Long Range Research Initiative: Mission, Strategic Themes and Areas, Programme 2010– 2011

LRI Workshop UIC - Paris, 27 May 2011

The Long-range Research Initiative

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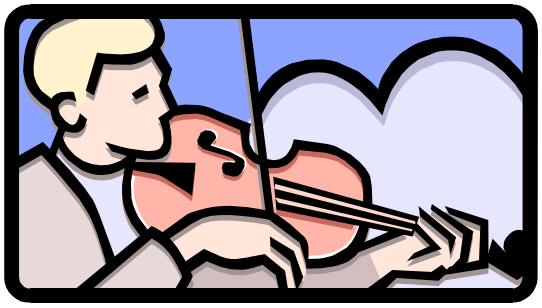
Talk Outline



1. What is LRI & why / CEFIC ?
2. LRI added value
3. Strategic Themes now and beyond
4. Criteria for project selection
5. Project Process & timings
6. Relevant Issues for LRI
7. Key highlights of contributions
8. New projects started 2009/2011
9. Acceptance/societal impact
10. Opportunities for French research capability

CEFIC = European Chemical Industry Council

- **Chemistry making a world of difference**

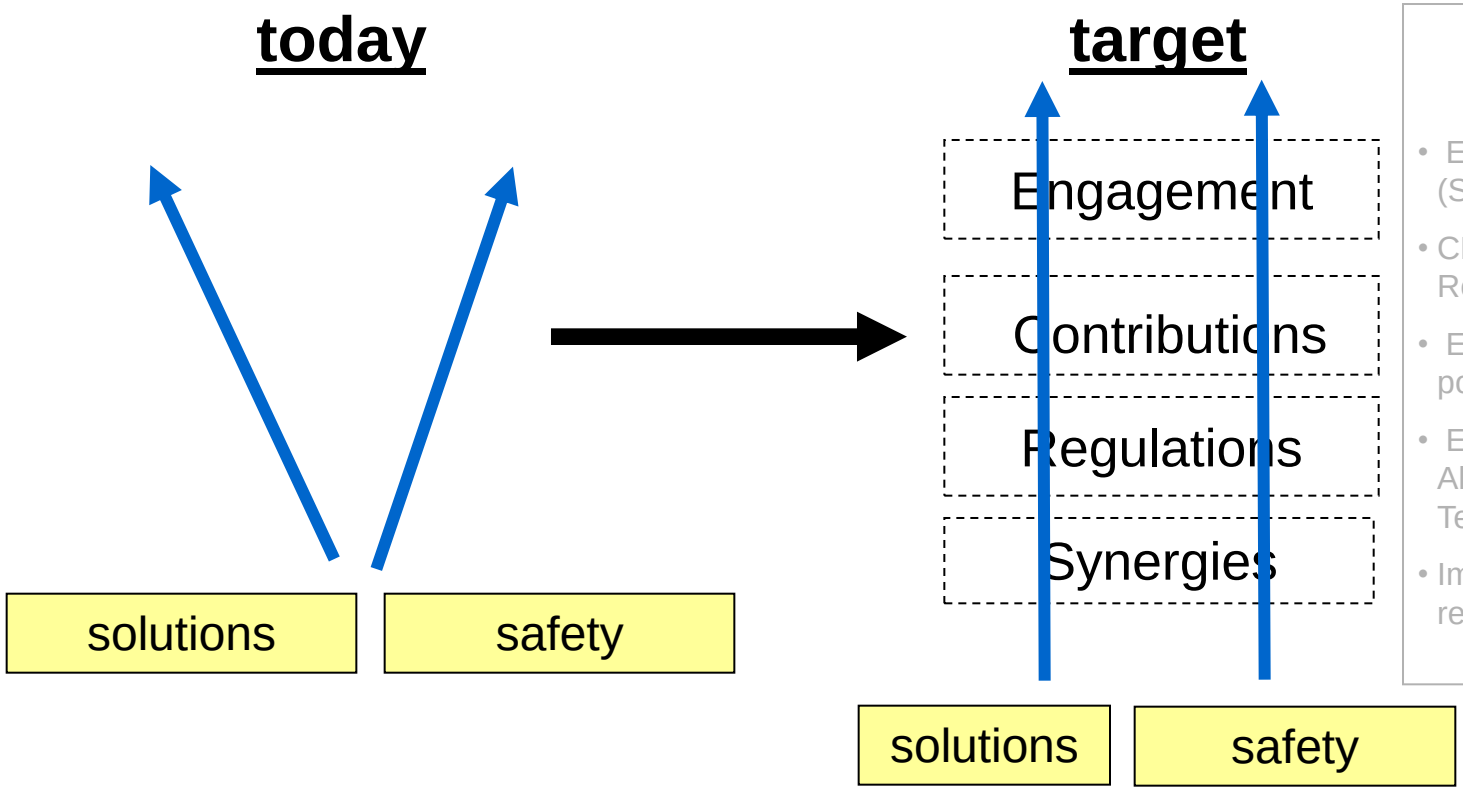
- **Forum and voice of the chemical industry in Europe**
- **Brussels based office of 140 people working with over 4,000 people across the industry**
- **Chemical industry employs 1.2M people / about 500B Eur / 25% world production**

