

Editorial

By Hans Løkke, NoMiracle project co-ordinator

More than 100,000 man-made chemicals are present in society together with natural compounds of which some are highly toxic. All these compounds can combine with natural stressors such as climate, pathogens, anoxia etc. to produce complex environmental and health effects.

For scientists and for regulators, there is no simple solution to the problem that the interactions between mixtures of chemicals and combinations of stress and fate conditions produce a nearly infinite set of possible scenarios.

NoMiracle seeks to develop **Novel Methods** for **Integrated Risk Assessment of Cumulative stressors**, in Europe and beyond. Within the NoMiracle project we will improve both human and environmental risk assessment procedures by addressing major shortcomings that exist within the current approaches, namely that:

1. they are based on direct effects of single compounds or products
2. they apply uncertainty factors which are not strictly based on scientific principles
3. they do not account for multiple stressors and indirect effects in a dynamic and heterogeneous environment
4. they typically do not account for cumulative effects (integrated over time, space, substances), and
5. they do not allow for site specific and other spatially detailed evaluations.

Although it is generally acknowledged that chemical, biological, radiological, and other physical and even psychological stressors can cause a variety of human health or ecological health effects, assessing the risks associated with them is considerably more complex methodologically and computationally than current risk assessment practices. NoMiracle follows two tracks to improve risk assessment: a top-down procedure, identifying chemicals with potential high risk and "hot spots" with high risk potential, and a bottom-up procedure, developing methods based on mechanistic understanding of the interaction between chemicals on biological targets by use of model compounds.

In our Newsletter No. 6, released on 22 February, selected NoMiracle authors presented results from Year 2. In this issue of the Newsletter these authors reflect on how their research will solve some of the risk assessment methodological problems, and how NoMiracle research can one day help decision makers and regulators.

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Author reflections

By Claire Mays and Hans Løkke (eds)



Interview with Peter Sørensen about the significance of his research in multicriteria risk assessment methods described in NoMiracle Newsletter No. 2.

Why is your (type of) research needed for the regulation of chemicals?

Peter Sørensen - In the regulation of chemicals a key topic is to ensure that a harmful chemical is not wrongly assessed to be harmless by the risk assessment methodologies. This involves application of precaution in the risk assessment where the level or degree of precaution is a matter of judgment. There will always be some uncertainty related to the risk prediction and this will make the level of precaution highly critical for the result. If an extremely high level of precaution is undertaken then many harmless chemicals can be assessed as harmful and this will induce a hindrance for the industrial development.

If a low level of precaution is applied then there will be a high risk for harmful chemicals to pass the risk assessment as "harmless" and thus subsequently being produced and used and result in truly harmful effects. Both extremes are not wanted and the challenge is to make a clear and measurable definition of the level of precaution based on the uncertainty level on one side and the seriousness of the harmful effects on the other side. However, the complete level of uncertainty that takes into account the entire chain of assumptions governing the risk assessment is not fully understood in existing risk assessment methodologies. This is a critical obstacle for application of a well defined precaution level and the activities in Research Pillar 1 suggest a new approach that can solve central parts of this problem.

How will your research and its expected results benefit the EU administration in its regulation of chemicals?

Peter Sørensen - The methodology developed in the Research Pillar 1 is general and thus applicable in many places of regulation and policy, where identification of realistic worst case conditions for potential risk is needed. Especially in complex problems where the uncertainty is more than just variability check of parameters values.

How will your research be of benefit in the short term?

Peter Sørensen - The research can support a clear and well defined precaution definition of worst case for existing risk assessment activities.

In the long term?

Peter Sørensen - The developed methods are useful in the search for data gaps in understanding of risk levels and thus useful in design of future research and monitoring activities. The handling of uncertainty will also be more complete and the risk assessment conclusion thus more confident.



Interview with Bernd Münier about the significance of his research in risk scenarios described in NoMiracle Newsletter No. 6.

Why is your (type of) research needed for the regulation of chemicals?

Bernd Münier - In the regulation of chemicals, the use and places or areas of release of chemicals to the environment are very unevenly distributed throughout Europe and within each country.

Therefore, it is very important to assess the spatial pattern of these releases together with its interrelations to other stressors and potentially vulnerable ecosystems.

Integrated risk assessment has to be based upon large data sets, producing even more information on risks. Development of Geographical Information Systems allows for analysing these data, taking into account geography and spatial relationships. Current research outlines hotspot areas by producing release maps and combining them with maps of other stressors and of ecological vulnerable areas. Furthermore, the research has been utilized as part of a survey of expert opinions and interpretation of risk maps, carried out elsewhere in "Nomiracle".

How will your research and its expected results benefit the EU administration in its regulation of chemicals?

