



Franco-Indian workshop on infectious diseases & antimicrobial resistance

An international initiative to strengthen research and innovation capabilities aimed at discovering new therapeutic and preventive approaches to pathogenic bacteria and antibiotic resistance



May 26-28, 2025, Toulouse

Centre de biologie intégrative
Amphithéâtre Nicole Le Douarin



UNIVERSITÉ
DE TOULOUSE



UNIVERSITÉ
DE TOULOUSE

Structure fédérative de recherche



PROGRAM of the FRANCO-INDIAN WORKSHOP on INFECTIOUS DISEASES and ANTIMICROBIAL RESISTANCE



An international collaborative initiative to strengthen research and innovation capabilities aimed at discovering new therapeutic and preventive approaches to pathogenic bacteria and antibiotic resistance.

Date: May 26-28, 2025

Venue: Centre for Integrative Biology, Amphitheatre Nicole Le Douarin and Reception Hall – 169 rue Marianne Grunberg-Manago, Université de Toulouse, 31062 Toulouse, France

Keywords: emerging or re-emerging infectious diseases, antimicrobial resistance/tolerance, surveillance/epidemiology, antimicrobial target, alternative therapies, host directed therapies, pathogenic bacteria, tuberculosis, ESKAPE, diagnostics, vaccines

Target Public: academic and private scientists with an interest in the field of (re-) emerging infectious diseases and antibiotic resistance and wishing to expand their international cooperation; Master and PhD students

Recent decades have seen unprecedented changes in human-environment interactions and increasing disruption of ecosystems and climate, creating a particularly favourable context for the (re-)emergence of infectious diseases. In addition to this threat, the worldwide spread of (multi-)antibiotic resistant bacteria represents a major short-term threat to global health. It is therefore essential and urgent to strengthen our efforts to put in place all the necessary means for prevention, surveillance and response to emerging infectious diseases and antibiotic resistance.

By combining their strengths and complementary resources, 9 core consortium international partners (4 French and 5 Indian) have made up the MIRA* "International Research Network (IRN)" in 2023, with the support of the CNRS (2023-2027). In 2024, 9 additional Indian partners joined the network, further strengthening this international collaborative effort. The 18 members of the current MIRA network share the common objective of strengthening their research and innovation capacities, from the most fundamental research to applied research for the discovery of new therapeutic and preventive approaches against pathogenic bacteria, through an international collaborative approach. The partners are committed to developing and structuring various areas of cooperation and implementing strategies to sustain their joint efforts in support of global health.

Initiated by the MIRA consortium, this Franco-Indian workshop is jointly organised in Toulouse by the IPBS, the LMGM-CBI, Infinity and the IRSD, with the main financial support of the CNRS and the CEFIPRA, and additional support of the Region Occitanie, the French Embassy in India, the ANTABIO company, the federative research structure "Biology and Biotechnologies for Health" (SFR-B2S) and the University of Toulouse.

For 4 half-days, 45 scientists in the field - 22 from India and 23 from France, including 26 men and 19 women ; among them, 10 young researchers, 6 from France and 4 from India, including 6 women and 4 men - will have the opportunity to present their work and exchange ideas with a view to developing, structuring or strengthening collaborative research programmes. The workshop is in hybrid format to allow participants to all over the world to attend.

This scientific and information event is designed to encourage the research community to develop cooperation with India, and to present existing funding mechanisms. The participation is open free of charge to the entire community. Masters and PhD students and postdoctoral fellows are strongly encouraged to participate to introduce themselves to international cooperation from their first research experience and offer them opportunities in India or France for further studies or career development.

Scientific Committee: Olivier Neyrolles (France, MIRA Coordinator), Amit Singh (India, MIRA Coordinator), Nathalie Campo (France), Anjana Badrinarayanan (India), Julien Vaubourgeix (France), Sheetal Gandotra (India)

Organizing Committee: Abel Abli, Mélanie Bégué, Marcelle Borro-Cosson, Anne Boyeldieu, Julien Brouzes, Nathalie Campo, Martin Campoy, Patricia Constant, Aélia Farge, Justine Fontaine, Chloé Garcia, Elodie Gayral, Gwenaëlle Jézéquel, Calum Johnston, Hedia Marrakchi, Leïla Mefoum, Rathies Ravindra, Isabelle Saves and Françoise Viala

Coordination: Isabelle Saves (MIRA Project Manager) – Contact: Isabelle.Saves@univ-tlse3.fr