Cefic was founded in 1972

www.cefic.org

A Must for a sustainable Chemical Industry !

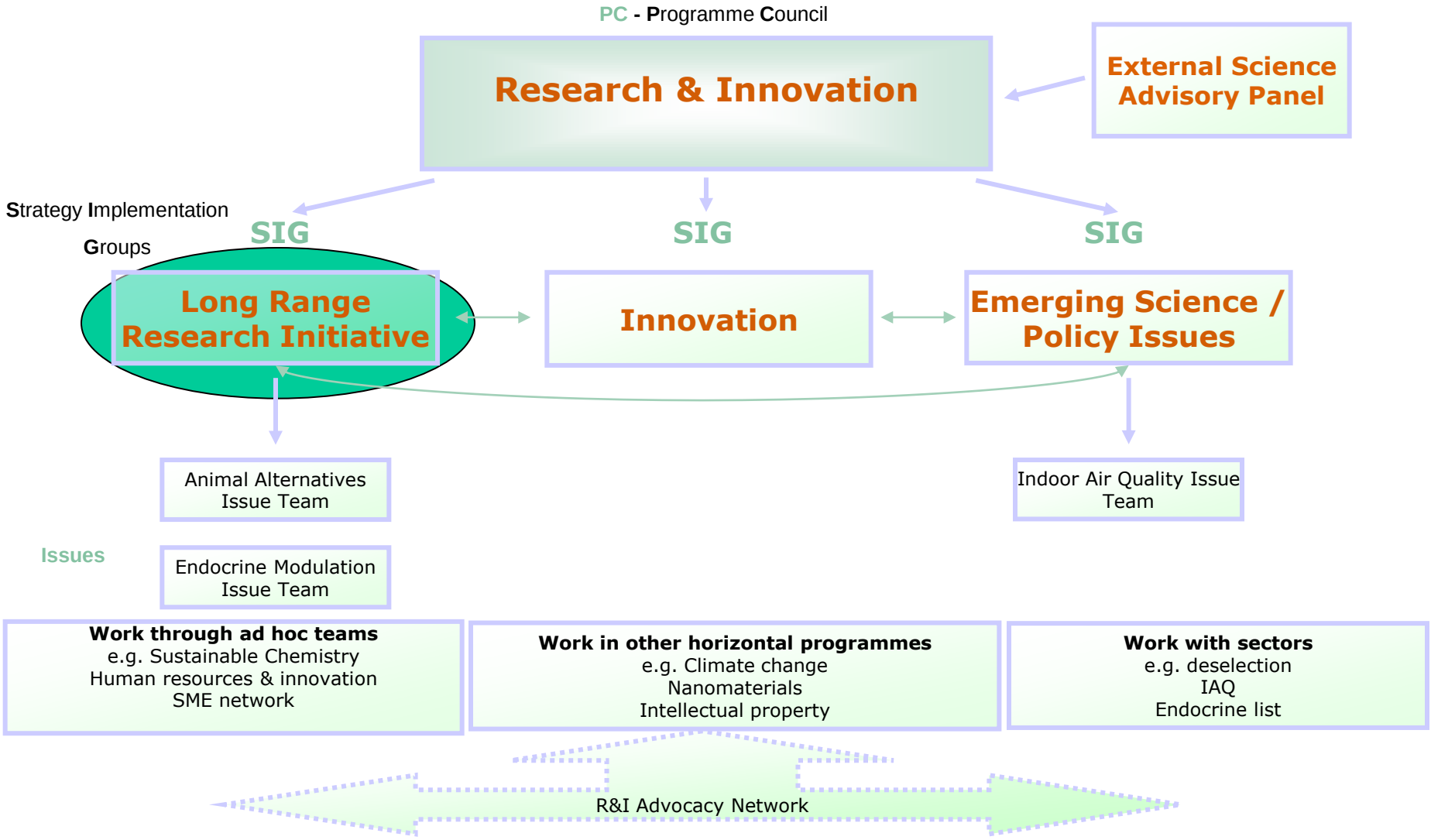
Innovation



e.g.