Bernd Münier - The development of novel methods for integrated risk mapping will further support stakeholder involvement in regulation of chemicals by better illustrating the geography of risk factors and integrated risks. The questionnaire has further outlined strengths and limitations of these dissemination techniques.

How will your research be of benefit in the short term?

Bernd Münier - Risk mapping will contribute to enhanced risk assessment and precaution of potential risks as well as to choose the right manner when promoting these risks to administrators and the general public.

In the long term?

Bernd Münier - Current research will contribute to targeting developments in GIS techniques and Web-based solutions to strengthen integrated risk assessment and risk visualisation, especially regarding the geographical dimension.



Interview with Martin Holmstrup about the significance of his research in interaction between natural stressors and environmental chemicals described in NoMiracle Newsletter No. 6.

Why is your (type of) research needed for the regulation of chemicals?

Martin Holmstrup - Sound methodologies to assess the effects of *cumulative stress* have been missing. Work in NoMiracle Workpackage 3.2 will address the effects of chemicals on organisms and humans when natural stressors (temperature, drought conditions...) also play a significant role. This field of research has been neglected until recently. We aim at developing the missing methods

for cumulative effects assessment, and thereby to provide a better basis for making a sensible risk assessment of chemicals.

How will your research and its expected results benefit the EU administration in its regulation of chemicals?

Martin Holmstrup - Our research will help reduce much of the uncertainty presently found in risk assessment of chemicals: Does combined stress of several compounds, or mixtures of natural

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stress and toxic stress, result in effects higher than expected by simple addition of effects? No matter what the answer is, this knowledge will provide a better basis for the setting and application of safety factors. The findings will also be of relevance for the EU Thematic Strategy on the Sustainable Use of Pesticides and REACH.

How will your research be of benefit in the short term?

Martin Holmstrup - It will contribute to the state-of-the-art of environmental sciences such as ecotoxicology and human health disciplines.

A broad understanding of how toxicants interact with natural stress will be gained.

In the long term?

Martin Holmstrup - It will help identify in which geographical areas – both on a local scale and a European scale – environmental chemicals may be of greatest concern. And probably just as important: where they will be of minor concern. It will also help predict how manmade pollution will influence nature and human health in the changing climate we are facing

Interview with Oliver Jones and Julian Griffin about the significance of their research in the use of metabolomics in assessing the non-lethal effects of environmental pollution described in NoMiracle Newsletter No. 6.

Why is your (type of) research needed for the regulation of chemicals?

Oliver Jones - In the modern world chemicals have become vital for both health and economic development. However, these substances can also have adverse effects on both wildlife and people. Therefore if the use of chemicals is to be economical and sustainable it is essential that the risks associated with their manufacture, use and disposal are subject to detailed scientific assessment.

How will your research and its expected results benefit the EU administration in its regulation of chemicals?

Julian Griffin - Historically, the focus of most research on chemical pollution has been on single compounds. This approach has been critical in providing a better understanding of the effects of exposure and improving risk assessment. Nevertheless, organisms in the environment are not normally exposed to only single chemicals and therefore knowledge of individual chemical toxicity is inadequate for full risk assessment.

Oliver Jones - The metabolomic work currently being undertaken within the NoMiracle project will be of benefit to EU chemical policy because



it offers the potential to detect effects occurring at the biochemical level, which may be detrimental to the health of an organism without manifesting obvious outward effects.

How will your research be of benefit in the short term/long term?

Julian Griffin - The research will be of benefit in the short term in that we will gain a better understanding of the biochemical effects of exposure to sublethal levels of pollutants. The mechanistic information that can be gained from metabolomic profiling may allow us to look for unexpected modes of action and interaction for single chemicals and mixtures.

In the long term the benefits of this work (in conjunction with the other research being carried out within the NoMiracle project) will be in assisting in the development of appropriate chemical assessment and mitigation strategies and the formulation of effective policies to protect environmental health. This may be especially useful for the upcoming EU regulations such as REACH, which will require extremely detailed assessment of the effects of chemicals before they can be licensed.



Interview with Bas Kooijman and Jan Baas about the significance of their research in modelling effects of mixtures of compounds described in NoMiracle Newsletter No. 6.

Why is your (type of) research needed for the regulation of chemicals?

Jan Baas - The classical way of dealing with (mostly binary) mixtures is to use one of two existing reference models (concentration or response addition) and look for deviations (synergism or antagonism) from the reference model at a specific point in time. These models are descriptive in nature and lack a mechanistic basis. As a result, the choice of a reference model, and therefore the interpretation of interactions, is not straightforward. In addition, we have shown that the apparent interactions strongly depend on exposure time, and therefore, interpreting an interaction at one specific point in time is a challenge.

