14th Cefic-LRI Annual Workshop 2012

Evolution or Revolution? What Research Priorities for Future Risk Assessment?

BRUSSELS, 14-15 NOVEMBER, 2012

THE SQUARE BRUSSELS MEETING CENTRE

cefic

LRI
The Long-range Research initiative

LRI in brief

A major contribution to a sustainable chemical industry

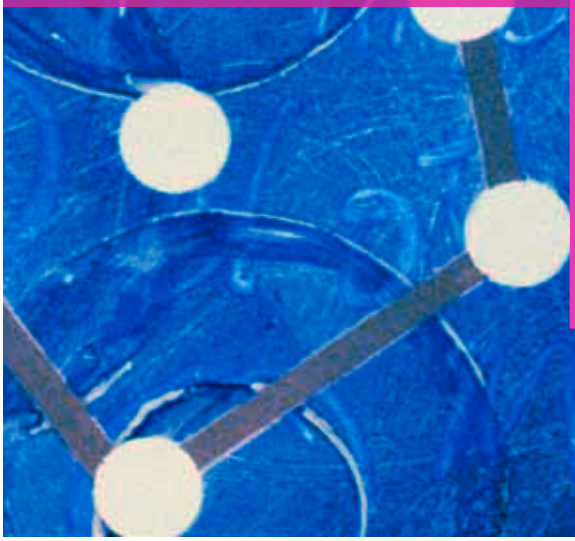
Since 1996, the Long-range Research Initiative (LRI) Programme of Cefic, the European Chemical Industry Council, has been providing proactive scientific data on which the entire industry and regulatory bodies can draw to address societal concerns on a reliable basis.

As a fundamental basis for a sustainable chemical industry and a complement to Responsible Care, LRI presents a research programme that is forward-looking, ambitious but also realistic and coherent. LRI invests in long-term research and delivers transparent, quality-assured scientific data, open to the broad public.

The current research areas of the LRI are addressing key public concerns:

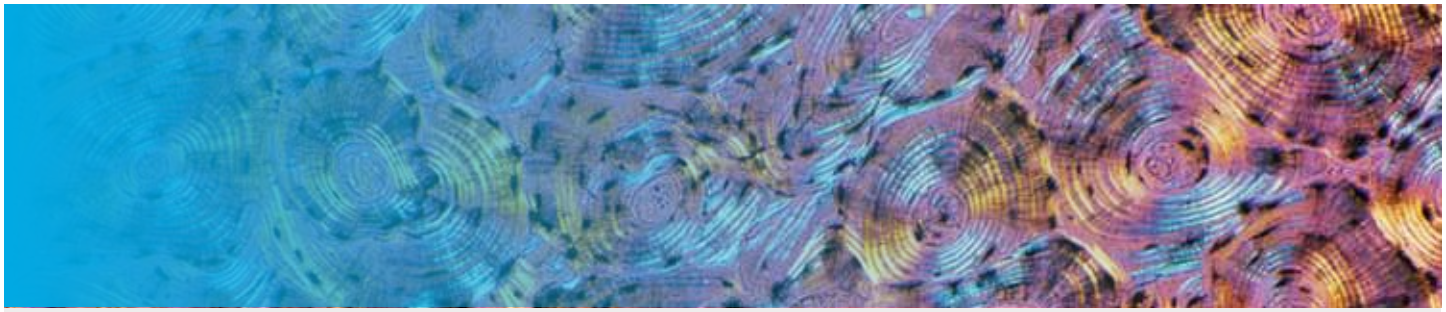
- Development of intelligent testing (including alternatives to animal testing)
- Understanding the effects of chemicals in complex environments
- Public acceptance of new technologies

The 14th edition of the LRI annual workshop addresses the research priorities for future risk assessment from a broad perspective.



POSTERS

Toxicogenomic Investigation into False Positive Responses in the Local Lymph Node Assay (LLNA)	Ian Kimber, University of Manchester, UK
Usage patterns of personal care products: important factors for exposure assessment	Jacqueline Biesterbos, Radboud University, NL
Aggregate consumer exposure to a cyclic siloxane: worst-case vs. probabilistic modeling	Tatsiana Dudzina, ETH Zurich, CH
The Threshold of Toxicological Concern (TTC) for inhalation exposure: New TTC concept for inhalation exposure and derivation of thresholds with the database RepDose	Inga Tluczkiewicz, Fraunhofer Institute for Toxicology and Experimental Medicine ITEM, DE
Animal NOAELS: does adding human data help?	Leslie Rushton, Imperial College London, UK
The DRESS project: DeRmal Exposure aSsessment Strategies	Katleen De Brouwere & Rudi Torfs, VITO, BE
Application of the Maximum Cumulative Ratio (MCR) to chemical mixtures in indoor air	Katleen De Brouwere & Rudi Torfs, VITO, BE

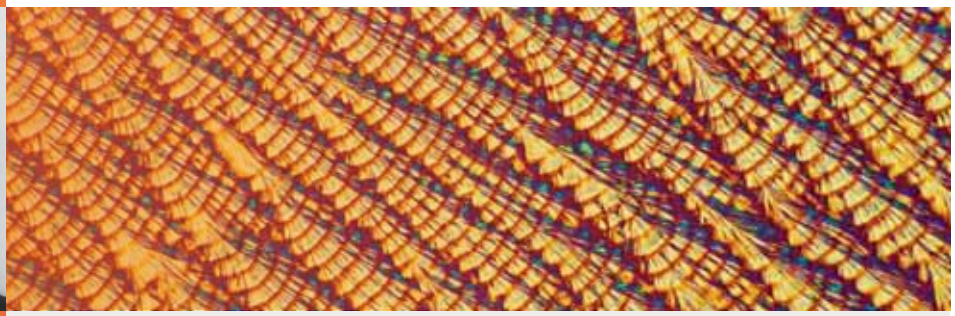


Understanding inter- and intra-individual variability in HBM spot samples	Roel Smolders, VITO, BE
Mechanism-based characterisation of toxicity for RepDose database substances: initial results on cytotoxicity and genomics	Rob H. Stierum, Netherlands Organisation for Applied Scientific Research, TNO (NL)
DECO: Data-integration for Endpoints, Chemoinformatics and Omics	Joost van Delft, Maastricht University, NL
EMSG55: Evaluating Plant Leaf Extracts for Endocrine Activity & Reproductive Toxicity in Fish	Tom Hutchinson, Centre for Environment, Fisheries & Aquaculture Science, CEFAS, UK
Endocrine exposure at environmentally relevant concentrations	Steffen Schneider, BASF, DE
Sediment toxicity testing of organic chemicals in the context of prospective risk assessment	Bart Koelmans, Wageningen University, NL
Persistence testing at the sediment-water interface: Too much effort for too little data?	Kathrin Fenner, EAWAG, CH

PROGRAMME DAY 1

WEDNESDAY
14 NOVEMBER 2012

17.30 - 18.00	Hall 400	Registration
18.00 - 19.30	Hall 400	**Invited poster session on 2011-2012 ongoing/completed projects accompanied by a networking cocktail**
19.30 - 22.00	Hall 400	**Workshop Dinner** **Dinner-Talk: "Making sense of science and evidence"** *by Ms Síle Lane, Sense About Science*