More information: <https://www.ipbs.fr/mira2025/>

MIRA = Maladies Infectieuses émergentes et Résistance aux Antibiotiques / Emerging Infectious Diseases and Antimicrobial Resistance



UNIVERSITÉ
DE TOULOUSE

Structure fédérative de recherche



Day 1: 26 May 2025

Centre for Integrative Biology, Amphitheatre Nicole Le Douarin and Reception Hall

11:00 am: Indian delegates reception – *Upon invitation*

12:00 - 1:30 pm: Lunch with Indian delegates – *Upon invitation*

1:30 - 2:00 pm: Participant reception / Poster installation

2:00 - 2:30 pm: Welcoming speeches

2:30 - 3:30 pm: **Opening keynote lecture “The global AMR research landscape” by Prof. Marie-Cécile Ploy**, Head of the Bacteriology-Virology-Hygiene Department of Limoges Hospital (France), and Coordinator of the European Joint Action on Antimicrobial Resistance 2024-2027 (EU-JAMRAI 2)

3:30 - 3:45 pm: Coffee break

3:45 - 5:30 pm: **Scientific session 1 “Phenotypic AMR/Antibiotic tolerance”**, chaired by Anjana Badrinarayanan (NCBS, India) and Pierre Genevaux (LMGM-CBI, France)

- **Amit Singh (IISc, India)**
Reprogramming mitochondrial bioenergetics to target drug tolerance in *Mycobacterium tuberculosis* (15min pres. + 5min Q&A)
- **Julien Vaubourgeix (IRSD, France)**
Multiform AMR in mycobacteria (15min pres. + 5min Q&A)
- **Hélène Botella (IPBS, France)**
Use of genetic engineering for forward selection of high survival mutants of *Mycobacterium tuberculosis* *in vitro* and in host environments (10min pres. + 5min Q&A)
- **Matthieu Chavent (LMGM-CBI, France)**
Modelling host-pathogen interactions using multiscale MD simulations: the *Mycobacterium tuberculosis* case (10min pres. + 5min Q&A)
- **Asha Joseph (NCBS, India)**
Toggling the replisome: ensuring integrity of the genome across contexts (10min pres. + 5min Q&A)
- **Dhiraj Kumar (ICGEB, India)**
Host-pathogen crosstalk at the innate immune driveway (10min pres. + 5min Q&A)

5:30 - 7:00 pm: Poster session and social event

7:30 pm: Dinner of IRN MIRA partners – *Upon invitation*

Day 2: 27 May 2025

Centre for Integrative Biology, Amphitheatre Nicole Le Douarin and Reception Hall

8:30 - 8:45 am: Participant reception

8:45 - 8:55 am: Introduction of Day 2

8:55 - 10:15 am: Scientific session 2 "Surveillance of infectious diseases and antimicrobial resistance: emergence and evolution", chaired by Nathalie Campo (LMGM-CBI, France) and Amit Singh (IISc, India)

- **Vinay K. Nandicoori (CCMB, India)**
Evolution of drug resistance in *Mycobacterium tuberculosis* (15min pres. + 5min Q&A)
- **Samay Pande (IISc, India) & Olaya Rendueles-García (LMGM-CBI, France)**
Bacterial predators drive the maintenance of antibiotic resistance (15min pres. + 5min Q&A)
- **Romane Dusfour-Castan (LMGM-CBI, France)**
Caenorhabditis elegans as a model organism to study the emergence of antimicrobial resistance (10min pres. + 5min Q&A)
- **Audrey Goman (IRSD, France)**
War Among Microbes: A Strategy for Antibiotic Discovery? (10min pres. + 5min Q&A)
- **Bhupesh Taneja (CSIR-IGIB, India)**
A pathogenomics surveillance unveils widespread AMR in fungal dermatophytic infections in India (10min pres. + 5min Q&A)

10:15 - 10:30 am: Coffee break

10:30 - 12:30 nn: Scientific session 3 "Novel targets for novel antimicrobials", chaired by Hedia Marrakchi (IPBS, France) and Vinay K. Nandicoori (CCMB, India)

