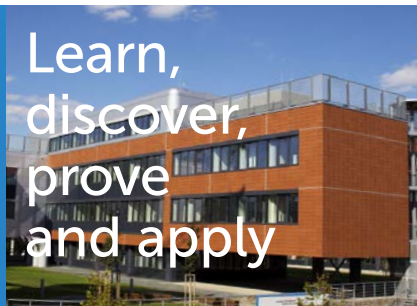




# RECETOX NEWSLETTER

RECETOX NEWSLETTER is a quarterly newsletter by the Research Centre for Toxic Compounds in the Environment (RECETOX), Brno, Czech Republic

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discover,  
prove  
and apply



RECETOX is an independent REsearch Centre for TOXic Compounds in the Environment operating within the Faculty of Science, Masaryk University, Brno, Czech Republic.

The Centre fulfils three roles: an academic institution providing university education, a research institution working on transformation of research into practical applications and a body supporting implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) and of sound chemicals management in general, nationally and internationally.

## In this issue

- SONDAR-ELSA conference
- New activities in India and Slovakia
- Opportunities for cooperation



## Editorial

Dear readers,

This newsletter showcases a variety of our disciplines and recent successes in project calls. It looks at sampling campaigns abroad and briefly describes new international research projects. It provides new opportunities for cooperation at the European level and for in-house training in using electronic tools for the implementation of the Stockholm Convention on Persistent Organic Pollutants.

We would like to wish all the best to those who are defending the results of their research at their bachelor, master or PhD degree exams these days and we hope many of them will shine in future research contests as did our students in the Sigma Aldrich Contest this year.

Last but not least, we would like to warmly welcome international visitors and participants to the 10th Summer School on Toxic Compounds and to project meetings taking place over the summer in our premises.

Enjoy reading and have a great summer – both productive and relaxing!

Katka Šebková, on behalf of the editors

*P.S. — The RECETOX newsletter is also available automatically if registered through [www.recetox.muni.cz](http://www.recetox.muni.cz) or [newsletter@recetox.muni.cz](mailto:newsletter@recetox.muni.cz) and exists in English, Czech and Russian. The next issue will be out in late October 2014.*



## Calendar of Events

- June 22–26, 2014, **Summer School on Protein Engineering**, Loschmidt Laboratories, Brno
- June 23–28, 2014, **10th International Summer School on Toxic Compounds**, RECETOX, Brno
- June 27–28, 2014, **CSI Marie Curie project meeting**, RECETOX, Brno
- July 8–9, 2014, **EDCs Experts Meeting, WHO ECEH**, Bonn, Germany
- Early September 2014 **meeting of the CEE ROG in RECETOX**, Brno
- September 2014 **DENAMIC project partners meeting**, RECETOX, Brno
- October 2014 **Annual meeting of Stockholm Convention Regional Centres**, Geneva, Switzerland
- October 2014 **18th meeting of the National Centre for Toxic Compounds Council**, Prague, Czech Republic
- November 3–8, 2014, **6th meeting of the INC Minamata Convention**, Bangkok, Thailand
- November 10–13, 2014, **Global Coordination Group meeting (GMP)**, Geneva, Switzerland
- December 14–16, 2014, **2nd Meeting Open-Ended Working Group**, SAICM, Geneva, Switzerland

## Spring 2014 in RECETOX

### SONDAR Conference – Protecting the Soil



The RECETOX Centre in collaboration with the European Land and Soil Alliance (ELSA) organized a 3-day international conference SONDAR-ELSA for 100 participants from the Czech Republic, Austria, Germany, UK, and the European Commission – experts, officials and students specialized in soil protection – at the Lednice castle conference centre, South Moravia from May 14–16 2014.

Conference participants heard keynote speeches by SONDAR project partners on the comparative survey of the water erosion in South Moravia and Austria, unfortunately without optimistic results. The survey has shown inadequacy of existing control measures to minimize erosion. Water currently washes away between one and several tens of tonnes of fertile topsoil per hectare per year, which are then stored in rivers and reservoirs. Should the trend continue, we would lose all agricultural land by the end of this millennium. The importance of soil for overall biodiversity is often neglected, but a handful of fertile topsoil contains more microorganisms than the total population of the Earth.