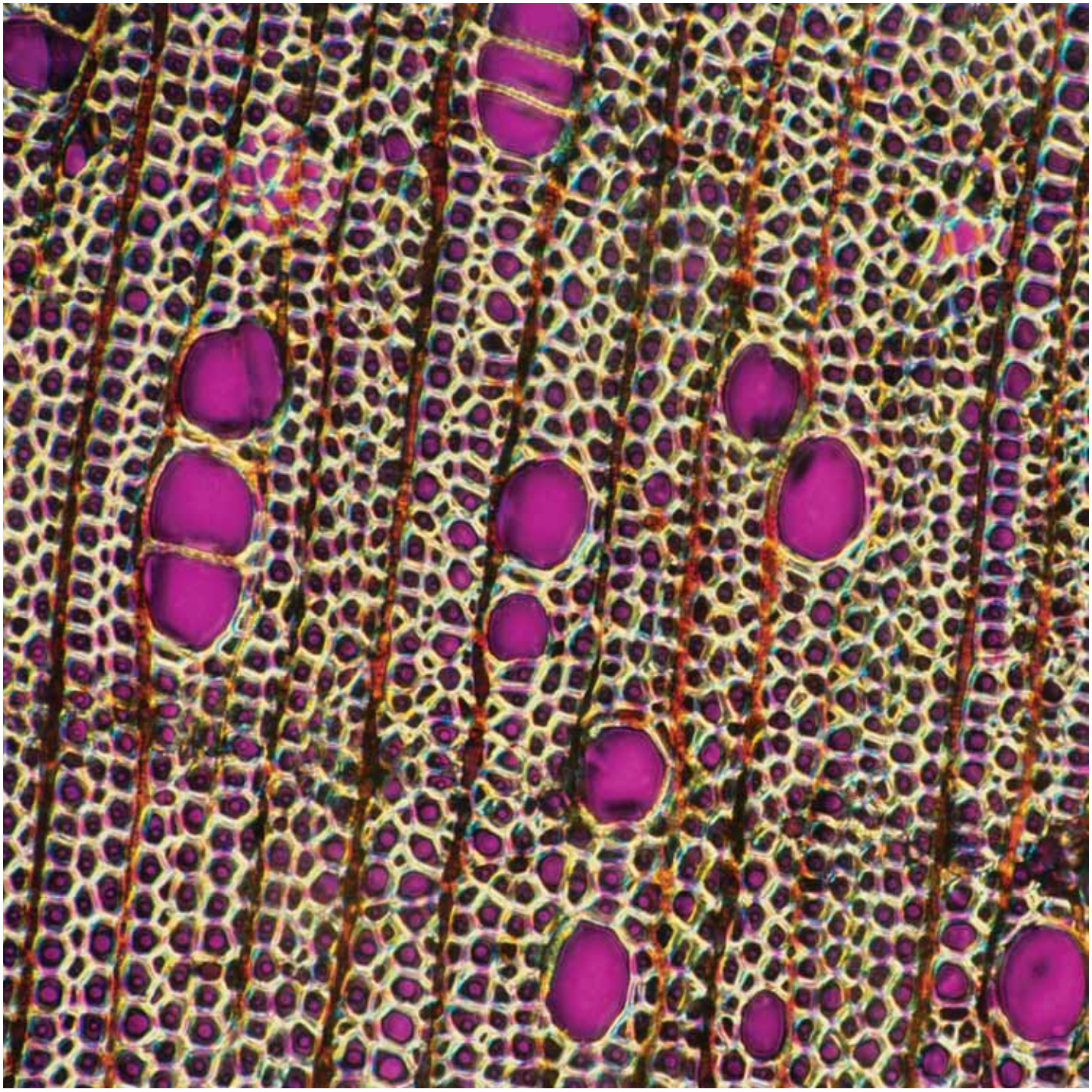
MS SÍLE LANE
Sense About Science

Síle joined Sense About Science as Public Liaison in February 2009 from a career as a stem cell researcher. As Public Liaison Síle worked with regulatory bodies, civic society organisations, the media and policy makers to ensure the public always has access to the best science and evidence. In June 2009 Sense About Science launched the Keep Libel Laws out of Science campaign to reform the UK's outdated libel laws which inhibit scientific discussion worldwide. Síle manages this campaign and has submitted evidence to Parliamentary and Government enquiries The campaign has recently led to the publication of a draft Government libel reform bill. Síle became Campaigns Manager in 2011 and is developing a new dedicated campaigns unit to popularise our approach to standing up for science.

19.30 - 22.00

Dinner talk

Making sense of science and evidence



PROGRAMME DAY 2

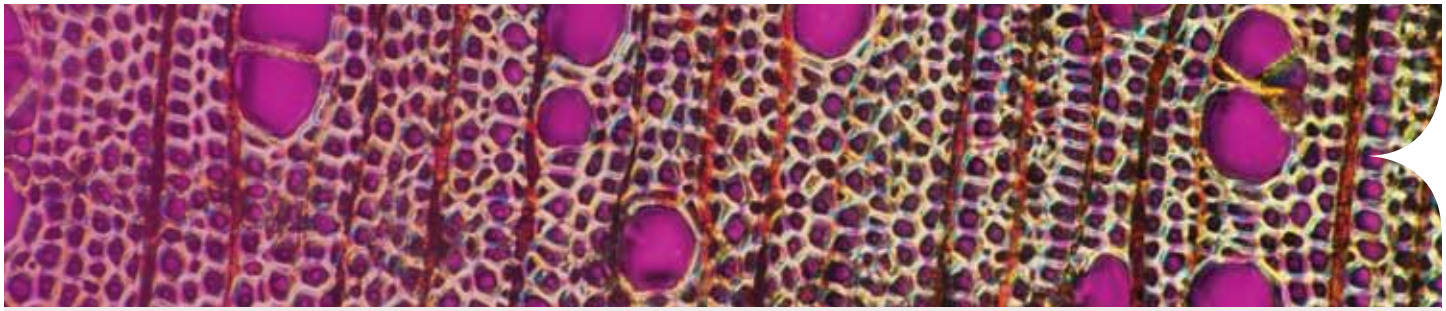
THURSDAY
15 NOVEMBER 2012

8.00 - 8.45	The Arc Foyer	REGISTRATION AND WELCOME COFFEE
8.45 - 9.00	The Arc	Welcome *by Dr. Stuart Marshall, Unilever, LRI SIG*
9.00 - 9.10		Opening remarks *by Pierre Joris, Solvay, R&I Programme Council*
9.10 - 10.35	The Arc	**Keynote session: "Perspectives on Research Priorities for Future Risk Assessment"** *Chair: Dr. Stuart Marshall, Unilever, LRI SIG*
9.10 - 9.35	The Arc	"Putting ecological realism in environmental risk assessment procedures" *by Prof. Colin Janssen, Ghent University*
9.35 - 10.05		"How can evidence based policy contribute to trust?" *by Dr. Jan Staman, Rathenau Instituut*
10.05 - 10.35		"Research Priorities for Future Risk Assessment: Industry perspective" *by Dr. Manfred Marsmann, Bayer*
10.35 - 10.55	The Arc Foyer	COFFEE BREAK