Bas Kooijman - These problems may be avoided when using biology-based models, which are based on Dynamic Energy Budget theory for metabolic organization. Biology-based models make explicit assumptions regarding the processes behind the toxic effect and allow for the simultaneous analysis of different toxicological endpoints. This approach explicitly includes exposure time in the analysis and uses all the results from all time points to estimate model parameters, such as no-effect concentrations; classic methods typically use the data of the largest exposure time only, ignoring the changes of effects in time.

How will your research and its expected results benefit the EU administration in its regulation of chemicals?

Bas Kooijman - The development of novel methods for mixture toxicity allows for a mechanistic interpretation of the data, which facilitates the translation of effects observed in one species of organism to that in another, and (under certain restrictions) to predict toxicity of a chemical from a known toxicity of a related chemical and to extrapolate from effects observed on individuals to that on populations. Environmental risk assessment typically suffers from lack of knowledge and can use methods to fill gaps in knowledge very well.

How will your research be of benefit in the short term? In the long term?

Jan Baas - In the short term the research can help scientists to shift paradigm for studying and assign mixture toxicity within ecotoxicology and also within human toxicology based on non-mammal testing. The quantifiers of toxicity in biology-based models are independent of exposure time, contrary to e.g. EC_x values or apparent interactions of chemicals in a mixture as resulting from classic methods. This makes the results of biology-based methods easier to use in environmental risk assessment; there is no need to choose between independent action or concentration addition in biology-based methods. Later on, today's research will contribute to targeting developments in mixture toxicity based on sound mechanistic and theoretically well-founded approaches.



Interview with Uwe Schlink about the significance of his research in modelling, assessing and ranking of spatial and individual risks for human health described in NoMiracle Newsletter No. 6.

Why is your (type of) research needed for the regulation of chemicals?

Uwe Schlink - The NoMiracle project aims at developing novel methods for an integrated risk assessment, especially for cumulative stressors. For human health, this requires qualified model-

ling approaches, which are able to disentangle the cumulative effect of the variety of stressors that can be observed, for example, in epidemiological studies with children. A ranking of risk factors, especially chemicals, according to their importance helps to put preventive measures into praxis.

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The research work takes into account the properties of spatial data, such as spatial autocorrelation, heterogeneities in the spatial distribution, etc., thereby enhancing the explanatory power and the statistical confidence of the results. This provides a sound basis for the specification of regulatory measures.

How will your research and its expected results benefit the EU administration in its regulation of chemicals?

Uwe Schlink - The results of our research can help in the establishment of novel European Commission directives on the protection of human health, including the specification of risk factors and their threshold levels.

For example, allergic ailments have a strong association with environmental conditions. An important step is the identification and assessment of relevant risk factors, a task that demands for a model of cumulative stressors, as complex as possible. Our modelling work is essentially facilitated by the epidemiological studies performed at the UFZ.

Furthermore, the findings are important for the following fields: The European Environmental and Health Action Plan (Action No. 7), Thematic Strategy on the Sustainable Use of Pesticides and REACH.

How will your research be of benefit in the short term?

Uwe Schlink - It will contribute to the scientific literature and the understanding of environmentally related human diseases that are a major burden to people living in Europe. Hot spots of risks can be identified and potential (currently unknown) sources of stressors may be discovered.

In the long term?

Uwe Schlink - It may facilitate the prevention and treatment of environmentally related illnesses and an orientation and extension of the sustainability discussion to human health problems. Understanding the complex and cumulative causes of environmental diseases will lead to scientifically based decisions for their prevention.



Interview with Philipp Mayer about the significance of his research in availability and exposure of hydrophobic organics described in NoMiracle Newsletter No. 6.

Why is your (type of) research needed for the regulation of chemicals?

Philipp Mayer - The exposure assessment of hydrophobic organic substances is complicated by their extended sorption within various environmental matrices such as soil and sediment. Our research aims at providing new analytical techniques to measure the available exposure of hydrophobic organics within the (human) environment. Additionally, the effect assessment of these substances is complicated by their limited solubility in aquatic toxicity tests and their tendency to escape from the freely dissolved form. Therefore, we also aim at providing new approaches to make the exposure of these substances in toxicity tests better controlled and also better defined.

Our current findings suggest (1) that the bio-availability of hydrophobic organics needs to be

parameterized into chemical activity and accessibility, (2) that chemical activity can be measured with equilibrium sampling devices and be controlled with passive dosing techniques, (3) that several hydrophobic organics, which do not exert toxicity as individual substances still will contribute to the toxicity of complex mixtures and (4) that the diffusive uptake of hydrophobic organics in certain exposure scenarios can be enhanced by for instance surfactant micelles and humic acids.