- EU Technology Platforms (SusChem)
- CEFIC Long Range Research Initiative (LRI)
- Environment & Health policies of EU & WHO
- European Platform for Alternative to Animal Testing EPAAI
- Implementation of regulations

CEFIC Research & Innovation – Structure



1. What is LRI? – A Global Programme

- **Commitment demonstration to Responsible Care (RC) and Global Product Strategy (GPS)**

- **ICCA-LRI: A global effort under ICCA**
  - Am.Chem.Council
  - Cefic (Europe)
  - Jap.Chem.Ind.Assoc.

What else is LRI?

- Global programme under ICCA (Europe, USA, Japan)
- **High quality research to deliver a knowledge base to ensure adequate use of Precautionary Principle and public acceptance for new technologies and products**
  = Improve chemicals management
- **Capacity building for emerging scientific issues**
- **Network of experts in industry, academia and governments/institutes**
- **Knowledge-based input into policy discussions and expected impact into decisions**

Why/How LRI?

Why: **Responsible and reliable and science based decisions in assessments for innovation**

How: **Ensure knowledge based decision making at science-policy interface for innovation**

Deliver quality research and knowledge base to ensure adequate use of Precautionary Principle and public acceptance for new technologies and products

2. What's the added value of LRI ?

- **Capacity building in industry (know-how pool) → Reality check of industry advocacy positions**
- **Early warning on new developments**
- **Network → Outreach to opinion leaders through network (multiply initial investments)**
- **Rapid response system for industry to react in "crisis"**
- **→ CEFIC as early preferred source for dialogue by decision makers**

3. 2010 updated ICCA-LRI Global Research Strategy

Long-Range Research Initiative

Global Research Strategy

21st Century Approaches to Risk Sciences

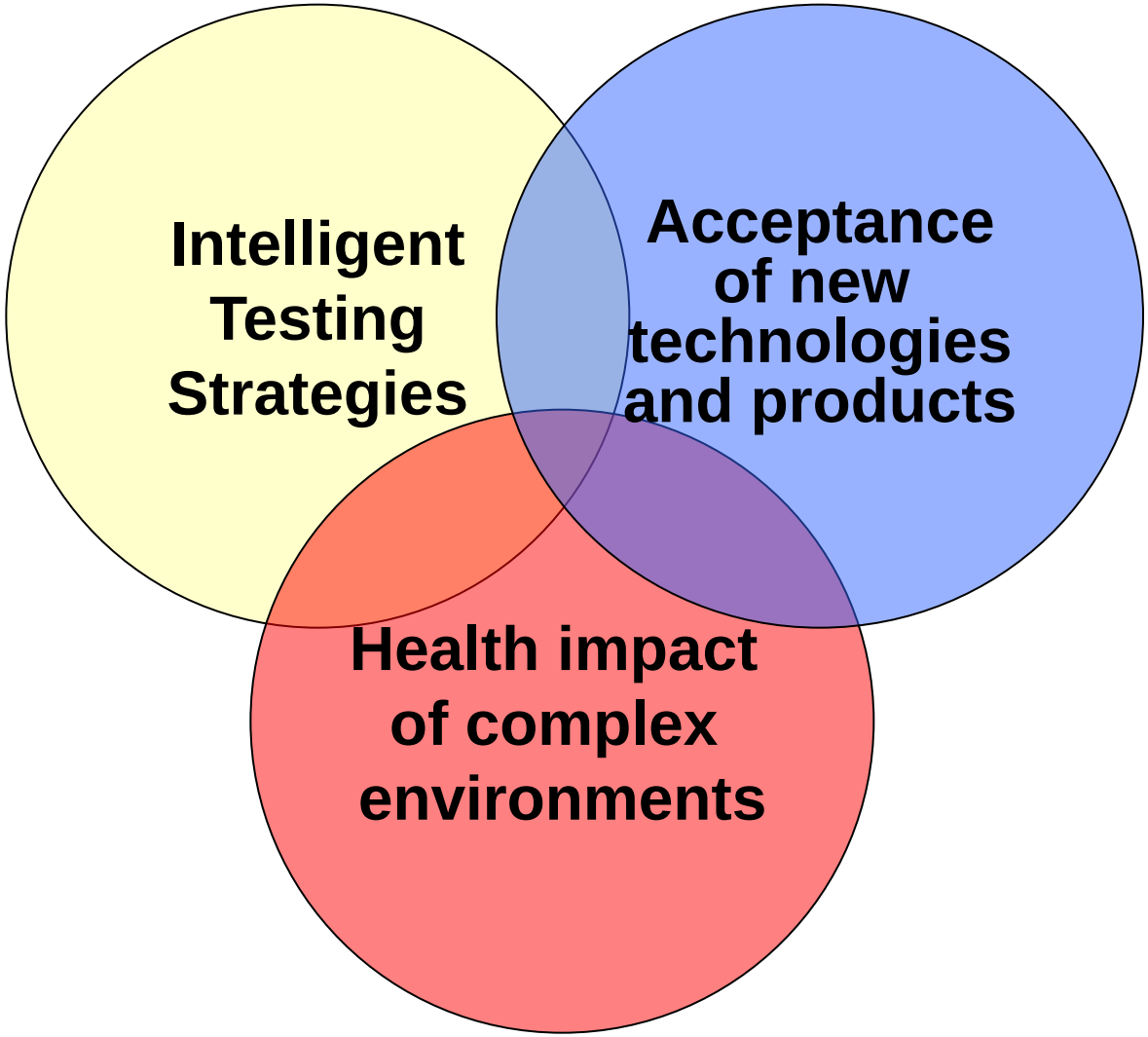
«21st Century Approaches to Risk Sciences»