PROGRAMME DAY 2

THURSDAY
15 NOVEMBER 2012

10.55 - 12.55	**The Arc**	**Plenary sessions: "LRI projects results"** *Chair: Dr. Bruno Hubesch, Cefic-LRI*
10.55 - 11.15		"N1 project: Approach on nanomaterial safety of ZnO and SiO_2 – Final results and overall conclusions" *by Dr. Otto Creutzenberg, Fraunhofer ITEM*
11.15 - 11.35		"Testing and assessment of reproductive toxicity of nanomaterials: results of the LRI-N3 project" *by Dr. Andre Wolterbeek, TNO*
11.35 - 11.55	**The Arc**	"Aggregate exposure assessment: tiered approaches and illustration for indoor environments" *by Ir. Rudi Torfs, VITO*
11.55 - 12.15		"Integration of metabolic fate, health effects and biokinetics predictions in an in silico-in vitro-in vivo approach in a tiered testing strategy" *by Prof. Dr. Bas Blaauboer, IRAS, Utrecht University*
12.15 - 12.35		"Bioaccumulation Assessment: Evolution or Revolution?" *by Prof. Michael McLachlan, University of Stockholm*
12.35 - 12.55		"Endocrine disrupters: industry workshop outcomes and key on-going LRI research efforts" *by Drs. Markus Junker & Steffen Schneider, BASF*
13.00 - 14.00	**The Arc Foyer**	LUNCH
14.00 - 14.45	**The Arc**	**LRI Innovative Science Award 2011-2012** *Chair: Prof. Greet Schoeters, University of Antwerp / VITO, ESAP*



14.00 - 14.25	The Arc	"Improving mechanistic understanding of population recovery for aquatic macro-invertebrates" *by Dr. Thomas Preuss, RWTH Aachen University, Awardee 2011*
14.25 - 14.35		LRI Innovative Science Award presentation to Awardee 2012 *by Pierre Joris, CSIO Solvay, R&I Programme Council*
14.35 - 14.45		"Determining Biologically Relevant Effects of Compound Exposure by Chemical, Biological and Phenotypic Data Integration" *by Dr. Andreas Bender, University of Cambridge, Awardee 2012*
14.45 - 16.45	The Arc	**"Priorities for Future Risk Assessment"** *Chair: Prof. Ian Kimber, University of Manchester*
14.45 - 15.15	The Arc	"Challenges in the future of Risk Assessment" *by Prof. Corrado Galli, University of Milan*
15.15 - 15.45		"NANoREG: how to define protection goals on nano?" *by Dr. Tom van Teunenbroek, Ministry of Environmental and Spatial Planning*
15.45 - 16.15	The Arc Foyer	COFFEE BREAK
16.15 - 16.45	The Arc	"The quality of epidemiological research: why does it matter?" *by Prof. Dick Heederik, IRAS, Utrecht University*
16.45 - 17.15		Media perspective: "Scientists say..., but how do they know?" *by Erika Widegren, Atomium Culture*
17.15 - 17.25	The Arc	"Conclusions & future perspectives" *by Dr. Gernot Klotz, Cefic R&I*
17.25 - 17.30	The Arc	Short feedback & Close of Cefic-LRI Workshop 2012

DAY 2 THURSDAY 15 NOVEMBER 2012

8.45 - 9.00

Welcome

9.10 - 10.35

Keynote sessions

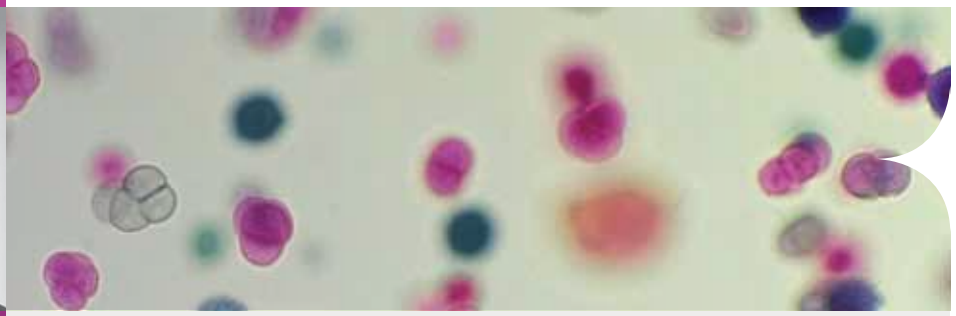
Perspectives on Research Priorities for Future Risk Assessment

CHAIR

DR. STUART MARSCHALL

UNILEVER, LRI SIG

Stuart joined Unilever's corporate Safety and Environmental Assurance Centre (SEAC) in Bedford, UK in 1983 after completing a BSc in Environmental Biology and a PhD in the fate and effects of organolead compounds in natural systems. His current role is Ecotoxicology Science Leader which includes responsibility for SEAC's internal and external environmental safety research programme. Stuart is Chair of the CEFIC LRi Strategic Implementation Group and a member of the ECETOC Scientific Committee.



PIERRE JORIS

Solvay, R&I Programme Council

Pierre Joris is Chief Scientific & Innovation Officer of Solvay S.A, reporting to the CEO. In this role, he is in charge of driving long term/higher risk corporate innovation projects and investments, strengthen innovation capabilities of the group, as well as supervising and cross-fertilising innovation efforts and portfolio in the different businesses. Prior to this assignment, Pierre held different business management positions as Managing Director of Solvay Solexis, the global fluoromaterials activity of the group from 2005 to 2011, General Manager of the Performance Compounds SBU from 2005 to 2005, and as President of Solvay Eng. (US) from 2001 to 2004. He served previously in various corporate positions in Olefins strategic purchasing, Business Development and Licensing from 1992 to 2001.

9.00 - 9.10

Opening Remarks

DAY 2 THURSDAY 15 NOVEMBER 2012

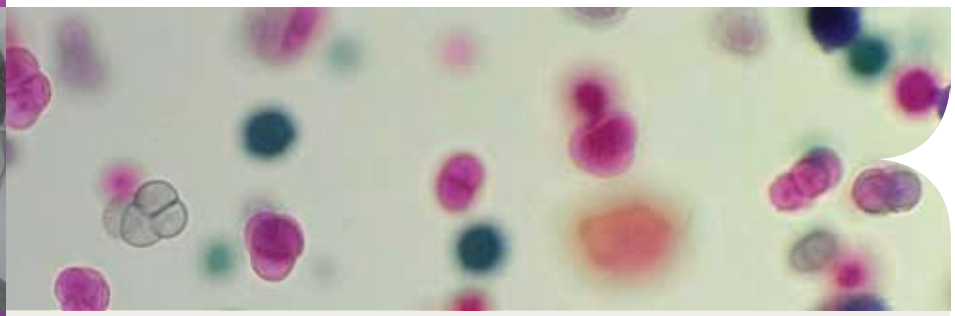
9.10 - 9.35

Putting ecological realism in environmental risk assessment procedures

Regulatory environmental risk assessments are predominantly based on simplified tools which, despite their practical usefulness, lack ecological realism. Their capacity to describe and predict the actual consequences of chemical exposure on the structure and function of natural ecosystems is poor. Therefore, there is a need for the development of new tools capable to account for the complexity in exposure scenarios and in the diversity of communities and ecosystems. Recognizing this need, a number of scientific committees of the European Commission (SCHER, SCENHIR, SCCS) have examined the weaknesses in current procedures and identified a number of issues in current regulatory practices which need addressing. This presentation will provide a brief overview of the findings of these committees and propose a number of research needs in ecotoxicology and a way forward to improve current regulatory approaches to environmental risk assessments of chemicals.

