



## ABC transport proteins in environmental health and toxicology

International Conference

Certosa di Pontignano (Siena, Italy), 18-21 October 2007

### Program

#### October 18<sup>th</sup> (Thursday)

**18:00** - Welcome note – Silvano Focardi- Rector of the University of Siena

**18.10** - Goals of conference and how we proceed: Tvrtko Smital

**18:20** - Plenary lecture - David Epel “Why are we here”

#### October 19<sup>th</sup> (Friday)

**09:00- AM session:** “Biology of environmental MDR – significance of ABC transport proteins in environmental context”

**Chairs: Gary Cherr and Amro Hamdoun**

**Keynote lecture**      **Dr. David S. Miller**

*National Institutes of Health, National Institutes of Environmental  
Health Sciences, Research Triangle Park, NC, USA*

**“ABC transporters as moving targets: regulatory signals that alter  
xenobiotic efflux”**

#### **Oral presentations**

##### **Regulation of activity**

**10:00** - (816) From location to function: reorganization of cell surfaces and multidrug transporter activity in sea urchin embryos  
*Amro Hamdoun and David Epel*

**10:20** - (791) Regulation of ATP binding cassette transporter A1 (ABCA1) by *para*-nonylphenol in first trimester human placenta  
*Francesca Ietta, Nicoletta Bechi, Roberta Romagnoli, Giuseppina Sorda, Carlo Buffi, Luana Ricci Paulesu*

**10:40 Coffee break**

## Studies on model embryos

- 11:10** – (801) Comparing Multixenobiotic Resistance during early development across three marine invertebrate phyla  
*Nature McGinn, Gary Cherr*
- 11:30** - (804) Cost, effectiveness, and environmental relevance of multi-drug transporters  
*Bryan Cole, David Epel*
- 11:50** - (807) ABC xenobiotic transporters in embryos of the zebrafish *Danio rerio* - I. Expression profiles  
*Stephan Fischer, Till Luckenbach*
- 12:10** - (805) ABC xenobiotic transporters in embryos of the zebrafish *Danio rerio* - II. Transporter activities  
*Till Luckenbach, Mady Ahnert, Stephan Fischer, Robert Suchsland, Kristin Schirmer*
- 12:20** - (802) Characterizing Multixenobiotic Resistance during early development in the zebrafish (*Danio rerio*)  
*Mary Langsner, Gary Cherr, Russell Flegal*

**15:00 - PM session:** “Chemosensitizers - “ABC inhibitors” as emerging contaminants”  
**Chairs: Till Luckenbach and Tvrtko Smital**

## Oral presentations

### Chemosensitization I

- 15:00-** (799) Pharmaceuticals in the environment may inhibit efflux transporters (P-glycoprotein and MRP proteins)  
*Fent Karl, Caminada Daniel, Zaja Roko, Smital Tvrtko*
- 15:20** - (798) Effects of pharmaceuticals on efflux transporter (P-glycoprotein and MRP proteins) in the fish cell line PLHC-1 and a doxorubicin resistant PLHC-1 subclone  
*Caminada Daniel, Zaja Roko, Smital Tvrtko, Fent Karl*
- 15:40** - (812) Elimination of MXR inhibitory pharmaceuticals from waste waters by membrane bioreactor, reversal osmosis, nanofiltration and ozonization  
*Branka Pivcevic, Ivana Skukan, Tvrtko Smital*

### 16:00 Coffee break

### Chemosensitization II

- 16:30** - (813) Expression and activities of different ABC transporter types in gills of the marine mussel *Mytilus californianus*  
*Till Luckenbach, Rolf Altenburger, David Epel*
- 16:50** - (808) Multidrug resistance associated protein (MRP) transport activity mediates differences in susceptibility to inorganic and organic mercury in sea urchin (*Strongylocentrotus purpuratus*) embryos  
*Ivana Bošnjak, Kenneth Coale, Jasna Franekić Čolić, Tvrtko Smital, David Epel, Amro Hamdoun*
- 17:10** – (811) Reconsidering the phenomenon of chemosensitization – “toxicity” versus physiological disturbance?  
*Tvrtko Smital*

