

# RECETOX NEWS

volume VII, issue 1/2019, spring 2019

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

## In this issue

### Calendar of Events

- 7–9 January** 2019 Introduction to Epidemiological Research Methods Workshop, RECETOX, Brno
- 10–11 January** 2019 HERA project Kick off Meeting, Paris, France
- 15–18 January** 2019 Fostering Synergies – Serbian Study Tour, Prague and Brno
- 26 and 29 January** 2019 Open door Days, RECETOX and Faculty of Science
- 28–31 January** 2019 national round of the Chemical Olympics, Brno
- 12–14 February** 2019 Expert meeting for POPs monitoring capacity building projects, RECETOX, Brno
- 20 February** 2019 Ostrava Declaration National Portfolio WG meeting, Prague
- 23 February** 2019 Bioskop Academy for students, Brno
- 23 March** 2019 Open Door Day National Observatory Košetice, Czech Republic
- 26–28 March** 2019, CEE regional consultations prior Basel, Rotterdam and Stockholm Conventions, RECETOX, Brno
- 2–4 April** 2019 SAICM OEWG3, Montevideo, Uruguay
- 8–12 April** 2019 Ad hoc Expert Group on Effectiveness Evaluation of the Minamata Convention, Geneva, Switzerland
- 16–17 April** 2019 Conference Ozduší 2019 (Air 2019), hotel Santon, Brno
- 23–24 April** 2019 Summer School at NUFT, Kiev, Ukraine
- 29 April–10 May** 2019, joint meeting of the Basel, Rotterdam and Stockholm Conventions, CICG, Geneva, Switzerland
- 11 May** 2019 MjUNI at RECETOX (Junior University at RECETOX)
- 26–30 May** 2019, 29th Meeting SETAC, Helsinki, Finland
- 17–21 June** 2019, 15th RECETOX International Summer School, RECETOX, Brno

## Horizon 2020 project HERA

### CELSPAC study taking-off

### RECETOX Research Infrastructure 2018

### Activities of the Stockholm Convention Regional Centre

## Editorial

### Welcome to the spring issue of the RECETOX newsletter,

All RECETOX staff witness the progress in the construction of our new bio-banking facility that emerges (or better is currently being dug) beneath our windows these days while participating in many events related to the 100th anniversary of the Masaryk University and preparing for new study programs that will welcome first students in September 2019.

This spring gives birth to the Young Adults study starting in March this year, and continues the traditions with the 14th Czech-Slovak conference Ozduší 2019 (Air 2019) held bi-annually in April and with 15th year of the RECETOX international summer school organized in June.

In addition, we are also introducing our new Horizon 2020 projects linking environment and health research – HERA – and giving you a summary of the use of our research infrastructure in 2018.

Last but not least, this is an invitation to read more about our past research activities abroad, published results and meetings organized at RECETOX by the Stockholm Convention Regional Centre.

I wish you a nice reading of this issue,

**Katka Šebková**  
on behalf of the editors

PS – 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). It is published in English and Czech. The next issue will be published in June 2019.



**RECETOX stands for a REsearch Centre for TOXic Compounds in the Environment, an independent university department operating within the Faculty of Science, Masaryk University, Brno, Czech Republic. The RECETOX fulfills three roles: an academic institution providing university education, a research institution working on transformation of environment and health research findings into practical applications and a body supporting the implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) and sound chemicals management in general as well as the science to policy dialogue, nationally and internationally.**

# RECETOX – research, projects and cooperation

## New Horizon 2020 project: HERA



The Integrating Environment and Health Research: a Vision for the EU (HERA) Horizon 2020 is a 36 month project launched in January 2019. It involves 22 partners from 15 EU countries (including the Czech Republic), and the World Health Organization and HEAL as partners. The HERA project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 825417.

The target of HERA is to set the priorities for environment and health research in Europe for next decade 2020-2030 by establishing or strengthening communication with and among stakeholder networks in environment and health, by building on the various European research activities in the environment and health and on policy needs and knowledge gaps in health, environment and climate and ecosystem quality.

HERA aims at international research cooperation and will carry out national, regional, and European consultations as well as will involve relevant international actors such as World Health Organization and United Nations Environment Program and other international organizations to address environment, ecosystem quality, climate and health research needs and gaps including those experienced by practitioners and countries with different research capacities.

HERA will encourage development of targeted transdisciplinary research on the basis of research gaps for major environmental exposures of humans and ecosystems and major drivers of changes in environmental exposures and policy needs integrating environment, ecosystem quality and health research.