- **2010 updated ICCA-LRI Global Research Strategy:**

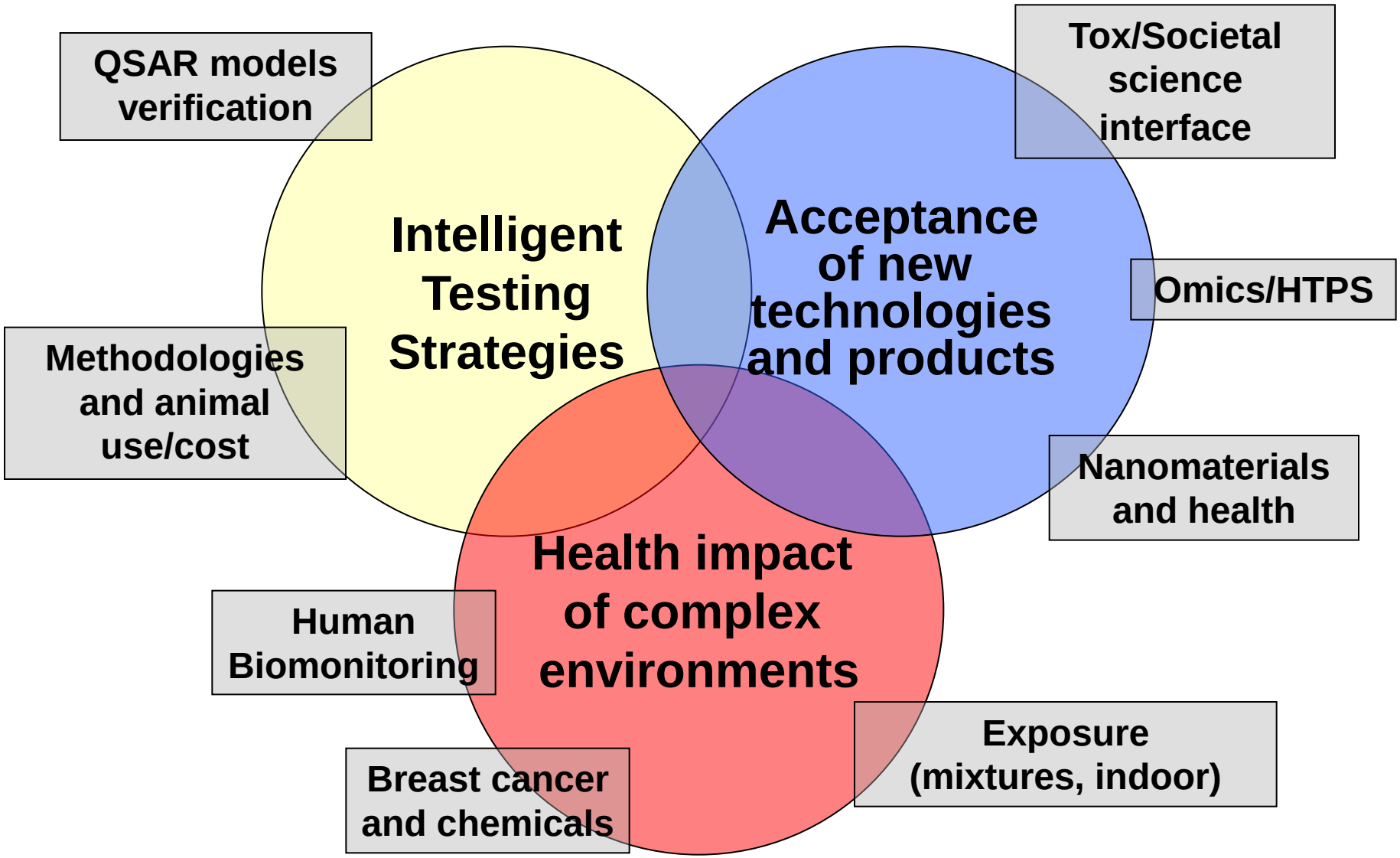
  designed to improve the quality of chemical safety assessments