Dr. Helena Bendová from the Czech Ministry of the Environment spoke on upcoming amendments to the legislation on the protection of agricultural land, Claudia Olazabal, Director of the Department of the Agriculture, Forest and Soil at the European Commission explained that the Commission had withdrawn its proposal for the Soil Protection Directive due to a clash between societal interests and private property rights. The discussion held that further postponing of EU legislation may significantly contribute to the irreversible damage to soil – a non-renewable natural resource. Finally, Dr. Václav Cílek lectured on perspectives and risks of further land and water use including the impacts and examples







of unsustainable management and water and land scarcity - potential conflict in many countries on other continents. Activities of the SONDAR project inspired nine towns of the South Moravia region to take actions and fulfil requirements for becoming ELSA members. Mr. Christian Steiner, chairman of the ELSA, distributed membership certificates to the nine mayors at the conference.

In addition, RECETOX hosted a side event on the eve of the conference. This was a reception with the exhibition "Painting with Colours of the Earth" showing 150 pieces of artwork by children and residents of retirement homes from South Moravia, Vysočina and Lower Austria regions. Ms. Irena Raček, promoter of the art of painting with soil pigments in Austria, together with Libor Kabát, mayor of Lednice town opened the exhibition. Using soil pigments for painting is one of the ways to make the public aware of the soil, land and the importance of their protection. Over 200 visitors, young artists and conference participants were amazed by exhibited works and they were eager to try themselves.

"The young generation of today has not the same ties to the land in comparison to our ancestors, who were directly dependent on the land for their living. Nevertheless, painting with soil pigments or even seeing those beautiful images created by children and elderly can have a great positive impact - reconstitute the relations to the soils and surrounding lands for many" said Milan Sážka, coordinator of the SONDAR project and organizer of the conference.

The SONDAR project is implemented under the framework of cross-regional cooperation between the Czech Republic and Austria ([www.sondar.eu/cz](http://www.sondar.eu/cz)).



## RECETOX News

### Research Team Awarded by the J. G. Mendel Prize

Dies Academicus celebrations at the Masaryk University took place in kino Scala in Brno on May 6, 2014. The Rector of the Masaryk University, Dr. Mikuláš Bek, awarded outstanding researchers, and the best PhD and Master students of the University. The research team of Professor Damborský received the J.G. Mendel Prize for Outstanding Results with International Significance for their research on protein stabilization by engineering of access tunnels published in *Angewandte Chemie* and in a US Patent. Congratulations!

### Sigma Aldrich Prize

Sigma-Aldrich Company Ltd. in cooperation with the Slovak Chemical Society, Czech Chemical Society, and Czech Society for Biochemistry and Molecular Biology organizes a contest for young researchers (students and young scientists under 35 years) each year. They award two grants in total for the best research in organic chemistry and related fields, and for the best research in biochemistry and related fields. The final round of the 2014 contest was held at the XIV. Interdisciplinary Meeting of Young Biologists, Biochemists and Chemists in Milovy (Devět skal) on May 12–16, 2014. The jury selected ten nominees out of 143 participants and awarded two grants and honorary mentions.

We are proudly announcing that RECETOX PhD student Pavel Dvořák (Biotechnology group of Professor Jiří Damborský) won the biochemistry grant (chemicals of choice for 3000 USD) for his work on rational engineering of synthetic pathway for biodegradation of toxic environmental pollutants and that bachelor degree student, Tomáš Pastierik (Photochemistry and Supramolecular Chemistry group of Professor Petr Klán) was among the five nominees for chemistry award for his work on new class of fluorescent dyes based on pyronin skeleton intended for bioimaging.