Work progress will be continuously shared with scientific community, policymakers, the public and other relevant stakeholders on the HERA2030 website and on social media, in environment and health scientific and policy meetings and conferences.

The RECETOX is involved in the various components of this project, such as the stakeholder identification and communication nationally, regionally and globally, exploring linkages between environment, health, climate and ecosystems, identification of the knowledge gaps and prioritization in transdisciplinary research and in communication and dissemination activities of the project.

Follow us at [HERAresearchEU.eu!](https://HERAresearchEU.eu/)

## RECETOX Infrastructure Use in 2018

Large research infrastructures provide unique environment for research and science to external users and stimulate research and innovations. The infrastructures make available technologically and financially intensive new facilities, laboratories, and share large-capacity sources, measurements or other outputs.

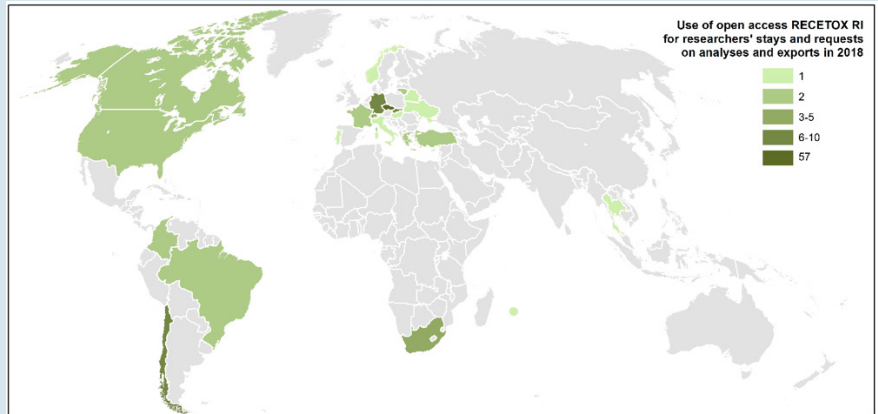
The RECETOX Research Infrastructure (RRI) provides open access to its three core facilities, to external and internal researchers and experts from around the world since 2010. The interested may apply for the laboratory capacity and come in person; they may also use the full service of the Trace Analytical Laboratories in sampling and data analysis or request a remote access to available data. All received project proposals for open-access to the RRI in 2018 were evaluated quarterly in a transparent two-stage process. In total, 152 requests for open access to RRI facilities were filed in 2018. These requests were evaluated individually based on the possible scientific impact as well as time and cost/resource intensity.

The access was granted to 78% of applicants – 118 requests approved represent a total of 855 man-days, and more than 9000 analyses. Trace Analytical Laboratories and monitoring networks hosted 51% of users. Another 38% worked with the environmental databases and 11% to the epidemiological data use. In addition, 39 external researchers (28 of them were international researchers) worked or were trained in-house within the open access to the RECETOX infrastructure (representing a total of 43 man-months of stay). Over the same period, 79 scientists/institutions used RI capacities for sample and/or data analysis.

Further, 480 participants attended 13 conferences, workshops and summer

schools co/organized by the RI, of which were 7 international and there were another 25 awareness raising and educational events that attracted more than 4400 participants. Overall, there were almost 5000 users of the RECEPTOX research infrastructure in 2018.

Moreover, the RRI went through an international evaluation by the Scientific and Advisory Board in May 2018, submitted two large development project proposals in the international calls and successfully concluded a memorandum of understanding with the city of Brno on environmental research aimed at improving the health of its inhabitants.



## CELSPAC: Young Adults study walks in



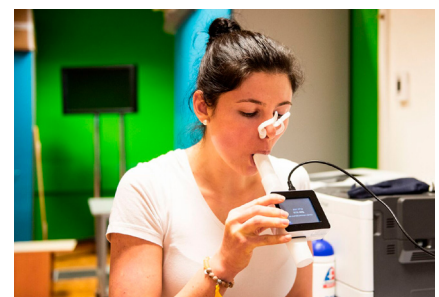
Most epidemiological studies have focused their attention either on early development of children or investigated health of the elderly populations. Young adults age group therefore are much less studied, however this age may see outbursts of diseases with an unclear ethnology (i.e. various types of auto-immunity disorders). Such diseases may be to a great extent caused by a long term exposure to risk factors, not just to the environment.