CHAIR
PROF. COLIN JANSSEN
Ghent University

Dr. Colin R. Janssen is full professor of Ecotoxicology at Ghent University, Belgium where he is department head and director of the Laboratory for Environmental Toxicology, Department of Applied Ecology and Environmental Biology at the Faculty of Biosciences. He holds a Masters degree in Zoology and obtained his Ph.D. in Environmental Sciences (1992) from the same university. He now teaches courses in aquatic ecology, marine ecotoxicology and environmental toxicology and risk assessment. C. Janssen is a full member and chair of the Ecotoxicity group of Belgian Health Council. He has published more than 270 international papers.



DR. JAN STAMAN
Rathenau Instituut

Jan Staman is the managing director of the Rathenau Institute in The Netherlands. The Rathenau Institute promotes the formation of political and public opinion on science and technology. To this end, the institute studies the organization and development of science systems, and organizes debates and workshops centred on issues and dilemmas in science and technology. The institute also publishes policy-oriented reports on the social impact of new technologies, and is actively involved in research leading to scientific publications. Jan Staman's interests focus on how ethical and societal issues are processed – in scientific and technological practices, in politics and in the creation of government policy. Jan Staman has degrees in Veterinary Medicine, and in Law.

9.35 - 10.05

How can evidence based policy contribute to trust?

Policy and politics are by no way technocratic practices. The contributions of scientist to these practices are for that reason limited and only when scientists are themselves deeply aware of these limitations they can enforce trust by their contributions. In my lecture we will explore the interface between science and politics.

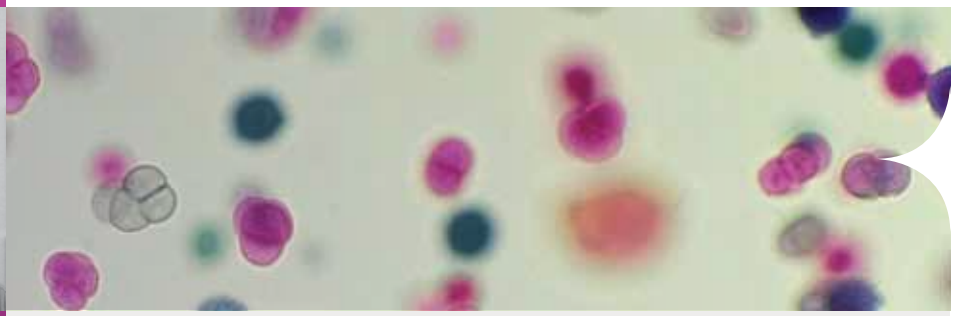
DAY 2 THURSDAY 15 NOVEMBER 2012

10.05 - 10.55

Research Priorities for Future Risk Assessment: Industry perspective

CHAIR
DR. MANFRED MARSMANN
Bayer

Manfred Marsmann, born in 1951, graduated from the University of Münster, Germany, with a doctorate in organic chemistry. In 1980, he joined Bayer AG, where he initially worked in the field of pharmacokinetics. He moved to the Environmental Protection Section of Bayer Leverkusen in 1987 and is currently member of the corporate center Environment & Sustainability; main topics: international chemicals policy, sustainability concepts, energy & climate change, risk assessment.



DR. BRUNO HUBESCH
CEFIC-LRI

Dr. Bruno Hubesch obtained his Master degree in Nuclear Chemistry in 1980 and his PhD in Physical Chemistry in the area of Photochemistry in 1985 from the University of Louvain, Belgium. After service as non-commissioned officer in the Belgian Air Force, he pursued from 1987 to 1990 postdoctoral research as a Fulbright Scholar and NATO Science Fellow at the University of California, San Francisco at the Faculty of Medicine at the Veterans Administration Hospital. In 1990 he joined Procter & Gamble, Household Care R&D. In 2009 he joined in secondment CEFIC Research & Innovation as the LRI Programme Manager.

10.55 - 12.45

Keynote sessions

LRI projects results

DAY 2 THURSDAY 15 NOVEMBER 2012

10.55 - 11.5

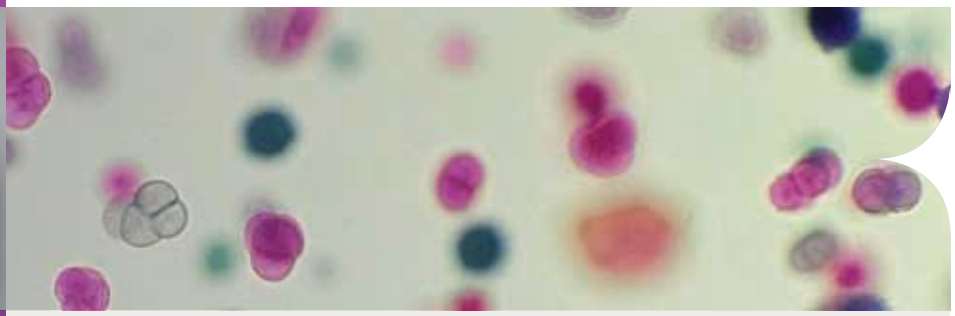
N1 project: Approach on nanomaterial safety of ZnO and SiO_2 – Final results and overall conclusions

This project on ZnO and amorphous SiO_2 was conducted at Fraunhofer ITEM as the Cefic-funded contribution to the OECD Sponsorship Programme. OECD 412 and 413 inhalation test guidelines were expanded by additional endpoints addressing nanoparticle-specific toxicity: i.) bronchoalveolar lavage (BAL) to analyse inflammation; ii.) toxicokinetics; iii.) genotoxicity: micronucleus test (MN), 8-OH-dG in lung tissue; iv.) cell proliferation (BrdU).

ZnO: A 14-day and a subsequent 90-day nose-only inhalation test were conducted with the nanoscaled test item Z-COTE® HP1 and a microscaled reference ZnO. Z-COTE® HP1 shows a rapid dissolution under lysosomal pH and thus does not accumulate in lungs. SiO_2: Precipitated SiO_2 (NM-200; JRC origin) applied in the food sector was investigated analogically; in addition, a 4-wk oral toxicity study was included (NOAEL: 1000 mg/kg/day). In vivo tests juxtaposed to *in vitro* counterparts complement one another.

DR. OTTO CREUTZENBERG
Fraunhofer ITEM

Dr. Otto Creutzenberg studied chemistry and biochemistry at the University of Münster, Germany. Since 1985 he has been a scientific staff member in the department of Inhalation Toxicology, Fraunhofer ITEM, Hanover, Germany, with a research focus on toxicology of lungs. In 1996 he graduated from the University of Leipzig as a certified chemist for toxicology. Since 2003 he has been a scientific staff member in the department of Inhalation Toxicology and Chemical Risk Assessment in Fraunhofer ITEM. He is an expert in inhalation toxicity of (nano)particles and fibres.