*Pavel Dvořák (first from left) and other winners of the Sigma-Aldrich competition, archive RECETOX*

### New Papers Published

RECETOX staff continues to publish results of its research in prestigious peer-reviewed journals in a higher rate than previous years. So far 46 research papers were published in 2014, such as, for example:

- Jarošová, B. et al: What level of estrogenic activity determined by in vitro assays in municipal waste waters can be considered as safe? *Environment International* 64C, 98–109.
- Pastierik T. et al.: Near-Infrared Fluorescent 9-Phenylethynylpyronin Analogues for Bioimaging. *J. Org. Chem.* 2014, 79, 3374–3382.
- Damborsky, J., Brezovsky, J.,: Computational Tools for Designing and Engineering Enzymes. *Current Opinion in Chemical Biology* 19: 8–16.
- Dvorak, P., et al: Immobilized Synthetic Pathway for Biodegradation of Toxic Recalcitrant Pollutant 1,2,3-Trichloropropane in *Environmental Science & Technology*.
- Novak, J. et al.: Composition and effects of inhalable size fractions of atmospheric aerosols in the polluted atmosphere. Part II. In vitro biological potencies. *Environment International* 63: 64–70.

### Homeplace Lecture Series

A series of short home-town or home-land informal lectures by our international staff took off in May 2014. The Tuesday afternoon seminars started by the series founder, Olga Popova, on May 27, 2014, when she introduced St. Petersburg. June talks have seen Celine Degrendele who spoke about the northern France and Lisa Melymuk introduced beauties of Canada to the RECETOX audience. The aim is to share photos, information and experience about life in a different country.

Contact Olga ([popova@recetox.muni.cz](mailto:popova@recetox.muni.cz)) for more details and calendar, these lectures are open to all interested and would start again in September 2014.



### Short Announcements

We are happy to announce the birth of children to our young researchers over the spring 2014. Congratulations to Klára Šmídová on the birth of her son Martin, and to Klára Komprdová and Jiří Komprda on the birth of their son Jiří.





## International Cooperation and Training

### CYANOCOST – Managing Risks of Cyanobacteria in European Water Bodies



Cyanobacterial blooms resulting from anthropogenic nutrient pollution are one of the major problems in European freshwaters. The outcome is degradation of reservoir stability and disruption of ecosystem services such as drinking water production, aquaculture and recreation. CYANOCOST – EU COST Action ES1105 “Cyanobacteria blooms and toxins in water resources: Occurrence, impacts and management” – aims at coordinating and networking ongoing efforts and capabilities across Europe for the risk management of cyanobacteria and cyanotoxins in water bodies, by establishing a strong collaboration between academia, authorities, industry and citizens.

Currently, this COST (European Cooperation in Science and Technology) expert network comprises more than 70 experts from 28 European countries, Israel and USA and focuses on cyanobacteria producing a wide range of potent toxins with adverse health effects to humans and animals. Other CYANOCOST activities include promotion of best practices in cyanobacterial bloom and cyanotoxin control, as well as development of guidelines (handbooks) on monitoring, analysis, toxicity assessment and efficient toxin removal from drinking waters.



The RECETOX Centre plays a key role in this action. Professor Luděk Bláha, vice-chair of the CYANOCOST action, coordinates the pan-European situation assessment and development of the database on the occurrence and fates of cyanobacteria and cyanotoxins in fresh-, transitional and some coastal marine waters, and of the associated health, economic and social impacts.

CYANOCOST also supports a technology transfer via a programme of young researcher training visits to expert laboratories. Currently, Eliška Sychrova, a PhD student from RECETOX, is undertaking a research stay at University of Helsinki with Prof. Kaarina Sivonen.

Training workshops for practitioners and end-users on harmonization of methods in analyses of cyanobacterial blooms and toxins as well as information materials and guidance flyers in national languages and instruction videos on contaminants such as antibiotics, pharmaceuticals, pesticides and other chemicals in water are planned 2014–2016.

Everyone is welcome to join the CYANOCOST community! See [www.cyanocost.com](http://www.cyanocost.com) for more information or contact the vice-chair ([blaha@recetox.muni.cz](mailto:blaha@recetox.muni.cz)) regarding participation in workshops.

