Multi-Drug Efflux Systems
From Molecular Mechanisms to Pharmacological Modulation

**SUNDAY June 12th**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>4:00 pm - 8:00 pm</td>
<td>Arrival and Check-in (Check-in Desk Closed 6:00 pm - 7:45 pm)</td>
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<tr>
<td>6:00 pm</td>
<td>Dinner</td>
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<tr>
<td>7:30 pm - 7:35 pm</td>
<td>Welcome / Introductory Comments by GRC Site Staff</td>
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<tr>
<td>7:35 pm - 7:40 pm</td>
<td><strong>Olga Lomovskaya &amp; Anthony George</strong>, Co-Chairs for Conference</td>
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<td>Introductory Comments &amp; Conference Welcome</td>
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<tr>
<td>7:40 pm - 9:30 pm</td>
<td><strong>Keynote Session</strong></td>
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<td>7:40 pm - 7:50 pm</td>
<td>Discussion Leader: <strong>Shimon Schuldiner</strong> (Hebrew University, Jerusalem, Israel)</td>
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<td>7:50 pm - 8:30 pm</td>
<td><strong>Piet Borst</strong> (University of Amsterdam, Amsterdam, Netherlands)</td>
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<td>&quot;Drug efflux transporters and their role in cancer cell resistance and survival&quot;</td>
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<tr>
<td>8:30 pm - 8:40 pm</td>
<td>Discussion</td>
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<tr>
<td>8:40 pm - 9:20 pm</td>
<td><strong>Hiroshi Nikaido</strong> (University of California, Berkeley, USA)</td>
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<td>&quot;Capture and transport of diverse substrates by transmembrane and cismembrane MDR pumps&quot;</td>
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<tr>
<td>9:20 pm - 9:30 pm</td>
<td>Discussion</td>
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**MONDAY June 13th**

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:30 am - 8:30 am</td>
<td>Breakfast</td>
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<tr>
<td>9:00 am - 12:30 pm</td>
<td><strong>Significance of Efflux in Multi-Drug Resistance</strong></td>
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<tr>
<td>9:00 am - 9:10 am</td>
<td>Discussion Leader: <strong>J.V. Piddock</strong> (University of Birmingham, UK)</td>
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<tr>
<td>9:10 am - 9:30 am</td>
<td><strong>Patrice Courvalin</strong> (Institute Pasteur, Paris, France)</td>
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<td>&quot;Efflux and Antibiotic Resistance in <em>Acinetobacter</em>&quot;</td>
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<tr>
<td>9:30 am - 9:40 am</td>
<td>Discussion</td>
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<tr>
<td>9:40 am - 10:00 am</td>
<td><strong>Dominique Sanglard</strong> (Vaudois University, Lausanne, Switzerland)</td>
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<td>&quot;Participation of ABC transporters in drug resistance and virulence in the human pathogen <em>Candida glabrata</em>&quot;</td>
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<td>10:00 am - 10:10 am</td>
<td>Discussion</td>
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<tr>
<td>10:10 am - 10:40 am</td>
<td>Coffee Break</td>
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<td>10:40 am - 11:00 am</td>
<td><strong>Patrick Plesiat</strong> (Hôpital Jean Minjoz, Besancon Cedex, France)</td>
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<td>&quot;Active efflux as part of the stress response in Gram negative bacteria&quot;</td>
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<td>11:00 am - 11:10 am</td>
<td>Discussion</td>
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<td>11:10 am - 11:30 am</td>
<td><strong>Susan Bates</strong> (National Cancer Institute, Bethesda, USA)</td>
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<td>&quot;Efflux Transporters and Drug Penetration: An Unproven Link&quot;</td>
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<tr>
<td>11:30 am - 11:40 am</td>
<td>Discussion</td>
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11:40 am - 12:00 pm Francoise van Bambeke (Catholic University of Louvain, Brussels, Belgium)
   "How do antibiotics play with efflux transporters in mammalian and bacterial cells?"

12:00 pm - 12:10 pm Discussion

12:10 pm - 12:25 pm Frederica Theodoulou (Rothamsted Research, Harpenden, UK)
   "ABC transporters in plants: multiple, broad or narrow substrate specificity?"