DR. ANDRE WOLTERBEEK
TNO

André Wolterbeek studied cellular biology at the University of Wageningen with a specialization in Toxicology. He received his PhD at this University and more than 15 years ago he started as a study director Reproductive Toxicology at TNO. He is responsible for the conduct of regulatory reproductive toxicity studies, including prenatal developmental- and two-generation reproductive toxicity studies. Andre has special expertise on metabolic imprinting, neuro- and immunodevelopmental toxicity studies, juvenile toxicity studies, evaluation of the extended-one generation toxicity studies and the effects and distribution of nanoparticles in pregnant animals.

11.15 - 11.35

Testing and assessment of reproductive toxicity of nanomaterials: results of the LRI-N3 project

The engineering of new nanomaterials offers extraordinary opportunities in various technological fields. In order to come to concrete products that can be marketed, safety assessments must complement the technological progress. The assessment of potential developmental and reproductive toxicity is of great importance and current guidelines in this field must be evaluated for their applicability to nanomaterials. As part of the Cefic-LRI N3-TNO project, an oral two-generation reproduction toxicity study (OECD 416) and an oral prenatal developmental toxicity study (OECD 414) with synthetic amorphous silica, NM-200 and an inhalatory OECD414 study with zinc oxide, Z-Cote HP1 were performed.

DAY 2 THURSDAY 15 NOVEMBER 2012

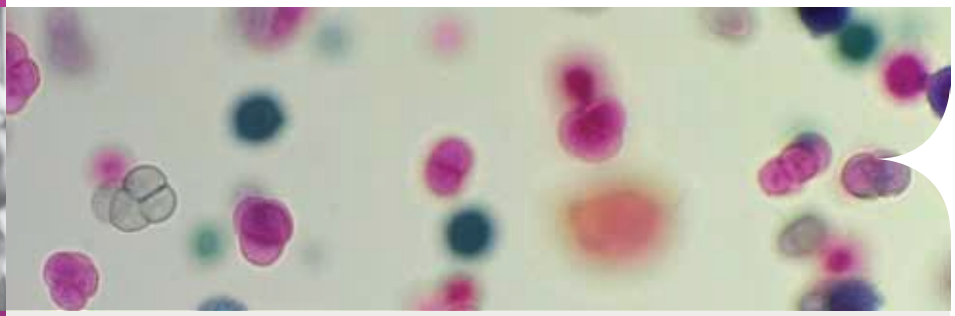
11.35 - 11.55

Aggregate exposure assessment: tiered approaches and illustration for indoor environments

An aggregate exposure assessment is required when one aims to evaluate overall exposure to a chemical from various sources and pathways and the contribution of these to body burden and health effects. Quantifying all possible sources, pathways and routes of exposure can become a very complex task in terms of data collection, data assessment, exposure modelling and – not least – verification. A tiered approach guiding the user towards the relevant aspects of aggregation can help to optimize and reduce required efforts. The TAGS project developed a tiered approach to (non-occupational) aggregate exposure assessment, distinguishing three tiers with increasing levels of data needs and complexity. The INTERA project aimed to improve our understanding of human exposure to indoor pollutants in homes and as such addressed a specific area of aggregate exposure assessment, in terms of aggregation over various indoor sources and pathways (inhalation, dermal and oral).

IR. RUDI TORFS
VITO

Rudi Torfs is head of the research unit "Environmental Risk and health" at VITO, leading a team of 80 dedicated researchers, PhDs and lab technicians. Research topics within the unit range from environmental and chemical exposure assessment, over human biomonitoring to applied biomolecular research. Rudi's main expertise lies in the area of exposure and health impact assessment, and policy supporting research in the field of ambient and indoor air pollution and chemical exposures. In the CEFIC-LRI program he is now coordinator of the LRI-B9 DRESS project on dermal exposure assessment and the LRI-MIAT4 project on applying the Maximum Cumulative Ratio (MCR) on indoor air mixtures.



PROF. DR. BAS BLAAUBOER
IRAS

Bas Blaauboer (1949) studied biology at Utrecht University and did a PhD in toxicology at the same university (1978). He spent a post-doctoral year at the MRC Toxicology Unit in the UK (1979), and when he returned to Utrecht led a group on in vitro toxicology (biochemical and cellular toxicology), first in the Department of Veterinary Pharmacology and Toxicology. Later the research in toxicology was moved to the interfacultary Research Institute for Toxicology (RITOX), which after a merger in 2000 became a part of the Institute of Risk Assessment Sciences (IRAS). In 2008 het was appointed to the Doerenkamp-Zbinden Chair on "Alternatives to Animal Testing in Toxicological Risk Assessment", which will be located in IRAS.

11.55 - 12.15

Integration of metabolic fate, health effects and biokinetics predictions in an in silico-in vitro-in vivo approach in a tiered testing strategy

In toxicology and chemical risk assessment, there is a need for the development, validation and acceptance of methods to reduce, refine or replace the use of laboratory animals as much as possible and fall back to in vivo testing only as the highest tier in a testing strategy. In the absence of in vivo data, a first step in such a strategy could be the use of in silico predictions of metabolism and toxicity. The outcome could be used to prioritize in vitro test systems. We compared the predictions of several toxicity prediction software systems with the observed in vivo toxicity to investigate to what extent they can be correctly predicted. For the evaluation of these systems, a set of widely varying chemicals was selected based on the availability of in vivo data. Additionally, in silico predicted metabolites of the chemicals of interest were compared with observed in vivo metabolite formation.

DAY 2 THURSDAY 15 NOVEMBER 2012

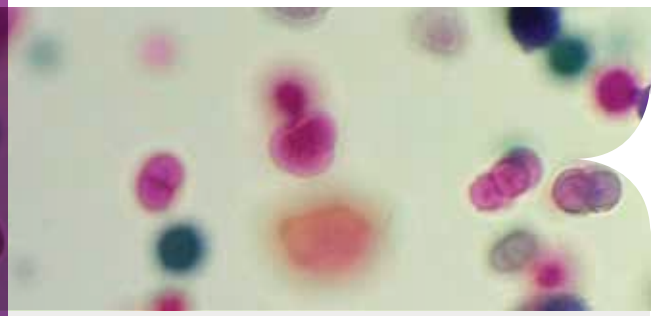
12.15 - 12.35

Bioaccumulation Assessment: Evolution or Revolution?

The method for bioaccumulation assessment currently prescribed in many regulations is the fish bioconcentration test. Recently, the trophic magnification factor (TMF) was proposed as a superior, gold standard metric for bioaccumulation assessment. This talk will present recent work aimed at improving our ability to assess bioaccumulation using these two metrics. For fish BCF determination, the use of passive dosing to maintain stable concentrations of sparingly soluble chemicals during fish exposure will be demonstrated. Secondly, the potential of in vivo passive sampling of chemicals in fish tissue as a method of reducing animal requirements will be explored. Finally, we will elucidate the application of benchmarking to both correct for growth dilution and to improve the precision of the fish BCF determination. Turning to TMF, the challenges in producing consensus values by field assessment will be illustrated. An alternative tiered approach to TMF based assessment will be introduced and initial results presented.

PROF. MICHAEL McLACHLAN
University of Stockholm

Michael McLachlan is a Professor in Analytical Environmental Chemistry and Deputy Head of the Department of Applied Environmental Science at Stockholm University. He has an undergraduate degree in engineering, a Masters in Applied Science from the University of Toronto, and a Doctorate from the University of Bayreuth. He was Professor of Marine Chemistry at the University of Rostock for 5 years before moving to Stockholm 7 years ago. His research interests are the environmental fate and bioaccumulation of organic contaminants, with a particular emphasis on applying trace analytical methods, innovate sampling techniques, field experimentation and mathematical models to yield new insights and create useful tools.