Parents of the ELSPAC children, and later on the children themselves, have completed many questionnaires that yielded a large set of interesting datasets on their health as well as on factors that they have been exposed to during the course of their lives. We would like to link that information with new data sets and therefore we are establishing the Young Adults study. The new data will not be generated through questionnaires, but rather through



blood, urine or saliva takes that will help the researchers to build a whole picture composed of information generated for over more than two decades and will ground the future research. The participants in the Young Adults survey will also undertake examination of their physical condition and will get individual results themselves. Planned examinations such as body composition tests by DEXA (dual X-ray absorptiometry), dynamometrics, status of the foot bones, spirometry or anthropometry will be performed in our modern laboratories in the Bohunice University campus in cooperation with the Faculty of Sport Studies expert teams.

The first appointments will start in the mid-March 2019 and will continue at least until end of the year. All interested ELSPAC children, their siblings or partners can register or ask for an appointment by contacting us by e-mail at [info@celspac.cz](mailto:info@celspac.cz)



## Molecular Gating of an Engineered Enzyme in JACS 2018

Research teams of Masaryk University and Heyrovský Institute of Physical Chemistry have worked for six years on mechanisms that can improve the efficiency of enzymes. They now demonstrated a new prospective way for biocatalyst design and engineering through engineered dynamical molecular gates. Lead author of the paper just published in the Journal of the American Chemical Society, Piia Kokkonen of the Protein Engineering Group at RECETOX explained: "We have focused on the transport paths whose shape and dynamics influence which molecules can get in or out, thus changing the efficiency of enzymes. We demonstrated molecular gating at single molecule level in the real-time". According to Kokkonen, research results can be potentially

applied in biomedicine for preparation of pharmaceuticals or in the decontamination of the environment.

See more at: Kokkonen, P., Sykora, J., Prokop, Z., Ghose, A., Bednar, D., Amaro, M., Beerens, K., Bidmanova, S., Slanska, M., Brezovsky, J., Damborsky, J., Hof, M., 2018: Molecular Gating of an Engineered Enzyme Captured in Real Time. Journal of the American Chemical Society 140: 17999–18008.

## Invitation to Ovzduší 2019

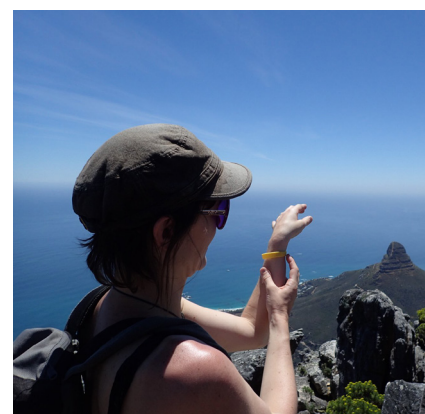
RECETOX Research Infrastructure organizes the 14th Czech-Slovak conference Ovzduší 2019 (Air 2019), which will be held at Hotel Santon in Brno, 16-17 April 2019. The conference focuses on the atmospheric pollution and its consequences from legal, environmental and health points of view. All stakeholders from research, practice, industry, academia as well as business managers and students keen on air protection are warmly welcome. For more information about the conference, visit the conference website ([www.recetox.muni.cz/index.php?pg=odborne-akce--ovzdusi-2019](http://www.recetox.muni.cz/index.php?pg=odborne-akce--ovzdusi-2019)).

## RECETOX Abroad

Two RECETOX researchers went for a sampling campaign in South Africa in October-November 2018 to assess the exposure to pesticides of children living in the Western Cape. This study is part of a larger project implemented by Swiss TPH and the University of Cape Town involving 1000 children.

Environmental monitoring was done with the collection of air, soil, deposition and dust samples characterizing

the environmental levels of pesticides outdoor and at the household level. Spray records from local farmers were also obtained. Meanwhile, the exposure of 40 children, wearing a silicone wristband and a GPS, was assessed through deep questionnaires, and urine samples were collected on a daily basis. Significant part of the collected samples will be analyzed at the Trace Analytical Laboratory.



# RECETOX in brief

This section provides brief information on papers, events and other issues relating to RECETOX.

## New RECETOX Structure, Rules and e-mails

In line with the Teaming project phase 1, the RECETOX made changes in its management and organizational structure which came into effect in early January 2019. New set of rules and structure in Czech were available by end of December 2018, but the English version became available by end of February 2019.

Please note the upcoming change in the e-mail addresses that will involve a longer alias - name and surname separated by a dot. This change will be gradually introduced during spring 2019 for all the RECETOX staff. The existing e-mails addresses will not be terminated, but will temporarily co-exist with the new ones. Any change will be announced in the due time.