How will your research and its expected results benefit the EU administration in its regulation of chemicals?

Philipp Mayer - The results of our research can help in the establishment of novel European Commission directives on the protection of human health and the environment. Furthermore, the findings are important for the Strategy for Soil Protection and REACH

How will your research be of benefit in the short term?

Philipp Mayer - Our research will contribute to the scientific literature, it will provide operational concepts and analytical tools to determine the exposure of hydrophobic organics in for example soil and sediment, and it will hopefully improve the quality of toxicity data due to a better controlled and better defined exposure in the toxicity tests.

In the long term?

Philipp Mayer - Our research will improve the site specific risk assessment of polluted soils and sediments and will thus help the European

societies to prioritise their efforts with regards to the remediation of the very large number of polluted sites. The research will provide new tools to remediation managers to predict and optimize remediation. Finally, it will improve the quality of toxicity test data, and might also help to reduce the number of needed tests.

Interview with Alberto Pistocchi about the significance of his research in geographically based chemical fate models for Europe described in NoMiracle Newsletter No. 6.



Why is your (type of) research needed for the regulation of chemicals?

Alberto Pistocchi - Risk assessment of chemicals so far refers to a “generic” environment and aims at providing answers to the question “which chemicals pose bigger threats to humans?” However, we also need to take into account the “real” environmental, landscape and climate features of different parts of Europe as well as the spatial distribution of population and ecosystems. Within NoMiracle, our methodological research aims at defining a way to produce reliable maps that answer the question “where risk is likely to be relatively higher in Europe?”

How will your research and its expected results benefit the EU administration in its regulation of chemicals?

Alberto Pistocchi - The availability of maps on the relative importance of chemical contamination will allow identifying “hot spots” which can trigger specific policy response. In the future, policy makers might take into consideration the possibility of spatially differentiated measures based on actual landscape, climate, population and emissions. Also, the spatial distribution of risk allows to assess to which spatial extent “worst case risk scenarios”

correspond in Europe. This is particularly important in relation to the European Environmental and Health Action Plan (Action No. 7), the Thematic Strategy on the Sustainable Use of Pesticides, the Plant Protection Directive 91/414/EEC, the Biocide Directive 98/8/EEC, the Pharmaceutical directive, and the Strategy for Soil Protection.

How will your research be of benefit in the short term?

Alberto Pistocchi - It will contribute to the scientific literature and the understanding of environmental pollution patterns in Europe. It will allow formulating hypotheses of hot spots of high concentration of chemicals such as certain pesticides, pharmaceuticals and PBDEs, which are currently not studied in terms of large scale geographic patterns.

In the long term?

Alberto Pistocchi - It will help the scientific community to investigate phenomena of chemical pollution at a more refined geographically realistic level. In particular, it will allow looking at pollution dynamics with more attention for the environmental data increasingly available e.g. from remote sensing.

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RAISEBIO – AXIOM – NOMIRACLE – Summerschool:

“Chemicals in soil: interactions, availability and residue formation” 24. - 27.09.2007 in Leipzig
Scientific program and time schedule

Sunday, 23.09.07		
20.00	Early Arrivals Get together in the city (Moritzbastei, Tisch reservieren)	19.30 Meeting at Hotel IBIS
Monday, 24.09.07		
12.00-13.30	Arrival and registration	
13.30-14.00	Welcome	Brigitte Großer, UFZ Leipzig, Matthias Kästner, Raisbio, Hans Richnow, AXIOM Gerrit Schüürmann, NOMIRACLE, UFZ Leipzig
Session 1. Chemicals in environmental systems		
14.30-15.30	Overview, introduction, definitions	Joop Harmsen, ALTERRA/Wageningen Univ. (confirmed)
15:30-16:00	coffeebreak	
16.00-17.00	Thermodynamics of processes	Kai Uwe Goss, UFZ Leipzig (confirmed)
17.00-18:00	Schwermetalle or Isotopes.....	Jiang Zhang ?? Barbara Sherwood-Lollar
18:00-20.00	Reception at the poster corner/Introduction of Open Space discussions	
Tuesday, 25.09.01		
Session 2. Interactions		
9.00-10.10	Diffusion and Mass transfer	Philipp Mayer, NERI (confirmed)
10:10-10:30	coffeebreak	
10.30-11.40	Kinetics of diffusion	Jörg Kärgner, Univ. of Leipzig (confirmed)
11.40-13.00	Open space discussion, group work	
13.00-14.00	Lunch	
Session 3. Bio-availability		
14.00-15:10	Molecular entrapment	Joseph Pignatello, New Haven CT (confirmed)
15:10-15:30	coffeebreak	
15.30-16.40	Sorption to surfaces	Peter Grathwohl, Univ. of Tübingen (confirmed)
16:40-17.00	coffeebreak	
17.00-18:10	Assessment of Bioavailability	Kirk Semple, Univ. of Lancaster (confirmed)
18:10-19.30	Poster session, focus on posters (1-25)	