- **Ranjana Pathania (IIT Roorkee, India)**
Revisiting bacterial pathophysiological fitness determinants as potential drug targets (15min pres. + 5min Q&A)
- **Ramandeep Singh (THSTI, India)**
Identification of novel therapeutic interventions against *Mycobacterium tuberculosis* (15min pres. + 5min Q&A)
- **Anne Boyeldieu (LMGM-CBI, France)**
Deciphering the mode of action of the RumC1 bacteriocin in *Streptococcus pneumoniae* (10min pres. + 5min Q&A)
- **Martin Campoy (IPBS, France)**
Structural and enzymatic characterization of Baeyer-Villiger Monooxygenases from *Mycobacterium tuberculosis*: Insights into prodrug activation and structural features (10min pres. + 5min Q&A)
- **Harinath Chakrapani (IISER, India)**
Towards identifying new druggable targets through chemoproteomics (10min pres. + 5min Q&A)
- **Arunava Dasgupta (CSIR-CDRI, India)**
Discovering new drugs to combat old bugs: a quest for new arsenal against mycobacteria (10min pres. + 5min Q&A)
- **Sheetal Gandotra (CSIR-IGIB, India)**
Phospholipid remodelling in mycobacteria (10min pres. + 5min Q&A)
- **Xibing Xu (LMGM-CBI, France)**
Nucleotidyltransferase toxins MenT extend tRNA 3'-end to control *Mycobacterium tuberculosis* growth (10min pres. + 5min Q&A)

12:30 nn: Group photo

12:30 - 2:00 pm: Buffet lunch

2:00 - 3:00 pm: **Round table on India-France cooperation** moderated by Isabelle Saves (IPBS and CBI, France)

- Parvinder Kaur (FNDR, India)
- Marc Lemonnier (ANTABIO, France)
- Leelavati Narlikar (IISER Pune, India)
- Olivier Neyrolles (IPBS, France)
- Marie-Cécile Ploy (University of Limoges, France)
- Didier Raboisson (ENVT, France)
- Amit Singh (IISc, India)

3:00 - 4:00 pm: Coffee break and poster session

4:00 - 6:00 pm: **Scientific session 4 "Alternative therapies, host-directed and anti-virulence therapies"**, chaired by Sheetal Gandotra (CSIR-IGIB, India) and Dhiraj Kumar (ICGEB, India)

- Vivek Rao (CSIR-IGIB, India)
Importance of host cell metabolism in tuberculosis control - Cues for the development of novel host directed therapies (15min pres. + 5min Q&A)
- Christel Verollet (IPBS, France)
Deciphering mechanisms of cell-to-cell transfer of HIV-1 towards macrophages and their modulation by *Mycobacterium tuberculosis* (15min pres. + 5min Q&A)
- Rachit Agarwal (IISc, India) – *Online presentation*
Engineering approaches to tackle lung infections: bacteriophages and inhalable carriers (10min pres. + 5min Q&A)
- Saurabh Chugh (IPBS, France)
Exometabolome insights: A new perspective on *Mycobacterium tuberculosis* virulence (10min pres. + 5min Q&A)
- Ashwani Kumar (CSIR-IMTech, India)
Mycobacterial biofilms; Emerging hypothesis of *in vivo* drug tolerance and resistance (10min pres. + 5min Q&A)
- Debapriya Mukherjee (IISc, India)
Critical concentration of formate determines the susceptibility of *Salmonella* Typhimurium to meropenem and ciprofloxacin (10min pres. + 5min Q&A)
- Olivier Neyrolles (IPBS, France)
Sulfur metabolism in *Mycobacterium tuberculosis* response to stress (10min pres. + 5min Q&A)
- Albertus Viljoen (IPBS, France)
Surface organization of mycobacterial envelope glycans: Implications for immune interactions (10min pres. + 5min Q&A)

6:00 - 6:30 pm: Poster session

7:30 – 10:00 pm: Boat trip and cocktail dinner on the *Canal du midi* – All registred participants – Meeting point: Port Saint-Sauveur, 31000 Toulouse

Day 3: 28 May 2025

Centre for Integrative Biology, Amphitheatre Nicole Le Douarin and Reception Hall

8:30 - 8:45 am: Participant reception

8:45 - 9:00 am: Introduction of Day 3

9:00 - 11:00 am: **Scientific session 5 "From early discovery to clinical trial: tricks and opportunities"**, chaired by Arunava Dasgupta (CSIR-CDRI, India) and Olivier Neyrolles (IPBS, France)