## New Logo

In line with the rebranding of the Masaryk University for the 100th anniversary, massive changes are taking place at the levels of faculties and institutes as well. As of early 2019, the RECETOX changed its name - it is not the long version of the Research Centre for Toxic Compounds in the Environment anymore, but "just" RECETOX and we also have a new logo featuring both the university abbreviation, faculty (where applicable) and our name and a specific blue tone. Basic rules on the use of the RECETOX logo and its versions are available on the RECETOX intranet/ sharepoint.

MUNI | RECETOX

## Use the RECETOX research infrastructure capacity!

RECETOX research infrastructure provides open access (free of charge) to Czech and international researchers and experts to work on their projects and use the expertise and instrumentation available in our Centre.

Please note the following deadlines for submitting application forms or project proposals in 2019: **31 March, 30 June, 30 September, and 31 December.**

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

Should you have additional questions, please contact Petra Růžicková, coordinator of the RECETOX research infrastructure ([ruzickova@recetox.muni.cz](mailto:ruzickova@recetox.muni.cz))

## New projects at RECETOX

Since October 2018, there are 25 new projects that are granted to RECETOX from various sources. For example, there is a MSCA-IF project of Dr. Garry Codling and prof. Jana Klánová, two Horizon 2020 projects, one Mobility Austria project, five Czech Science Foundation Standard projects and two Junior projects, one Technology Agency of the Czech Republic (TAČR) epsilon project and a TAČR zéta, two projects from AZV (applied and fundamental health research agency) and two ZEMĚ projects, three projects from Masaryk University Grant agency (GAMU) and five other projects funded by Masaryk university specific research and development envelopes. In addition, there were 20 projects submitted and for 10 of those the results of evaluation are not yet disclosed

## Studying at RECETOX in 2019

The application procedure for new study programs of the Masaryk University - Environment and Health and Computational Biology and Biomedicine - was launched in November 2018. A number of events and information days were organized by our teams - to bring these new programs and majors to the attention of students. There were 26 lectures of our researchers at secondary schools in the Czech and Slovak Republics and 14 excursions of

interested students at RECETOX and we have reached more than 1000 students. At the application deadline, the Masaryk University information system revealed that there are 124 filed applications for Environment and Health and 116 applications for Computational Biology and Biomedicine which is a great success.

Special open day for applicants to these two programs will be organized on 5 and 6 April 2019 and more information will be provided on our website and facebook.

## Awards to RECETOX Students

Two of our PhD students received a the PhD. Talent contest award in February 2019. Congratulations to Mr. Erik Mravec (from our Microbiom team) and Mr. Martin Toul (Protein Engineering group) who won a three year scholarship supporting their research!



## RECETOX Publications 2019

In 2019, the RECETOX researchers published 26 articles in the peer reviewed literature so far. A selection of six articles below covers the breadth of our research until early March 2019:

Bajard, L.; Melymuk, L.; Blaha, L. Prioritization of hazards of novel flame retardants using the mechanistic toxicology information from ToxCast and Adverse Outcome Pathways. *Environmental Sciences Europe* (2019), 13, Article Number: 14.

Hale, S. E.; Skulcova, L.; Pipal, M.; Cornelissen, G.; Oen, A. M. P.; Eek, E.; Bielska, L. Monitoring wastewater discharge from the oil and gas industry using passive sampling and Danio rerio bioassay as complimentary tools. *Chemosphere* (2019), 216, 404-412.

Jindal, G.; Slanska, K.; Kolev, V.; Damborsky, J.; Prokop, Z.; Warshel, A. Exploring the challenges of computational enzyme design by rebuilding the active site of a dehalogenase. *Proceedings of the National Academy of Sciences of the United States of America* (2019), 116 (2), 389-394.

Sharma, B. M.; Becanova, J.; Scherlinger, M.; Sharma, A.; Bharat, G. K.; Whitehead, P. G.; Klanova, J.; Nizzetto, L. Health and ecological risk assessment of emerging contaminants (pharmaceuticals, personal care products, and artificial sweeteners) in surface and groundwater (drinking water) in the Ganges River Basin, India. *Science of The Total Environment* (2019), 646, 1459-1467.

Vidova, V.; Stuchlikova, E.; Vrbova, M.; Almasi, M.; Klanova, J.; Thon, V.; Spacil, Z. Multiplex Assay for Quantification of Acute Phase Proteins and Immunoglobulin A in Dried Blood Spots. *Journal of Proteome Research* (2019), 18 (1), 380-391.