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Wednesday, 26.09.07		
Session 4. Compounds and solid state matrix		
9.00-10:10	Prediction methods for fate relevant properties organic compounds	Gerrit Schüürmann, UFZ (confirmed title)
10:10-10:30	coffeebreak	
10.30-11.40	Properties of solid state matrix or others	Wer? Kappler, Vogel, Martin Elsner
11:40-11:55	coffeebreak	
11:55-12.00	Official Spring School group foto in front of the KUBUS	
12.00-13.15	Open space discussion, group work	
13.15-14.00	Lunch	
Session 5. Water potential and reactive transport		
14.00-15:10	Properties of system, water matrix potential	Barth Smets, Danish Tech. Univ. (confirmed)
15:10-15:30	coffeebreak	
15:30-16:40	Properties of system, hydrodynamics, reactive transport	Kai Totsche, Univ. of Jena (confirmed)
16:40-17.00	coffeebreak	
17.00-18:30	Poster session, focus on posters 26-50	
20:00-.....	School Dinner (paid by us), Bayerischer Bahnhof, brewery visit	Poster prices
Thursday, 27.9.2007		
Session 6. Humic compounds and bioavailability		
9.00-10:10	Properties of system, humic substances	Alessandro Piccolo, Univ. of Napoli (confirmed)
10:10-10:30	coffeebreak	
10.30-11.40	Properties of system, bound residues	Peter Burauel, FZ Jülich (confirmed)
10:40-11:00	coffeebreak	
11:00-12:45	Outcomes of the groupwork/ Good bye words	Groups Organizing scientists
12:45- 13:30	Lunch	
	(End of Summerschool)	
Internal RAISEBIO meeting with the advisory board		
14:00-16:00	Presentations of PhD's, discussion with the supervisors	
16:00-16.30	coffeebreak	
16.30-18:00	Presentations of PhD's, discussion with the supervisors	

NoMiracle contributions at SETAC Porto, May 20–24, 2007



By Morten Strandberg, NoMiracle Secretariat

The presence of NoMiracle at the SETAC Europe Conference in Porto May 20–24, 2007 includes 18 platform presentations and 36 poster presentations (30 posters & 6 posters corner). The contributions cover results from investigations with a wide span of the organisms, compounds, environmental factors and methods employed in the NoMiracle project to fulfil the overall aim of developing and improving methods for combining human and environmental risk assessment. The tables below list the titles of the NoMiracle contributions and indicate where and when they are presented at the SETAC conference. Abstracts are available on the SETAC Homepage: <http://www.setac.org/>

Platform presentations

EC01A New analytical tools in environmental chemistry – D. Luis Hall			
Garcia Galan, M.J., Diaz-Cruz, M.S. & Barcelo, D.	Assessment of LC-MS and LC-tandem MS using QqQ and Q-Lit mass analysers in the determination of sulphonamide antimicrobial residues in environmental waters	EC01A-4	09:30-09:50 Monday, 21 May
EC01B New analytical tools in environmental chemistry – D. Luis Hall			
Legind, C.N.L.	Determining chemical activity of (semi)volatile compounds by head-space solid phase microextraction	EC01B-5	12:20-12:40 Monday, 21 May
EC02 Degradation and bioremediation of chemicals – D. Luis Hall			
Winding, A.W., Karlson, U. & Mayer, P.	Chemical activity of aromatic hydrocarbons determines growth and growth inhibition of bacteria and protozoa	EC02-2	14:20-14:40 Monday, 21 May
EC04 Bioavailability of sediment and soil organic pollutants – D. Luis Hall			
Mayer, P., L. Torång, C. Legind, M. Holmstrup & F. Reichenberg	The chemical activity of hydrophobic organic pollutants in soils and sediments	EC04-1	14:00-14:20 Tuesday, 22 May
EC05B Fate and exposure modelling – D. Luis Hall			
Bönnhardt, A., R.-U. Ebert, R. Kühne & G. Schüürmann	Prediction of rate constants for the indirect photolysis of organic compounds – modified MOOH method	EC05B-4	12:00-12:20 Wednesday, 23 May
MT01A Effect assessments of multiple stressors: experimental and interpretation approaches – Sala dos Despachantes			
Baas, J., B.P.P. Houte, C.A.M. Gestel & S.A.L.M. Kooijman	Modeling the effects of binary mixtures on survival in time	MT01A-3	09:10-09:30 Monday, 21 May
Holmstrup, M., Bindesbøl, A.-M. & Bayley, M.	Methods to study combined effects of climatic stress and toxic stress using soil animals as test organisms	MT01A-2	08:50-09:10 Monday, 21 May
Kramarz, P., Walczak, K. & Laskowski, R.	Joint effects of the natural and anthropogenic stressors on the potworm <i>Enchytraeus doerjesi</i>	MT01A-5	09:50-10:10 Monday, 21 May