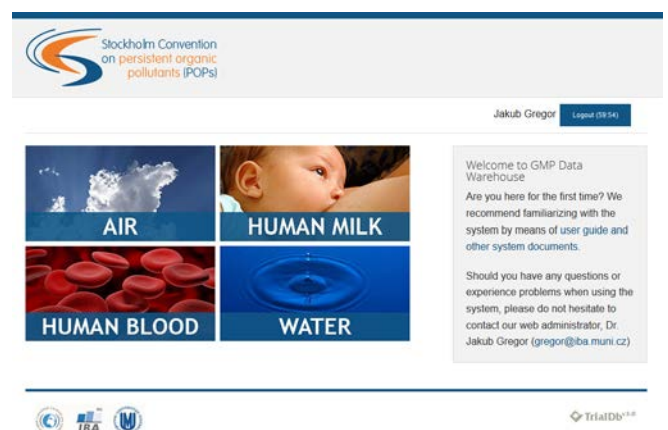
### New Project Supporting the Implementation of the Stockholm Convention



Stockholm Convention Regional Centre  
for Capacity Building and Transfer of Technology  
in Central and Eastern European Countries

The Stockholm Convention Regional Centre hosted at RECETOX is happy to announce that it was successful in the Small Grant Projects call for a six-month long project in 2014. The project entitled “Enhancing the use of the Global Monitoring Plan (GMP) electronic tool and increasing global data management and use” is aimed at supporting the implementation of projects (the second phase, supported by the Global Environmental Facility (GEF)) for capacity building to manage persistent organic pollutants in Africa, Asia-Pacific and Latin America.

The project will provide training materials to build capacity to work with data generated through monitoring/data collection projects, improve the use of information generated through capacity-building projects and short/long term monitoring projects, in particular for data on POPs levels, for the purposes of the implementation of Articles 15 and 16 of the Stockholm Convention on Persistent Organic Pollutants.



The RECETOX Centre will therefore prepare a series of webinars for each geographic region to enhance the use of the Global Monitoring Plan (GMP) electronic data warehouse to fill the gaps in global data coverage on POPs by attracting data owners/providers to publish already available information.

## RECETOX Activities Abroad

### Cycling of Persistent Organic Pollutants in the Monsoon

The levels of aerosols and a number of organic trace substances, namely polycyclic aromatic hydrocarbons and legacy persistent organic pollutants (such as many chlorinated pesticides, polychlorinated biphenyls, and polybrominated biphenyls), in the supposedly very clean background air of southern Asia and the Indian Ocean are the focus of a joint field campaign by the Max Planck Institute for Chemistry, Mainz, Germany (MPIC), the Indian Institute of Technology (IIT), Chennai, and the RECETOX Centre.

“The sampling takes place in the Western Ghats, southern India and the campaign studies the effect of the monsoon (wash-out and transfer into soil) on concentrations of studied contaminants and the atmospheric aerosol. These pollutants were hardly ever addressed in the atmospheric environment of this region” says Professor Gerhard Lammel, leader of the project.

The long-range transport and atmospheric cycling of slowly degradable and semi-volatile organic substances is a particularly complex issue as it includes multiple air-surface ex-

change and transport in air (multi-hopping), and ubiquitous distribution in the global environment. Many persistent organic pollutants are of concern as they are carried in the atmosphere, absorbed by lipid phases, concentrated along food chains and can reach harmful levels in wildlife and humans. During the season the easterly trade winds over the Indian Ocean bend into the Arabian Sea and then north-eastward towards southern India. The Western Ghats mountainous area and the coastal strip below are the first to receive the southwest monsoon in early June.

The measurement site, a college hosted by IIT located above the town of Munnar, is located close to a ridge at 1600 m altitude, looking out to the west and southwest, surrounded by tea gardens, deciduous forest and shrub. Since early May and until the onset of the monsoon the joint team of scientists from IIT, MPIC, and RECETOX are running on-line measurements and collecting samples of air, rainwater and soil for subsequent off-line chemical analyses in RECETOX.