DR. STEFFEN SCHNEIDER **DR. MARKUS JUNKER**
BASF

Principal Scientist, Experimental Toxicology and Ecology, BASF SE. Responsible for Developmental and Reproductive Toxicology (DART) at BASF since 2001. Veterinarian, certified specialist in pharmacology and toxicology. Study director for subchronic/chronic and DART studies since 1991. During this time responsible for numerous studies on pharmaceuticals, chemicals and agrochemicals in the field of developmental and reproductive toxicology and acknowledged expert for DART in different scientific groups.

Markus Junker studied biology at the University of Bayreuth (Germany) and joined BASF in 2000 starting as a study director for aquatic standard and higher tier studies and project coordinator for fungicides. After leaving BASF for a one year intermediate position as ecotoxicologist at RIFCon GmbH in Heidelberg, he restarted at BASF in the department for eco-toxicological risk assessment and product stewardship giving ecotoxicological support for petrochemical and agrochemical products and being responsible for the preparation of registration dossiers for industrial chemicals within the scope of REACH.

12.35 - 12.55

Endocrine disrupters: industry workshop outcomes and key on-going LRI research efforts

The Cross-Industry Workshop on Endocrine Disruption & Developing European Regulatory Policy (May 2012) has helped participants understand the developing Commission strategy and global developments (political background), the proposals from various competent authorities and stakeholders especially the approach developed by industry (scientific background). It has also offered participants to be part of discussions on specific aspects for the further industry advocacy strategy and engagement via dedicated break-out group discussions on 4 key questions: health effects/new endpoints, categorization/classification, proposed regulatory approach, threshold/low dose.

DAY 2 THURSDAY 15 NOVEMBER 2012

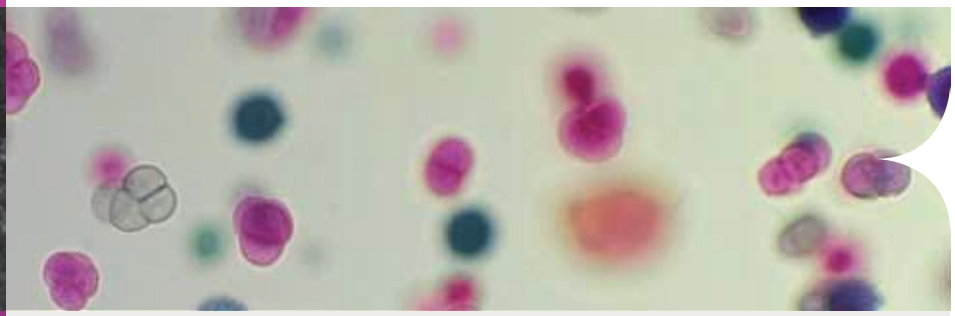
14.00 - 14.45

LRI Innovative Science Award 2011-2012

PROF. GREET SCHOETERS

University of Antwerp / VITO, ESAP

Greet Schoeters is program manager of environmental health at VITO (The Flemish Institute for Technological Research) and professor at the department of biomedical sciences of the University of Antwerp where she coordinates a master's program on environment and health. She coordinates the Flemish human biomonitoring study (FLEHS) of the Flemish ministries of Environment and Health (2002-2015) and participates in the EU ESBIO and EU COPHES project to prepare a European human biomonitoring program. She was president of ESTIV (2008-2012), the European Society for Toxicology in Vitro and committed to initiatives for accelerating the transition to a toxicity pathway-based paradigm for chemical safety assessment. She was member of the CONTAM panel of the European Food Safety Agency (2003-2006).



DR. THOMAS PREUSS

RWTH Aachen University, Awardee 2011

Thomas G. Preuss's field of research is the understanding and prediction of effects from chemical stressors on different biological levels. The main focus is on the use of various modelling techniques to link and extrapolate the effects between various environmental conditions as well as different biological levels. He is chair of the SETAC Advisory group MeMoRisk (Mechanistic Effect Models for Ecological Risk Assessment of Chemicals) and external expert for aquatic ecotoxicology at the European Food Safety Authority. Currently Thomas holds a position at assistant professor at the Institute for Environmental Research at RWTH Aachen University. His phd-thesis was awarded by the SETAC-GLB young investigator award in 2006.

14.00 - 14.25

Improving mechanistic understanding of population recovery for aquatic macro-invertebrates

The aim of this study is the development of a scientifically-based approach for the mechanistic analysis and prediction of recovery for aquatic macroinvertebrates, therefore analysis of field data and mechanistic modelling will gear into each other. In this talk preliminary results of the first year will be presented focussing on the use of realistic population models to simulate effects in the field and time to recovery under experimental conditions. Factors influencing recovery were investigated using an individual based Daphnia and Chaoborus population model. To disentangle the differences in sensitivity often found in laboratory and semifield experiments (mesocosms) we used additionally an individual based Copepod model. It was demonstrated that the models were able to predict this sensitive by the population sustainability. It can be concluded that recovery and population level effects not only depend on the chemical but on the species as well as environmental scenario. Mechanistic population models are the key concept which can handle this complexity.

DAY 2 THURSDAY 15 NOVEMBER 2012

14.35 - 14.45

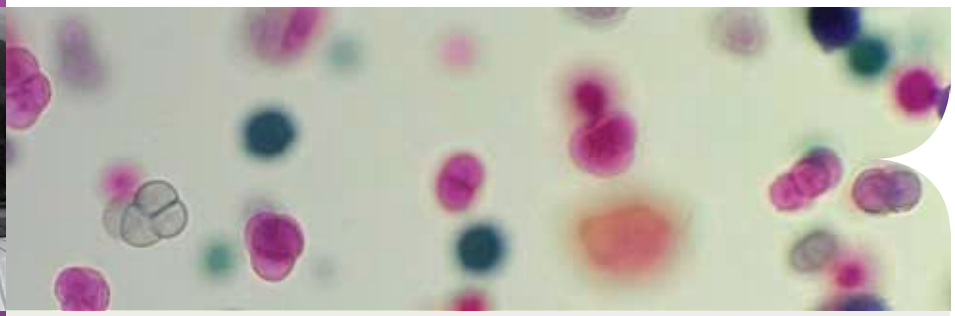
Determining Biologically Relevant Effects of Compound Exposure by Chemical, Biological and Phenotypic Data Integration

There are two principal aims of this study: The first aim is to understand the reason for the toxicity and bioactivity of a particular substance, and the second aim is to predict which chemical compounds could show the same (or similar) activities that have not yet been tested in experiment. More specifically, by mining chemical and biological data, we have developed a computational 'target prediction tool', that predicts potential protein targets for compound where the target proteins are unknown. This part of the project will provide insights into which targets might be modulated by an orphaned compound, and whether the target is responsible for eliciting doping effects. Secondly, we are developing a tool that predicts the phenotype (or physiological symptoms) given a particular chemical structure is applied to the human body. Finally, we will then combine the result from both methods with gene expression data, to produce a stronger and more reliable prediction on whether a compound has the ability to cause toxic effects.