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MT01B Effect assessments of multiple stressors: experimental and interpretation approaches – Sala dos Despachantes			
Payet, J.	Cumulative risk/impact of eutrophication and toxic substances in freshwater ecosystems	MT01B-2	11:20-11:40 Monday, 21 May
MT04B Environmental Quality Assessments using gene expression and “omics” – Archive Hall			
Jones, O.A.H., Spurgeon, D., Svendsen, C. & Griffin, J.L.	Assessing the Toxicity of Poly Aromatic Hydrocarbons via Metabolomics: an example using the Earthworm <i>Lumbricus rubellus</i> .	MT04B-5	12:20-12:40 Tuesday, 22 May
MT08 Systems biology in the environment: Integrating molecular and higher-level biological responses - D. Maria Hall			
Dondero, F., Jonsson, H., Jones, O., Pesce, G., Boatti, L., Marsano, F., Bloomfield, G., Skelton, J., Magnelli, V., Griffin, J., Ivens, A. & Viarengo, A.	Effects of Nickel and Chlorpyrifos in Dictyostelium amoebae: from molecular responses to toxicity pathways using a systems biology approach.	MT08-1	14:00-14:20 Wednesday, 23 May
PH01B Environmental pollution and human health – Porto Hall			
Oostingh, G.J., U. Tischler, M. Schmitzner & A. Duschl	Analysis of the immunomodulatory effects of fluoranthene using a human cell-based screening method.	PH01B-3	11:40-12:00 Wednesday, 23 May
RA04A Advances in Bioaccumulation Assessment – Arrábida Hall			
Dimitrov, S., Dimitrova, N., Parkerton, T., Comber, M., Zok, S., Weisbrod, A. & Mekenyan, O. G.	BCF Base Line Model: refinement and extending the applicability domain	RA04A-5	09:50-10:10 Tuesday, 22 May
RA08 Advances in higher tier assessments – Arrábida Hall			
Loos, M. & Ragas, A.M.J.	A spatially explicit individual-based model for assessing the cumulative risk of combined exposure – <i>A cadmium and nickel case study</i>	RA08-3	09:10-09:30 Wednesday, 23 May
RE05 Risk assessment and regulation – D. Maria Hall			
Assmuth, T., Hilden, M.P.H. & Lyttimäki, J.	Internet survey of expert and stakeholder views regarding cumulative risks from multiple stressors in Europe: Information needs and communication	RE05-2	08:50-09:10 Thursday, 24 May
Benighaus, C.	Perception and Communication of Combined Risks	RE05-6	10:10-10:30 Thursday, 24 May
Craye, M.	Communicating the “hidden content” of environmental health risk maps: transparency about choices and assumptions	RE05-5	09:50-10:10 Thursday, 24 May
SE01A Promoting ecological relevance in ecotoxicology – Archive Hall			
De Lange, M., & Faber, J.H.	Ecological relevance in risk assessment. Assessing ecological vulnerability in wildlife using a conceptual approach	SE01A-3	09:10-09:30 Monday, 21 May

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Poster corner presentations

Advances in Bioaccumulation Assessment: Bioavailability (poster corner)			
Dabitz-Gutsche, N., Schüürmann, G. & Paschke, A.P.	Application of solid phase microextraction for measuring membrane/water-partitioning of organic compounds from different classes.	TU PC2-2	08:00-18:30 Tuesday, 22 May Presentation: 18:00-18:25
Kühne, R., Dabitz-Gutsche, N., Ebert, R-U., Paschke, A. & Schüürmann, G.	Model equation to predict partition coefficients membrane/water from chemical structure	TU PC2-3	08:00-18:30 Tuesday, 22 May Presentation: 18:00-18:25
GIS and other spatial tools in risk presentation related to regulation (poster corner)			
Pistocchi, A., Vizcaino, M.P. & Pennington, D.W.	Applications of the MAPPE modeling strategy for continental scale chemical risk assessment	WE PC4-1	08:00-18:30 Wednesday, 23 May Presentation: 17:30-17:55
Pistocchi, A., Goossens, E., Mehlhorn, B., Pennington, D., Schoening, G. & Craye, M.	Towards chemical pollutant maps of Europe: Joint use of emission inventories and GIS based environmental models for decision support.	WE PC4-5	08:00-18:30 Wednesday, 23 May Presentation: 17:30-17:55
Proteomics and Metabolomics in environmental monitoring (poster corner)			
Jones, O., Spurgeon, D., Svendsen, C., Lister, L.J., Hankard, P.K., Viarengo, A., Dondero, F. & Griffin, J.L.	Cross species comparisons in ecotoxicology: the metabolomics approach	TU PC6-2	08:00-18:30 Tuesday, 22 May Presentation: 17:30-17:55
Jones, O., Walker, A., Shore, F. & Griffin, J.L.	A Metabolic Based NMR Spectroscopy Study of the Effects of Cadmium in Laboratory and Wild Species of Small Mammal	TU PC6-1	08:00-18:30 Tuesday, 22 May Presentation: 17:30-17:55