- **Sidharth Chopra (CSIR-CDRI, India) – Online presentation**
Discovering drugs for bad bugs: Progress amongst challenges! (15min pres. + 5min Q&A)
- **Lionel Mourey (IPBS, France)**
Targeting an old target: Is mycobacterial InhA suitable for rational drug design? (15min pres. + 5min Q&A)
- **Parvinder Kaur (FNDR, India)**
Humanised 3-D granuloma predicting reactivation of tuberculosis (10min pres. + 5min Q&A)
- **Hugo Lebrette (LMGM-CBI, France)**
Structural dynamics of radical enzymes and metalloenzymes by femtosecond crystallography (10min pres. + 5min Q&A)
- **Hedia Marrakchi (IPBS, France)**
Mycobacterial cell envelope as an inspiring target for anti-tuberculosis drug discovery (10min pres. + 5min Q&A)
- **Avik Pathak (IIT Roorkee, India)**
Deciphering the role of cysteine biosynthesis pathway in the pathophysiology and virulence of *Acinetobacter baumannii* (10min pres. + 5min Q&A)
- **Maxime Pingret (IPBS, France)**
Exploring the role of a novel β 3-Tubulin expressing cell population in *Mycobacterium tuberculosis* pathogenesis (10min pres. + 5min Q&A)
- **Vijaya Vaishnavi (IISc, India)**
Tuberculosis granuloma organoids for studying host-pathogen interactions (10min pres. + 5min Q&A)

11:00 - 11:15 am: Coffee break

11:15 - 12:15 nn: **Closing keynote lecture "Towards antibiotic rescue by identifying and targeting emergent vulnerabilities in drug resistant bacteria" by Prof. Nagasuma Chandra**, Professor in the Biochemistry Department of the Indian Institute of Science (IISc) of Bangalore (India)

12:15 - 12:30 nn: Closing remarks

12:30 - 2:00 pm: Lunch – *Upon invitation*

Afternoon: Sightseeing tour in Carcassonne – *Indian delegates and organisers upon invitation*

Speakers and Chairs

We are pleased to welcome **45 speakers and chairs** for our Franco-Indian Workshop on Infectious Diseases and Antimicrobial Resistance, **22 from India and 23 from France**, including **26 men and 19 women**. Among them, 10 young researchers, 6 from France and 4 from India, including 6 women and 4 men, will present their work alongside experts in the field of antimicrobial resistance and infectious diseases.

Rachit Agarwal Indian Institute of Science, Bangalore (IISc, <https://be.iisc.ac.in/~rachit/>)

Anjana Badrinarayanan National Center for Biological Sciences of Bangalore (NCBS, <https://www.ncbs.res.in/>) - Chair Session 1

Anne Boyeldieu Postdoc in Patrice Polard's team, Laboratoire de Microbiologie et Génétique Moléculaires, Toulouse (LMGM-CBI, <https://cbi-toulouse.fr/eng/equipe-polard>)

Hélène Botella PI in Christophe Guilhot's team, Institute of Pharmacology and Structural Biology, Toulouse (IPBS, <https://www.ipbs.fr/molecular-mycobacterial-pathogenesis/>)

Nathalie Campo PI in Patrice Polard's team, LMGM-CBI, Toulouse (<https://cbi-toulouse.fr/eng/equipe-polard>) - Chair Session 2

Martin Campoy PhD student in Hedia Marrakchi's team, IPBS, Toulouse (<https://www.ipbs.fr/mycobacterial-envelopes-and-therapeutic-targets/>)

Harinath Chakrapani Indian Institute of Science Education and Research, Pune (IISER, <https://www.hclab.in/>)

Nagasuma Chandra IISc, Bangalore (<https://biochem.iisc.ac.in/nagasuma-chandra.php>) - Keynote speaker

Matthieu Chavent LMGM-CBI, Toulouse (<https://cbi-toulouse.fr/eng/equipe-m3bi>)

Sidharth Chopra CSIR-Central Drug Research Institute, Lucknow (CSIR-CDRI, <https://cdri.res.in/1826.aspx?id=1826>)

Saurabh Chugh Postdoc in Olivier Neyrolles' team, IPBS, Toulouse (<https://www.ipbs.fr/mycobacterial-interactions-with-host-cells/>)

Arunava Dasgupta CSIR-CDRI, Lucknow (<https://cdri.res.in/1776.aspx?id=1776>) - Chair Session 5

Romane Dusfour-Castan PhD student in Bouet/Cornet GEDY team, LMGM-CBI, Toulouse (<https://cbi-toulouse.fr/eng/equipe-gedy>)

Sheetal Gandotra CSIR-Institute of Genomics and Integrative Biology, New Delhi (CSIR-IGIB, <https://sites.google.com/site/gandotralab/people>) - Chair Session 4

Pierre Genevaux LMGM-CBI, Toulouse (<https://cbi-toulouse.fr/eng/equipe-genevaux>) - Chair Session 1

Audrey Goman PhD student in Eric Oswald's team, Institut de Recherche en Santé Digestive, Toulouse (IRSD, <http://en.irsd.fr/>)