  - ***Emerging Technologies*** **– Assessing innovative tools, approaches, and data for robust, timely, and resource effective evaluations of chemicals as well as new technologies, such as nanotechnology**
  - ***Exposure Science*** **– Improving the tools to quantify everyday and incidental exposures to chemicals and to guide intelligent testing and risk assessment**
  - ***Translation Relevant to Health and Environment*** **– Developing approaches and tools to improve understanding of links between exposures to chemicals and human health effects and the environment**

CEFIC LRI Strategic Themes



Areas supporting knowledge based policies



4. Critical criteria for projects

- **Relevant to strategic research areas**
- **High scientific quality**
- **Delivering in time for developments (political, regulatory, scientific)**
- **Impact on opinion formers in science**
- **Clear communication plans**
- **Issues from Cefic membership addressed**
- **Balance between different areas**

5. Process for new projects (1)

- **Call for input issued for the 2011 program to the Cefic membership**
- **Strategic research areas defined by R&I Programme Council (Feb-March)**
- **Proposals developed by cooperation of**
  -LRI Issue Management (also prioritisation),
  -Monitoring Teams,
  -ECETOC taskforces,
  -External Scientific Advisory Panel (ESAP)
- **Prioritized proposals reviewed and prioritized by LRI SIG (April-May)**
- **Priority projects recommended to the LRI R&I Board (June 6)**