Poster presentations

EC01P			
New analytical tools in environmental chemistry			
Díaz-Cruz, M.S. & Barcelo, D.	Highly selective sample preparation and GC-MS analysis of chlorpyrifos, diazinon and their major metabolites in sludge and sludge-fertilized agricultural soils	MO 230	08:00-18:30 Monday, 21 May
Paschke, A., Schuster, J., Dabitz-Gutsche, N. & Schüürmann, G.	Temperature dependence of membrane/water partition coefficients	MO 215	08:00-18:30 Monday, 21 May 2007
Torang, L., Reichenberg, F., Glæsner, N., Jonsson, J.A. & Mayer, P.	Measuring chemical activity of PAHs in tissue and lipids by two-step equilibrium sampling with silicone hollow fibers	MO 219	08:00-18:30 Monday, 21 May
EC04P			
Bioavailability of sediment and soil organic pollutants			
Magner, J., Alsberg, T. & Broman, D.	Passive equilibrium sampling, utilizing a novel polystyrene sampler, to determine the bioavailable part of polar pesticides and pharmaceutical residues in water, sediment and soil.	TU 058	08:00-18:30 Tuesday, 22 May

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EC05P Fate and exposure modelling			
Dimitrov, S., Nedelcheva, D., Dimitrova, N. & Mekenyan, O. G.	Predicting biodegradation of chemicals in soil	WE 326	08:00-18:30 Wednesday, 23 May
Hauck, M., Huijbregts, M., Armitage, J., Harbers, J., Cousins, I. & Pistocchi, A.	Uncertainty and spatial variability in European multi-media fate models	WE 354	08:00-18:30 Wednesday, 23 May
Schwöbel, J., Kühne, R., Ebert, R.-U. & Schürmann, G.	Quantum chemical prediction of the Abraham hydrogen bond donor strength	WE 329	08:00-18:30 Wednesday, 23 May
MT01P Effect assessments of multiple stressors: experimental and interpretation approaches			
Bednarska, A., Brzeska, A. & Laskowski, R.	Effect of temperature on nickel kinetics and respiration rates in the ground beetle, <i>Pterostichus oblongopunctatus</i>	MO 278	08:00-18:30 Monday, 21 May
Broerse, M., Baas, J. & Gestel, K.	Using the DEB theory to describe chemical and biological interactions caused by a binary mixture in <i>Folsomia candida</i>	MO 276	08:00-18:30 Monday, 21 May
Campos, B., Rodrigues, S., Loureiro, S., Amorim, M. & Soares, A.	Mixture toxicity of compounds: avoidance behaviour effects in <i>Enchytraeus albidus</i> and <i>Porcellio dilatatus</i>	MO 274	08:00-18:30 Monday, 21 May
Ferreira, A. L. G., Loureiro, S. & Soares, A.	Dose-response behaviour patterns on combined mixtures of metals, specific and non-specific acting chemicals: acute effects on <i>Daphnia magna</i> Straus.	MO 283	08:00-18:30 Monday, 21 May
Kienle, C., Köhler, H.-R. & Gerhardt, A.	Mixture toxicity of chlorpyrifos, diazinon and nickel chloride to zebrafish (<i>Danio rerio</i>) embryos and larvae	MO 286	08:00-18:30 Monday, 21 May
Liedtjens, K., Schuphan, I. & Ratte, H. T.	Effects of chemical mixtures on <i>Lemna minor</i>	MO 289	08:00-18:30 Monday, 21 May
Niklinska, M., Chmolewska, D. & Morawska, J.	Effects of soil moisture and chronic zinc pollution on nickel toxicity to soil microorganisms	MO 277	08:00-18:30 Monday, 21 May
Osterauer, R., Scheil, V. & Köhler, H.-R.	Effects of the insecticides thiaclopride, imidaclopride, diazinone and 3,4-dichloroaniline, their binary mixtures and temperature influence on embryonic development of zebrafish (<i>Danio rerio</i>)	MO 297	08:00-18:30 Monday, 21 May
Scheil, V., Osterauer, R., Triebkorn, R. & Köhler, H.-R.	Influence of three pesticides, a decomposition product of a pesticide and two binary mixtures of them on the stress protein level of <i>Danio rerio</i> larvae	MO 281	08:00-18:30 Monday, 21 May
Swiergosz-Kowalewska, R., Zietara, J., Halota, A., Molenda, P., Musial, M., Stolarek, M. & Tokarz, A.	Effects of temperature and exposure to nickel and chlorpyrifos on nickel toxicokinetics in tissues of the bank vole <i>Clethrionomys glareolus</i>	MO 279	08:00-18:30 Monday, 21 May
Vandenbrouck, T., Soetaert, A., Ferreira, A.L.G., Loureiro, S., Soares, A. & De Coen, W.	A microarray based approach to assess temperature related influences on nickel toxicity in <i>Daphnia magna</i>	MO 309	08:00-18:30 Monday, 21 May
Wichmann, G. & Lehmann, I.	The presence of co-stimulatory signals influences the effects of diazinon and chlorpyrifos on human immune cells	MO 305	08:00-18:30 Monday, 21 May