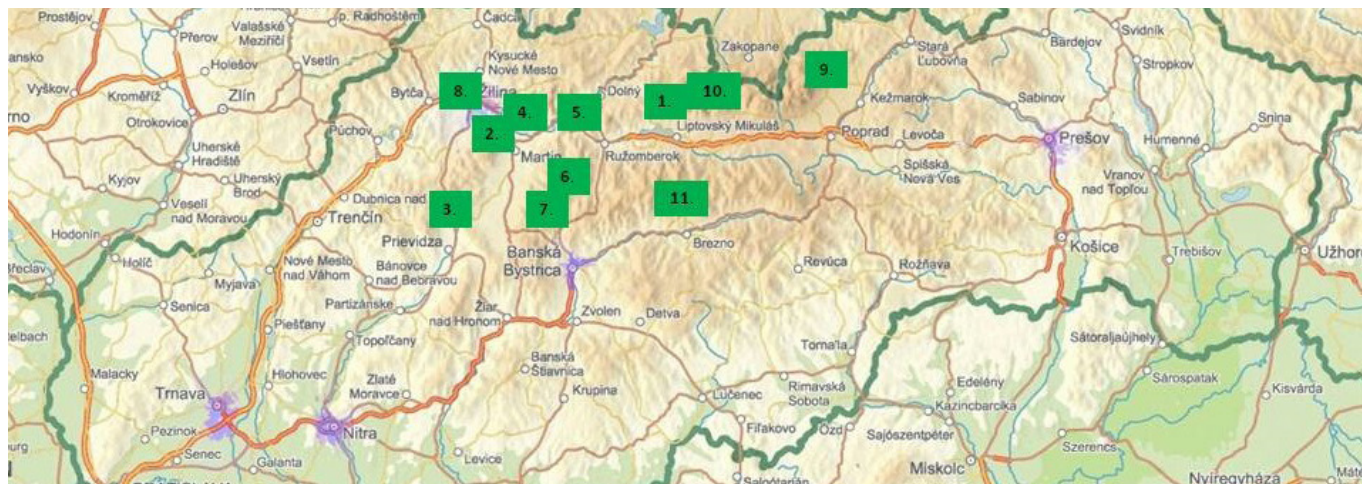
## NeedleNET Project

A new cooperation between the Czech Republic and Slovakia has been initiated through a NeedleNet project in 2014. The RECETOX Centre will coordinate the project with its partner, Výskumný ústav vysokohorskej biológie (Research Institute of High Alpine Biology) based in the Tatranská Javorina in the High Tatras, Slovakia. The Needle-Net project is supported from the Operational Programme of Cross-border Cooperation between the two countries.

The objective of the project is design and validation of methods for determining the contamination of air using the needles of mountain pine (*Pinus mugo*) and Scots pine (*Pinus*

*sylvestris*), as well as screening of persistent organic pollutant and heavy metal contamination in selected localities of the Great Fatra, Mala Fatra and the High and Low Tatras in Slovakia.

In addition, the project also aims to determine the genotoxic potential of pollutants (through pollen grain abortivity tests) for selected plant species. Finally, the significance of long-range transport of the studied contaminants from neighbouring countries (Czech Republic and Poland) on their environmental occurrence will be evaluated.





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- Sampling by active and passive samplers
- Sampling of precipitation and surface waters, sediments, soils and biotic materials

**Capacity building** – made to measure training for laboratory experts on various instrumentation

Contact Dr. Petra Příbylová ([pribylova@recetox.muni.cz](mailto:pribylova@recetox.muni.cz)) for more information.



**RECETOX research infrastructure provides OPEN-ACCESS to Czech and international researchers to work on their projects and use the expertise and instrumentation available in our Centre.**

Visit [www.recetox.muni.cz/RI](http://www.recetox.muni.cz/RI) for the application procedure.

For more information, please contact Dr. Petra Růžičková, infrastructure coordinator ([ruzickova@recetox.muni.cz](mailto:ruzickova@recetox.muni.cz)).



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