DR. ANDREAS BENDER

University of Cambridge, Awardee 2012

Andreas Bender is a Lecturer for Molecular Informatics with the Unilever Centre for Molecular Science Informatics at the University of Cambridge. He received his PhD from the University of Cambridge as a Cambridge Gates Scholar in 2005 and worked in the Lead Discovery Informatics group at Novartis in Cambridge/MA as well as at Leiden University in the Netherlands before his current appointment. In his work, he is involved with the integration and analysis of chemical and biological data, aimed at understanding phenotypic compound action (such as cellular readouts, and also organism-level effects) on a mechanistic level, ranging from compound efficacy to toxicity. His work is documented in more than 90 scientific publications in the cheminformatics and related fields.



CHAIR
PROF. IAN KIMBER
University of Manchester

Ian Kimber is currently Professor of Toxicology and Associate Dean for Business Development in the Faculty of Life Sciences at the University of Manchester. Previous to that he was Head of Research and Principal Fellow at the Syngenta Central Toxicology Laboratory. He has published over 500 research papers, review articles and book chapters and serves currently on the editorial boards of toxicology, immunology, dermatology and pathology journals. Earlier this year Professor Kimber was awarded the Bo Holmstedt Memorial Fund Award and Lectureship by Eurotox. In 2011 Professor Kimber was awarded an OBE in the Queen's Birthday Honours list.

14.45 - 16.45

Priorities for Future Risk Assessment

DAY 2 THURSDAY 15 NOVEMBER 2012

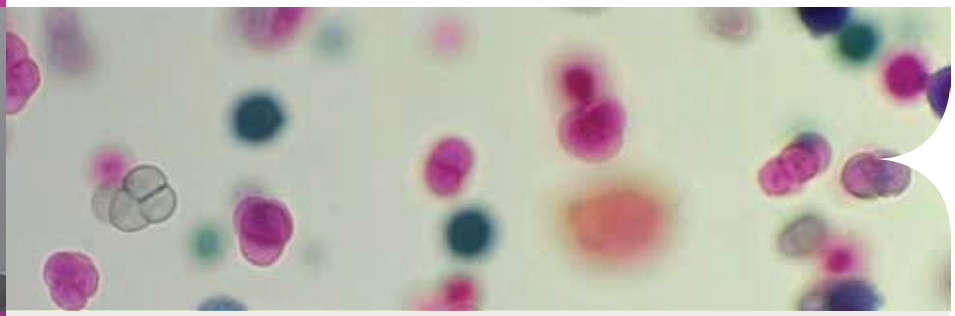
14.45 - 15.15

Challenges in the future of Risk Assessment

Under EU legislation, chemicals used in different sectors must be authorised before they can be marketed. Once authorised, these substances are compiled on an EU list of permitted chemicals, which also specifies their conditions of use. As it is now the process is very prescriptive since in developing their dossier, applicants will not be able to more readily identify relevant data needs, which will allow adequate assessment of risks to humans from the intended use, whilst strengthening the scientific basis for the assessment. For the toxicological studies, the guidances describe a tiered approach which balances data requirements against the risk. A number of issues related to the design, conduct and interpretation of all toxicological studies, are addressed in the presentation. Inherent in the rationale of a tiered approach is the concept that results of studies at higher tiers will in principle supersede results at lower tiers.

PROF. CORRADO GALLI
University of Milan

Prof. Galli's professional studies and career have dynamically contributed to the promotion, continuous development and use of risk assessment using a robust scientific approach and strongly supporting the use of mechanistic toxicology to improve the risk assessment process. Developing an original research program with emphasis on molecular and cellular mechanism for toxicity, including in vitro toxicology, Prof. Galli has assisted numerous students and professionals in the field by demonstrating how chemicals exposure cause adverse effects under various situations and in certain populations. Prof. Galli is author of more than 200 publications, and a member of numerous national and international scientific committees.



DR.
TOM VAN TEUNENBROEK
Ministry of Environmental and Spacial Planning

Tom van Teunenbroek is a Molecular biochemist and neurotoxicologist in Utrecht University and also holds a Research Fellowship at the University of Chicago. He is currently working as a Research & Policy coordinator chemical safety and he is responsible for developing the policy in the Netherlands for nano-technology and nano materials. He has also set up a research programme 2011-2016 for nano technology innovation in the Netherlands, where an integral part of R&D consists of research on risk management and nano safety. He is Representative for Netherlands at OECD WPNM (co-author: guidance document sponsorship programme) and Member of FP7 high level planning group on nano technologies. He participates in the "safety for success" dialogue for DG SANCO and is also the Coordinator of NanoReg Project.

15.15 - 15.45

NANoREG: how to define protection goals on nano?

The process from hazard identification to risk assessment, followed by risk management, mitigation, and avoidance, forms the only acceptable route for evaluating MNMs. The approach to achieve this process will be:

- To collect and evaluate all existing data, from ongoing and completed national, EU and international sources. Where do we stand at present.
- To define the boundaries of this project, i.e. which fields will be excluded.
- To make a gap analysis to identify those nanomaterials where regulatory and testing input is needed either just to give additional guidance, or to make modifications to existing testing schemes, or for where new methodologies are needed.
- Agree on test methods based on relevant data.
- Establishing a forum to decide how to implement changes to the guidance and guidelines, a core task in the project.
- Agree the data storage and management from the project.
- Ensure open and transparent dissemination.

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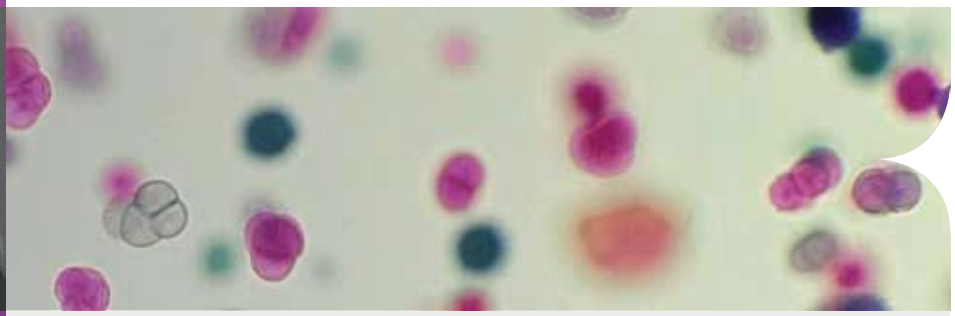
16.15 - 16.45

The quality of epidemiological research: why does it matter?

Principles of design, conduct and analysis of epidemiological studies have been well established. However, realization of these principles in occupational epidemiology often depends on contextual aspects. In addition, many details differ between epidemiological, even involving studies exploring associations between similar health endpoints and similar environmental or occupational exposures. As a result, the quality of different epidemiological studies can vary strongly. Careful evaluation of the quality of epidemiological studies is required to assess the suitability of these studies for quantitative risk assessment. Recently, guidelines have been developed that facilitate a structured transparent evaluation of epidemiological studies. The approach harmonizes the evaluation of epidemiological studies and application is illustrated in the context of meta-analyses which yield summary measures of association to be used for quantitative risk assessment. These examples show that when quality of epidemiological evidence is considered, different risk estimates per unit of exposure might be obtained and this will influence the outcomes of quantitative risk assessment processes.