Neuwirthova, N.; Trojan, M.; Svobodova, M.; Vasickova, J.; Simek, Z.; Hofman, J.; Bielska, L. Pesticide residues remaining in soils from previous growing season(s) - Can they accumulate in non-target organisms and contaminate the food web? *Science of The Total Environment* (2019), 646, 1056-1062.

# Activities of the Stockholm Convention Regional Centre in the Czech Republic

The Stockholm Convention Regional Centre in the Czech Republic (SCRC) hosted at RECETOX continues to provide support to other countries and regions, in particular in relation to monitoring, sampling and analyses of toxic chemicals in the environment and biota by providing capacity building projects and trainings. In addition, it supports development of the legal and institutional frameworks as well as generates data in monitoring program MONET and operates the global POPs data visualization portal [www.pops-gmp.org](http://www.pops-gmp.org).

## Exploring Synergies – support provided to Serbia

SCRC CZ organized a four day study visit including a course of lectures in the Czech Republic on synergistic approach to the Basel, Rotterdam, Stockholm and Minamata Conventions at the national level for five representatives of the Ministry of Environment Protection of Serbia. The Serbian delegation was composed of the national focal points of the conventions and SAICM. The goal of the course entitled “Exploring synergies and fostering national implementation” was to share Czech experience of the Czech national focal points of the each convention on their day to day work for each convention as well as challenges they experience nationally. In addition, opportunities of the national coordination and inter ministerial cooperation were explored with a view to identify elements that could be transposed to Serbian circumstances and support them in efforts of enhanced national cooperation and cooperation. The course took place in the Ministry of the Environment in Prague and also at RECETOX in Brno 15–18 January 2019.

Serbian colleagues have noted that experience and way of management in the Czech Republic is very useful and identified many similarities between both countries. They appreciated in particular the national coordination mechanism bringing to the table all relevant ministries and existence of the national centre for toxic compounds

(RECETOX) providing a technical and scientific support including exposure to chemicals and monitors levels of target chemicals in the environmental matrices, biota and humans. A close cooperation fostering the link between the health and environmental issues was emphasized and the National Portfolio for Health and Environment (supporting implementation of the Ostrava Declaration) were identified as useful tool for enhancing health and environment cooperation. Serbia will organize their national workshop on synergies in February 2019.



## Consultations on future needs for capacity building for POPs monitoring

A consultation meeting for the sustainable monitoring of POPs under the Stockholm Convention was held at RECETOX, University Campus in Brno, Czech Republic on 12-14 February 2019. There were representatives of UN Environment, BRS Secretariat, capacity building projects partner laboratories and members of the Global Coordination Group from Africa, Asia and Pacific and GRULAC regions. The meeting focused on fact review of achievements of the conducted capacity building projects for POPs monitoring from 2008 onwards in 42 project countries. On the basis of the experience gained

during the implementation of the above mentioned capacity building projects over last 15 years and with a view of the future sustainability of POPs monitoring, the experts identified a set of POPs monitoring activities and propose critical elements that would be instrumental for sustainable monitoring of POPs in the project countries in the future beyond the ongoing GEF GMP2 projects. These outcomes will be presented as an information document made available for the upcoming joint COPs meeting in Geneva in early May 2019.



## SCRC Events in the Pipeline

A CEE regional meeting prior triple-COPs is organized in the hotel Continental, Brno, Czech Republic 26-28 March 2019. There are 20 countries of the Central and Eastern Europe and Central Asia registered for the meeting making it a total of 55 participants. There will also be 3 regional centres operating in the CEE region, GEF representative as well as several international organizations and civil society representatives.

SCRC CZ supports an organization of a spring-summer school at National University of Food Technology in Kiev, Ukraine that will take place 23-24 April 2019. Topic of the summer school is European sustainability and it will be held in Ukrainian and English.

The RECETOX will have a stand at the joint BRS COPs at the Information Fair 2-4 May 2019 and will also organize a side event on 1 May 2019 on 15 years in building capacities for POPs monitoring and share thinking on sustainability of POPs monitoring.

15th RECETOX international summer school will take place 17-21 June 2019 and it will focus on summer school will focus on human biomonitoring and risk assessment and will take place at RECETOX premises in Brno 17-21 June 2019. The training course is held in English only and it can also provide credits, if needed (i.e. to students at the Summer School will be credited with 4 ECTS credits for theoretical part and 4 ECTS credits for practical exercises). Up to four scholarships will be available to a limited number of the participants from non-EU CEE countries. Interested candidates are kindly asked to their motivation letters and brief CV to Katerina Sebkova by 1 April 2019.