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MT08P			
Systems biology in the environment: Integration of molecular and traditional ecosystem measurements for understanding stressor impact			
Ost, N., Ebert, R-U., Kühne, R. & Schüürmann, G.	New Approach to Predict Excess Toxicity in the Tetrahymena pyriformis Assay	WE 225	08:00-18:30 Wednesday, 23 May
RA02P			
Validation of pesticide risk assessments. How accurate are we at predicting actual impacts?			
Assmuth, T., Münier, B., Hilden, M. & Lyytimäki, J.	Can colours convey complex risks? – Expert and stakeholder interpretations and views of cumulative risk maps	MO 411	08:00-18:30 Monday, 21 May
Bonzini, S., Verro, V.R., Vighi, M. & Villa, S.	Validation of predictive exposure models for terrestrial ecosystems	MO 412	08:00-18:30 Monday, 21 May
RA03P			
Integrated chemical and biological approaches for the analysis and confirmation of cause-effect relationships			
Baas, J., Kooijman, B. & Jager, D.T.	The statistical properties of NEC estimates when each individual has its own NEC	TU 117	08:00-18:30 Tuesday, 22 May
RA04P			
Advances in bioaccumulation assessment			
Dimitrov, S., Dimitrova, N., Spurgeon, D., Hankard, P. K., Gestel, K. & Meekeny, O. G.	Modelling elimination of polycyclic aromatic compounds in soil organisms	TU 141	08:00-18:30 Tuesday, 22 May
RA06P			
Case studies on sediment risks and impact assessments			
Pistocchi, A.	The sediment compartment in large scale fate and transport modelling of pollutants	TU 157	08:00-18:30 Tuesday, 22 May
RA09P			
Environmental risk assessments for plant protection products in the European Union			
Vighi, M. & Verro, R.	Ecotoxicological risk assessment in surface water for pesticide mixtures	WE 083	08:00-18:30 Wednesday, 23 May
RE01P			
Progress toward the implementation of QSARs and other estimation methods			
Kühne, R., Ebert, R.-U., Schüürmann, G. & Schwoebel, J.	Fragment model to predict the hydrogen bond donor strength of organic compounds from chemical structure	MO 439	08:00-18:30 Monday, 21 May
RE04P			
Derivation and implementation of environmental quality standards			
Faber, J., Van der Pol, J.J.C. & Rutgers, M.	Soil quality and ecosystem services: a land use perspective	TU 457	08:00-18:30 Tuesday, 22 May
SE01P			
Promoting ecological relevance in ecotoxicology			
Langer, M., Köhler, H.-R. & Gerhardt, A.	Effects of the insecticides imidacloprid and thiacloprid on the locomotory behaviour of Danio rerio larvae in acute and subchronic exposures.	MO 157	08:00-18:30 Monday, 21 May
Thomsen, M., Faber, J. & Sørensen, P.	Soil health scenarios – focus on indicators susceptible to chemical stressors	MO 116	08:00-18:30 Monday, 21 May

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NoMiracle Ph.D. Programme 2007

To come...

The NoMiracle Ph.D.-programme will be announced in NoMiracle Newsletter No. 8, June 2007. The courses are going to take place in Salzburg, Austria September 3-4, 2007. At present the following two courses have been planned:

- Risk perception and communication of cumulative stressors,
by Christina Benighaus
- Prediction methods for fate-relevant properties of organic compounds,
by Ralph Kühne et al.

NoMiracle co-ordination

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*Articles in the NoMiracle Newsletter do not necessarily reflect the attitude of the NoMiracle Newsletter.

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