18:00

Poster session

- (810) Ecological consequences of exposure to natural oil contamination: population level costs of the MDR mechanism  
*Heather M. Coleman, Amro M. Hamdoun, Hunter S. Lenihan*
- (788) ABC transporters in Indian-rock oyster *Saccostrea forskali* and their role in the export of an organic pollutant tributyltin  
*Sutin Kingtong, Yaowaluk Chitramvong, Tavan Janvilisri, Chantragan Srisomsap, Jisnusan Svasti*
- (786) Regulation of the MXR system in Mediterranean mussels exposed to algal toxins under environmental conditions  
*Silvia Franzellitti, Sara Buratti, Roberto Poletti, Antonio Capuzzo, Elena Fabbri*
- (797) Isolation of partial cDNA sequences encoding ABC transporters from the sea louse *Lepeophtheirus salmonis* (Crustacea: Copepoda)  
*Anke Treuner Freeman, Armin Sturm, Stephen George*
- (809) Development and characterization of P-glycoprotein 1 (Pgp1; ABCB1) mediated doxorubicin-resistant PLHC-1 hepatoma fish cell line  
*Roko Zaja, Daniel Caminada, Jovica Loncar, Karl Fent, Tvrko Smital*
- (795) Effects of exposure to perfluorooctane sulfonate and to prestige like fuel-oil on the gene expression of ABC-transport proteins in thicklip grey mullet *Chelon labrosus*  
*Oihane Diaz De Cerio, Eider Bilbao, Miren P Cajaraville, Ibon Cancio*
- (794) Phytochelatin synthase responses in cadmium tolerant *Cyperus imbricatus* Retz.  
*Kunaporn Homyog*
- (822) Cloning and functional characterization of apical efflux transporters (ABCB1, ABCB11 and ABCC2) in rainbow trout (*Oncorhynchus mykiss*) hepatocytes  
*Roko Žaja, Vesna Munić, Roberta Sauerborn Klobučar, Andreja Ambriović Ristov, Tvrko Smital*
- (823) Cloning and mRNA expression analysis of an ABCG2 (BCRP) efflux transporter in rainbow trout (*Oncorhynchus mykiss*) liver and primary hepatocytes  
*Roko Žaja, Vesna Munić, Tvrko Smital*
- (817) Gene expression of multixenobiotic resistance proteins, P-glycoprotein and MPR2 in two Antarctic species: dusky rockcod (*Trematomus newnesi*) and striped rockcod (*Trematomus hansonii*)  
*Sara Zucchi, Ilaria Corsi, Francesco Regoli, Silvano Focardi*
- (824) Are permanent fish cell lines suitable tools for studies on xenobiotic ABC transporters? First results.  
*Sabine Schnell, Cinta Porte, Kristin Schirmer, Till Luckenbach*
- (814) Pesticides and their metabolites interact with human efflux transporters  
*Oosterhuis Berend, Vukman Krisztina, Vagi Erika, Glavinias Hristos, Jablonkai Istvan, Krajcsi Peter*

## **October 20<sup>th</sup> (Saturday)**

**09:00- AM Session:** “Identification, complexity, nomenclature - emerging aspects in the study of environmental ABC transporters”

**Chairs: Karl Fent and Ilaria Corsi**

**Keynote lecture Prof. Susan P.C. Cole**

*Queen's University Cancer Research Institute, Kingston, ON, Canada*

**“The MRP1 drug and organic anion transporter: Structural determinants of its activity and substrate selectivity”**

### **Oral presentations**

#### **Evolutionary studies**

**10:00** - (803) Transport of heavy metals by Multidrug Resistance-associated Proteins. A small review, from yeast to humans

*Sandra Prévéral, Landry Gayet, Nathalie Picault, Anne-Claire Cazalé, Hélène Jacquet, Henri-Pierre Suso, Enrico Martinola, Gilles Peltier, Youngsook Lee, Cyrille Forestier*

**10:20** - (800) The ABC transporter gene family of *Daphnia pulex*

*Armin Sturm, Anke Treuner-Freeman, George Stephen*

### **11:00 Coffee break**

#### **Expression of ABC transporters I**

**11:30** - (785) P-glycoprotein expression in killifish from Sydney Tar Ponds, Nova Scotia, Canada

*Christine Paetzold, Shannon Bard*

**11:50** - (784) Expression of Multixenobiotic Resistance (MXR) related gene products in Mediterranean mussels

*(Mytilus galloprovincialis) exposed to environmental stress factors*

*Silvia Franzellitti, Sara Torrielli, Aldo Viarengo, Elena Fabbri*

**12:10** - (793) MXR in circulating cells from echinoderms and mussel

*Ketil Hylland, Ingeborg Ronning, Silje Roysland*

**14:30 - PM Session:** “ABC transport proteins in biomonitoring/biomarker research”

**Chairs: Christophe Minier and Angela Köhler**

### **Oral presentations**

#### **Expression of ABC transporters II:**

##### **Biomarker relevance**

**14:30** - (818) Biomarker corelevance and minimizing uncertainty

*Daniel Salvito*

**14:50** - (792) Gene expression of Multixenobiotic Resistance proteins, P-glycoprotein and MRP2 in the Antarctic

*Emerald rockcod (Trematomus bernacchii)*

*Sara Zucchi, Ilaria Corsi, Shannon Mala Bard, Francesco Regoli, Robert Richards, Christine Paetzold,*

*Silvano Focardi*

**15:10** - (796) P-gp expression in blue mussel during the tidal cycle

*Christophe Minier, Julie Letendre, H el ene Budzinski, Fabrice Durand*

**15:30** - (815) MXR-related defence during early liver injury and carcinogenesis in flounder *Platichthys flesus* L. from differently polluted North Sea regions

*Angela Koehler, Tilmann Alpermann, Uwe John, Cornelis J.F. Van Noorden, Bjarne Lauritzen, Moshe Tom*

**15:50** - (790) Development of a behavioural toxicological assay to measure P-glycoprotein activity at the blood-brain barrier and evaluate the neuropathological effects of environmental contaminants

*Shannon Mala Bard, Simon Gadbois*

## **16:15 Coffee break**

**16:45 Round table discussion: “Perspectives of environmentally oriented ABC research – strengths, weaknesses and research priorities”**

Moderators: **David Epel** and **Ron van der Oost**

Introductory talks:

### **FP7 perspective**

*Massimo Ferri, University of Siena*

### **Assessment of human and environmental risks by monitoring the effects of toxic substances**

*Ron van der Oost*

**19:45 Social event**

Transfer to Siena by bus

Concert of the Ensemble Phal ese at the Pellegrinaio- Pilgrim Hall (Santa Maria della Scala Museum)

Dinner at the Corticella (Santa Maria della Scala Museum)

## **October 21<sup>st</sup> (Sunday)**

**09:00 Closing remarks – Tvrtko Smital and Ilaria Corsi**

**09:30 Steering Committee session**

*evaluation of the conference and discussion and planning of future initiatives*