PROF. DICK HEEDERIK
IRAS

Professor Heederik, has been trained as epidemiologist and hygienist and has been principal investigator in many large scale epidemiologic studies on occupational and environmental exposures in relation to health effects. He is a specialist in exposure assessment issues in epidemiology and has been involved in cohort, case-control and cross sectional studies involving different endpoints (respiratory diseases, reproductive endpoints, cancer), with an emphasis on allergy and asthma in different industries involving high and low molecular sensitizers. He has been teaching in Europe and the US and South Africa and supervised over 30 PhD fellows. He has a prominent role in several EU funded multicenter studies.



ERIKA WIDEGREN
Atomium Culture

Erika Widegren is Executive Director of Atomium Culture and has been working in the field of connecting science and society for nearly a decade. She graduated from the University of Edinburgh in Philosophy and Political Science, where she also continued her studies in Economics and Mathematics. Erika has actively cooperated to the development strategy of the Permanent Platform of Atomium Culture, together with the former French President and Honorary President V. Giscard d'Estaing and the President M. Baracchi Bonvicini, founders of AC. She is currently heading the launch of the EU Science Media Centre and the European Institute for Science in Society.

16.45 - 17.15

Media perspective: "Scientists say..., but how do they know?

Media affect almost all aspects of contemporary life and they are inherent in defining key social and cultural processes thus affecting the fundamental choices of society. In a time when technology and innovation are being developed at an ever increasing speed and impinge upon society at large it is important to assess how to inform the public about the risks and benefits of new technologies and how to inform policy makers about societal evolutions and opinions. Further, new media are changing the relationship and behaviour of audiences. How can these new means of communication increase the trust with the public at large? How can new media be developed as a constructive and interactive channel between different stakeholders and the public?

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17.15 - 17.25

Conclusions & future perspectives

DR. GERNOT KLOTZ
Cefic R&I

After having worked for the US based pharmaceutical company Armour, **Dr. Gernot Klotz** joined Bayer in various business sections. Since February 2007 G. Klotz has been seconded as the Executive Director for Research and Innovation for the European Chemical Industry Council (Cefic). Key areas of responsibility are innovation (technology development, innovation policies, societal acceptance of new technologies and products), the Long Range Research Initiative (LRI) Programme, as well as managing the CEFIC Research and Innovation Programme Council. He is also a Board Member of the EU Technology Platform for Sustainable Chemistry (SusChem). G. Klotz has been called on to various advisory and steering committees at OECD, WHO and EU Commission.

In its sixteen years of activity, the Long-range Research Initiative (LRI) programme has made substantial strides in providing proactive scientific advice to industry, regulators and policy makers, and designing a robust, reliable framework on which they can draw to respond more quickly and accurately to societal concerns.

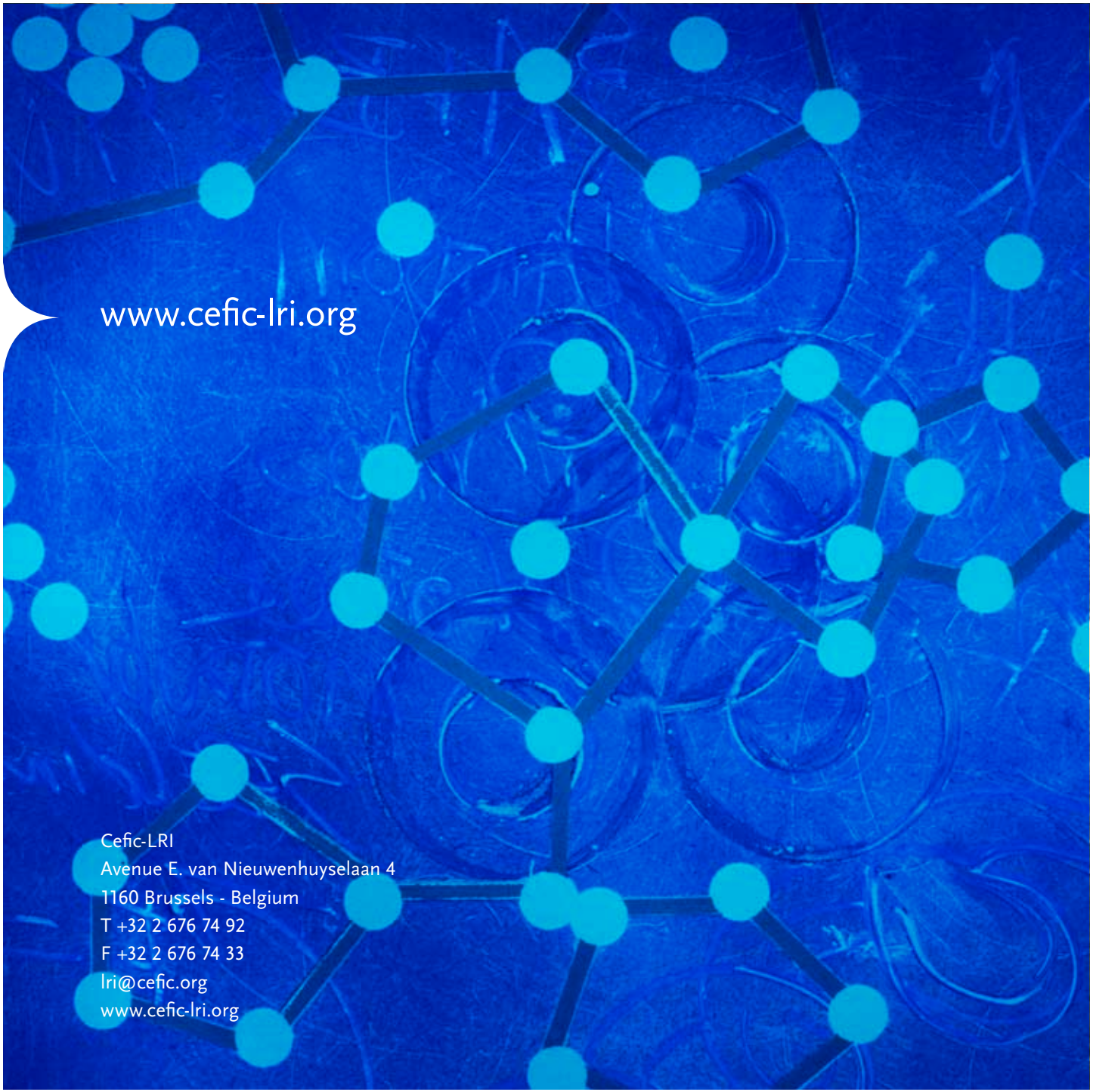
More forward looking, LRI aims to support the competitive and innovative edge for Europe and its chemical industry. It has adjusted focus to keep it in line with key public concerns:

- Development of intelligent testing (including alternatives to animal testing);
- Understanding the effects of chemicals in complex environments and health (including endocrine and cocktail effects);
- Public acceptance of new technologies and products.

Workshop Chair: Stuart Marshall, Unilever, LRI SIG

Workshop Organizers: LRI secretariat (Bruno Hubesch), Gernot Klotz, Stuart Marshall, Dolf van Wijk, Mark Lampi, Burkhard Flick, Gerard Swaen, Chris Money

Communication and logistics: Maria Andrielou



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