12:25 pm - 12:30 pm Discussion

12:30 pm Group Photo / Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 5:30 pm Poster Session

5:30 pm - 7:30 pm Diversity of Biological Functions
   Discussion Leader: Attilio Di Pietro (CNRS Lyon, France)

5:30 pm - 5:50 pm Michelle Haber (Children’s Cancer Institute for Medical Research, Australia)
   "Multidrug transporters as potential oncogenes"

5:50 pm - 6:00 pm Discussion

6:00 pm - 6:20 pm Robert Tampe (Frankfurt University, Germany)
   "Mechanism of ABC transporters in immunity"

6:20 pm - 6:30 pm Discussion

6:30 pm - 6:50 pm David Fidock (Columbia University, New York, USA)
   "Recent insights into antimalarial resistance mediated by Plasmodium falciparum multidrug efflux pumps"

6:50 pm - 7:00 pm Discussion

7:00 pm - 7:20 pm Jesus Blazquez (National Center for Biotechnology, Spanish Research Council, Madrid, Spain)
   "Role of MATE efflux pumps on oxidative damage protection and antimutation"

7:20 pm - 7:30 pm Discussion

8:00 pm Dinner

TUESDAY June 14th

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm Structure and Mechanism of Multi-Drug Efflux Pumps 1
   Discussion Leader: Robert Ford (University of Manchester, UK)

9:00 am - 9:10 am Markus Gruetter (University of Zurich, Zurich, Switzerland)
   "Structure and mechanism of heterodimeric ABC transporters"

9:30 am - 9:40 am Discussion

9:40 am - 10:00 am Suresh Ambudkar (National Cancer Institute, Bethasda, USA)
   "The mechanism of action of P-glycoprotein (ABCB1)"
10:00 am - 10:10 am Discussion
10:10 am - 10:40 am Coffee Break
10:40 am - 11:00 am Frances Sharom (University of Guelph, Ontario, Canada) "Probing the drug-binding pocket and drug transport mechanism of P-glycoprotein (ABCB1)"
11:00 am - 11:10 am Discussion
11:10 am - 11:30 am Richard Callaghan (University of Oxford, Oxford, UK) "Molecular mechanisms associated with multidrug resistance mediators"
11:30 am - 11:40 am Discussion
11:40 am - 12:00 pm Lutz Schmitt (Heinrich Heine University Duesseldorf, Germany) "X-ray meets flexible membrane transporters - pitfalls, challenges and insights"
12:00 pm - 12:10 pm Discussion
12:10 pm - 12:25 pm Alice Rothnie (Aston Triangle, Birmingham, UK) "Detergent free purification of ABC transporters using SMA polymer"
12:25 pm - 12:30 pm Discussion
12:30 pm Lunch
1:30 pm - 4:00 pm Free Time
4:00 pm - 5:30 pm Poster Session
5:30 pm - 7:30 pm New Methods to Study Membrane Transporters
Discussion Leader: Helen Zgurskaya (Oklahoma University, Norman, USA)
5:30 pm - 5:50 pm Fraser MacMillan (University of East Anglia, Norwich, UK) "Watching membrane proteins move using EPR spectroscopy"
5:50 pm - 6:00 pm Discussion
6:00 pm - 6:20 pm Anna Seelig (University of University of Basel, Switzerland) "New methods to monitor P-glycoprotein activity: Microphysiometry and NMR in living cells"
6:20 pm - 6:30 pm Discussion
6:30 pm - 6:50 pm Arnaud Ducruix (Paris Descartes University, Paris, France) "Structural and Dynamical Insights into the Opening and assembly Mechanism of P. aeruginosa efflux pumps"
6:50 pm - 7:00 pm Discussion
7:00 pm - 7:20 pm Xiao-Hong Nancy Xu (Old Dominion University, Norfolk, USA) "Nanoassay for Real-Time Molecular Probing of Multidrug Membrane Transporters"
7:20 pm - 7:30 pm Discussion
8:00 pm Dinner
WEDNESDAY June 15
7:30 am - 8:30 am Breakfast
9:00 am - 12:30 pm  **Structure and Mechanism of Multi-Drug Efflux Pumps 2**

9:00 am - 9:10 am  Discussion Leader: **Martin Pos** (University of Frankfurt, Germany)

9:10 am - 9:30 am  **Hendrik van Veen** (University of Cambridge, UK)  
"Mechanisms of drug and ion transport by the MFS multidrug transporter LmrP"

9:30 am - 9:40 am  Discussion

9:40 am - 10:00 am  **Eitan Bibi** (Weizmann Institute of Science, Rehovot, Israel)  
"Molecular aspects of secondary multidrug transport"

10:00 am - 10:10 am  Discussion

10:10 am - 10:40 am  Coffee Break

10:40 am - 11:00 am  **Hassane S. Mchaourab** (Vanderbilt University, Nashville, USA)  
"Structural Dynamics of Multi-Drug Transporters"

11:00 am - 11:10 am  Discussion

11:10 am - 11:30 am  **Paolo Ruggerone** (University of Cagliari, Italy)  
"Molecular modeling of antibiotic translocation coupled to functional rotation in AcrB"

11:30 am - 11:40 am  Discussion

11:40 am - 12:00 pm  **Edward Yu** (Iowa State University, Iowa, USA)  
"Crystal structures of the CusA efflux pump"

12:00 pm - 12:10 pm  Discussion

12:10 pm - 12:25 pm  **Ute Andrea Hellmich** (Goethe University Frankfurt, Germany)  
“Extensive conformational changes throughout the ATP hydrolysis cycle of the ABC multidrug transporter LmrA"