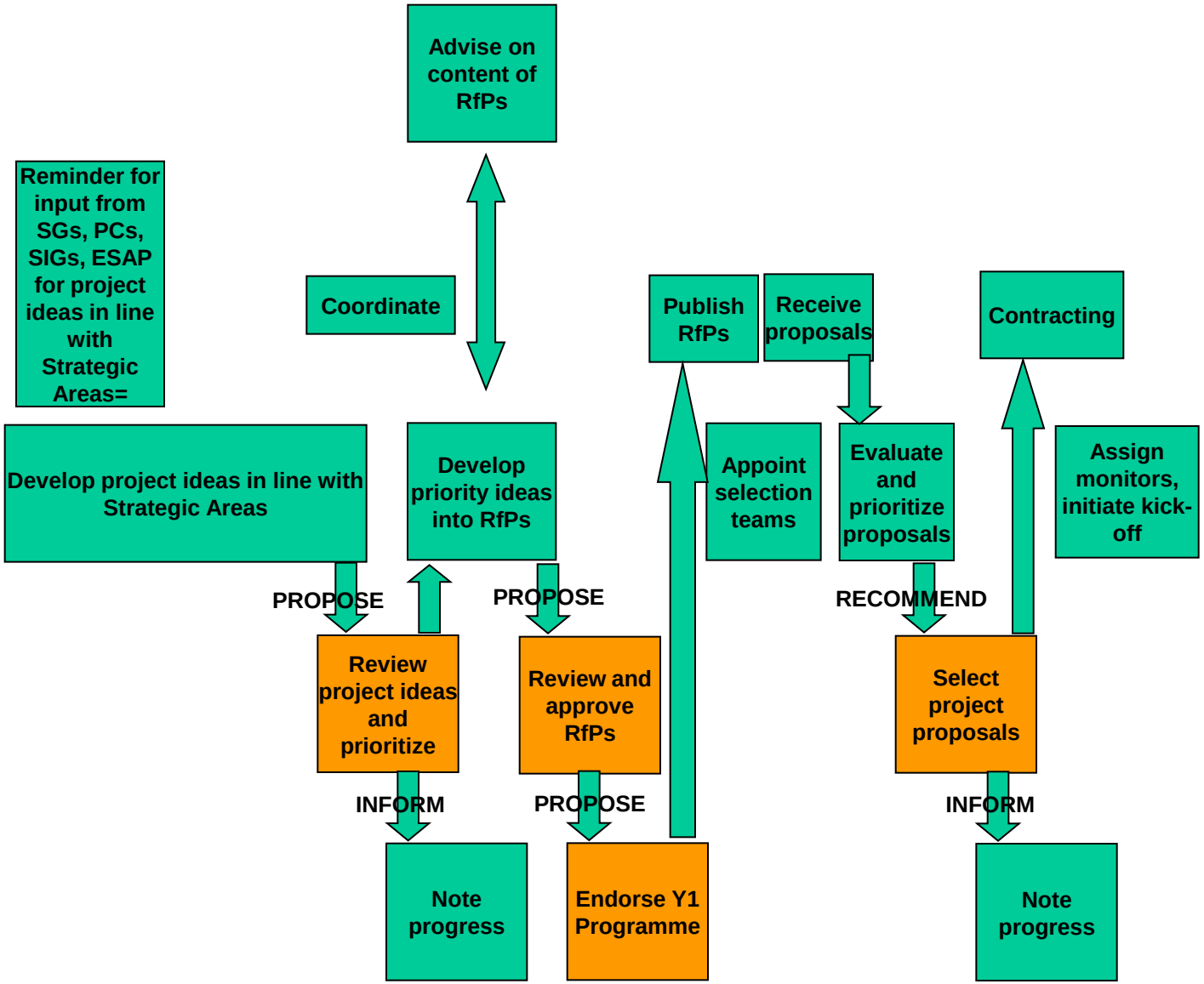
5. Process for new projects (2)

- **Broad publication of Request for Proposals (RfPs). Early/mid-June**
- **Submission of research proposals by researchers from academia, research institutes, government institutes, industry. End Aug deadline**
- **Selection with involvement from industry and non-industry experts (incl. ESAP)**
- **Contracting. November**
- **Monitoring by industry experts. Ongoing per project**

