Molloy (ICGEB, Italy)
18:00 – 18:10	Enabling Regionalised Vaccine Manufacturing: Platforms, Quality and Sustainability	Frederik Kristensen (RVMC, Norway)
18:10 – 18:20	RNAbox - a continuous, digital-twin-driven mRNA manufacturing process designed for small, regional sites	Zoltán Kis (University of Sheffield)
18:20 – 18:30	From innovation to impact - manufacturing innovations for CEPI's 100 Days Mission	Renske Hesselink (CEPI, Oslo, Norway)

18:30-18:40	Platform Decisions under Real Constraints: Building outbreak-ready Vaccine R&D in Africa	Marie-Angélique Sene (IPD Dakar, Senegal)
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WHAT IS NEXT?		
18:30	Main conclusions	WHO
18:40	Next steps	WHO

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