12:25 pm - 12:30 pm  Discussion

12:30 pm  Lunch

1:30 pm - 4:00 pm  Free Time

4:00 pm - 5:30 pm  **Poster Session**

5:30 pm - 7:30 pm  **Control of Gene Expression / Modulation of Activity**

5:30 pm - 5:50 pm  Discussion Leader: **Karl Kuchler** (Medical University Vienna, Austria)  
**William Shafer** (Emory University School of Medicine, Georgia, USA)  
"Genetic control of drug efflux pump gene expression in Neisseria gonorrhoeae: implications for pathogenesis"

5:50 pm - 6:00 pm  Discussion

6:00 pm - 6:20 pm  **Scott Moye-Rowley** (University of Iowa, Iowa City, USA)  
"Regulation of Multidrug Resistance in Fungi"

6:20 pm - 6:30 pm  Discussion

6:30 pm - 6:50 pm  **Gert Fricker** (University of Heidelberg, Heidelberg, Germany)  
"Regulation of ABC drug transporters by nuclear receptors"

6:50 pm - 7:00 pm  Discussion
7:00 pm - 7:20 pm  Toshihisa Ishikawa  (RIKEN, Yokohama, Japan)  
"Pharmacogenomics of human ABC transporters"

7:20 pm - 7:30 pm  Discussion

7:30 pm - 8:00 pm  Business Meeting

Nominations for the next Vice Chair; Fill out Conference Evaluation Forms; Discuss future Site & Scheduling preferences; Election of the next Vice Chair

8:00 pm  Dinner

THURSDAY June 16th

7:30 am - 8:30 am  Breakfast

9:00 am - 12:30 pm  Approaches to Overcome/Modulate Multiple Drug Resistance

9:00 am - 9:10 am  Discussion Leader: Susan Bates  (National Cancer Institute, Bethesda, USA)

9:10 am - 9:30 am  Zhe-Sheng (Jason) Chen  (St. John's University, New York, USA)  
"PDE5 inhibitors as modulators of ABC transporter-mediated multidrug resistance in cancer"

9:30 am - 9:40 am  Discussion

9:40 am - 10:00 am  Heidrun Potschka  (Ludwig Maximilian University, Munich, Germany)  
"Targeting regulation of P-glycoprotein: a novel approach to overcome drug resistance"

10:00 am - 10:10 am  Discussion

10:10 am - 10:40 am  Coffee Break

10:40 am - 11:00 am  Gergely Szakacs  (Institute of Enzymology, Budapest, Hungary)  
"Exploiting the paradoxical hypersensitivity of MDR cells: hitting cancer's Achilles' heel"

11:00 am - 11:10 am  Discussion

11:10 am - 11:30 am  Charles Thompson  (University of British Columbia, Vancouver, Canada)  
"Chemical inactivation of drug efflux systems to increase the activities of clinically proven antibiotics against Mycobacterium tuberculosis"

11:30 am - 11:40 am  Discussion

11:40 am - 12:00 am  Jean-Michel Bolla  (School of Medicine, Marseille, France)  
"Competitive- and noncompetitive inhibition of efflux pumps: from a natural source to the synthesis of new compounds"

12:00 am - 12:10 pm  Discussion

12:10 pm - 12:20 pm  Short talk (TBD)

12:20 pm - 12:30 pm  Discussion
12:30 pm Lunch
1:30 pm - 4:00 pm Free Time
4:00 pm - 5:30 pm Poster Session
5:30 pm - 7:30 pm Polyspecific Transporters in Drug Discovery, Development and Response

5:30 pm - 5:40 pm Discussion Leader: **Wright Nichols** (AstraZeneca, Waltham, USA)
5:30 pm - 5:50 pm **Charles Dean** (Novartis, Cambridge, USA)
"Efflux and Gram negative antimicrobial drug discovery: always the twain shall meet"

5:50 pm - 6:00 pm Discussion
6:00 pm - 6:20 pm **Mark Warren** (Optivia Biotechnology, Menlo Park, USA)
"Transporting Drug Development Past Roadblocks on the Critical Path"
6:20 pm - 6:30 pm Discussion
6:30 pm - 6:50 pm **Joseph Polli** (GSK, USA)
"What's all the flux about? Case studies of the importance of drug transporters in drug discovery and development"
6:50 pm - 7:00 pm Discussion
7:00 pm - 7:20 pm **William Guggino** (John Hopkins University, Baltimore, USA)
"Processing mutations in ABCG2, newly recognized as a urate efflux pump, are associated with high plasma urate and gout"
7:20 pm - 7:30 pm Discussion
8:00 pm Dinner

**FRIDAY June 17th**
7:30 am - 8:30 am Breakfast
9:00 am Departure