Asha Joseph Postdoc in Anjana Badrinarayanan group, NCBS, Bangalore (<https://www.ncbs.res.in/>)

Parvinder Kaur FNRS, Principal Scientist, Foundation for Neglected Disease Research, Bangalore (FNDR, <https://www.fnldr.in/>)

Ashwani Kumar CSIR-Institute of Microbial Technology, Chandigarh (CSIR-IMTech, <https://www.imtech.res.in/contact/staff/dr-ashwani-kumar/114>)

Dhiraj Kumar International Centre for Genetic Engineering and Biotechnology, New Delhi (ICGEB, <https://www.icgeb.org/dhiraj-kumar/>) - Chair Session 4

Hugo Lebrette LMGM-CBI, Toulouse (<https://cbi-toulouse.fr/eng/equipe-mycomet>)

Marc Lemonnier CEO ANTABIO, Labège (<https://antabio.com/team/marc-lemonnier/>)



UNIVERSITÉ
DE TOULOUSE

Structure fédérative de recherche



Hedia Marrakchi IPBS, Toulouse (<https://www.ipbs.fr/mycobacterial-envelopes-and-therapeutic-targets/>) - Chair Session 3

Lionel Mourey IPBS, Toulouse (<https://www.ipbs.fr/structural-biophysics/>)

Debapriya Mukherjee PhD Student in Dipshikha Chakravorty's group, IISc Bangalore (<https://mcbl.iisc.ac.in/dclab/>)

Vinay Kumar Nandicoori CCMB, Hyderabad (CCMB, <https://www.ccmb.res.in/People/Research-Group/Vinay-K-Nandicoori>) - Chair Session 3

Leelavati Narlikar IISER, Pune (<http://sites.iiserpune.ac.in/~leelavati/>)

Olivier Neyrolles IPBS, Toulouse (<https://www.ipbs.fr/mycobacterial-interactions-with-host-cells/>) - Chair Session 5

Avik Pathak PhD Student in Ranjana Pathania's group, Indian Institute of Technology, Roorkee (IIT, <https://bt.iitr.ac.in/~BT/rpathfbs>)

Ranjana Pathania IIT, Roorkee (<https://bt.iitr.ac.in/~BT/rpathfbs>)

Samay Pande IISc, Bangalore (<https://mcbl.iisc.ac.in/samay-pande/>)

Maxime Pingret PhD student in Christel Verollet's team, IPBS, Toulouse (<https://www.ipbs.fr/index.php/phagocyte-architecture-and-dynamics>)

Marie-Cécile Ploy RESINFIT, Université de Limoges, Limoges (<https://www.unilim.fr/recherche/laboratoires/omegahealth/resinit/>) - Keynote speaker

Didier Raboisson Ecole nationale vétérinaire de Toulouse, Toulouse (<https://envt.fr/>)

Vivek Rao CSIR-IGIB, New Delhi (<https://www.igib.res.in/?q=VivekRao>)

Olaya Rendueles-García LMGM-CBI, Toulouse (<https://cbi-toulouse.fr/eng/equipe-rendueles>)

Isabelle Saves IPBS and CBI, Toulouse (<https://www.ipbs.fr/fr/cooperation-internationale-2/>)

Amit Singh Center for Infectious Disease Research, IISc Bangalore (<https://cidr.iisc.ac.in/amit/>) - Chair Session 2

Ramandeep Singh Translational Health Science and Technology Institute, Faridabad (THSTI, <https://thsti.res.in/en/faculty-profile/Ramandeep-Singh>)

Bhupesh Taneja CSIR-IGIB, New Delhi (<https://www.igib.res.in/?q=BhupeshTaneja>)

Julien Vaubourgeix PI in Eric Oswald's team, IRSD, Toulouse (<http://en.irsd.fr/>)

Christel Verollet IPBS, Toulouse (<https://www.ipbs.fr/index.php/phagocyte-architecture-and-dynamics>)

Vijaya Vaishnavi PhD Student in Rachit Agarwal group, IISc, Bangalore (<https://be.iisc.ac.in/~rachit/>)

Albertus Viljoen PI in Jérôme Nigou's team, IPBS, Toulouse (<https://www.ipbs.fr/immuno-modulation-by-mycobacterial-lipids-and-glycoconjugates/>)

Xibing Xu Postdoc in Pierre Genevoux's team, LMGM-CBI, Toulouse (<https://cbi-toulouse.fr/eng/equipe-genevoux>)