LRI Process

	YEAR 0		YEAR 1			
	Q3	Q4	Q1	Q2	Q3	Q4

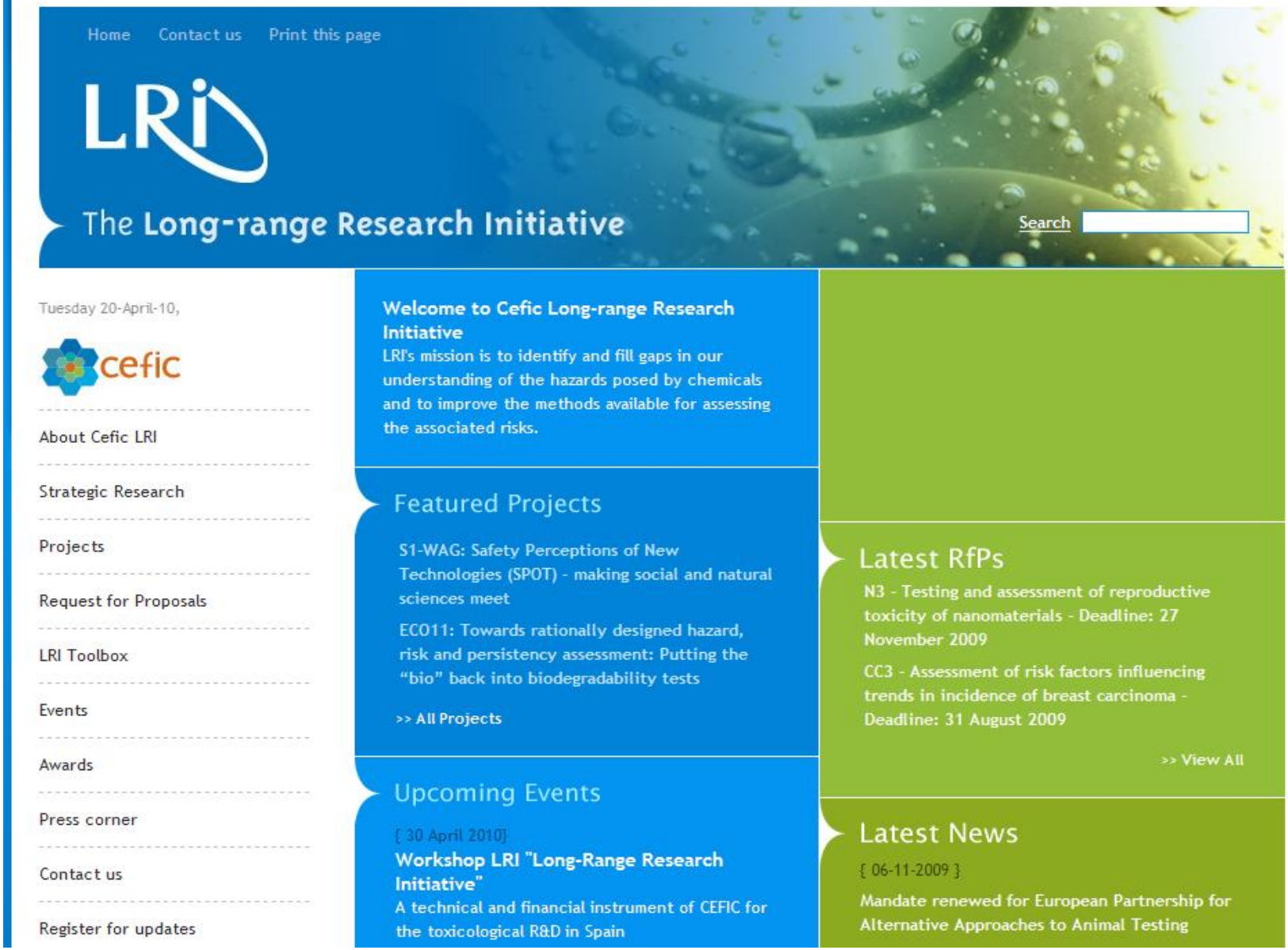
- **ESAP**
- **LRI Manager**
- **ECETOC, Issue Teams, Monitoring Teams**
- **LRI SIG**
- **R&I PC**



LRI in numbers

- **12 years existence**
- **About 4M EUR / year, 100% industry funded**
- **164 projects to date**
- **24 ongoing, about 60 FTE's**
- **2 issue management teams + several ad-hoc teams**
- **1 Strategy Implementation Group**
- **1 External Science Advisory Panel**
- **Staff of 2 (Bruno Hubesch + Maria Andrielou) + communication (Annie Mutamba)**
- ***Knowledge pool of several hundred experts***

LRI website: www.cefic-lri.org



6. Issues relevant for LRI

6. Issues relevant for LRI

- **Intelligent testing and assessment**

Animal testing in the news

EurActiv: Environment

Wednesday 27 February 2008

HOME PAGE | SUBSCRIBE | AGENDA

Revolutionary technique to speed up chemical testing

21 February 2008

The chemicals industry could soon have access to a quicker and cheaper means of testing the toxicity of chemicals as the US Institutes of Health (NIH) and the Environmental Protection Agency (EPA) have joined forces to use advances in computers, genomics and cellular biology to develop a new high-speed in-vitro testing method for this purpose.

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Testing chemicals on animals may be banned in decade

By Nic Fleming, Science Correspondent

Last Updated: 7:01pm GMT 14/02/2008

The use of animals to test the safety of chemicals such as pesticides and household cleaners could be abolished within a decade thanks to a new screening technique, scientists have said.

The new method could speed up testing, provide more accurate results and reduce costs, as well as dramatically reduce the number of laboratory animals used to discover whether such substances are harmful to humans.

Last year the number of animals used in UK laboratories increased for the fifth year running, passing through the three million mark for the first time since 1991.

advertisement

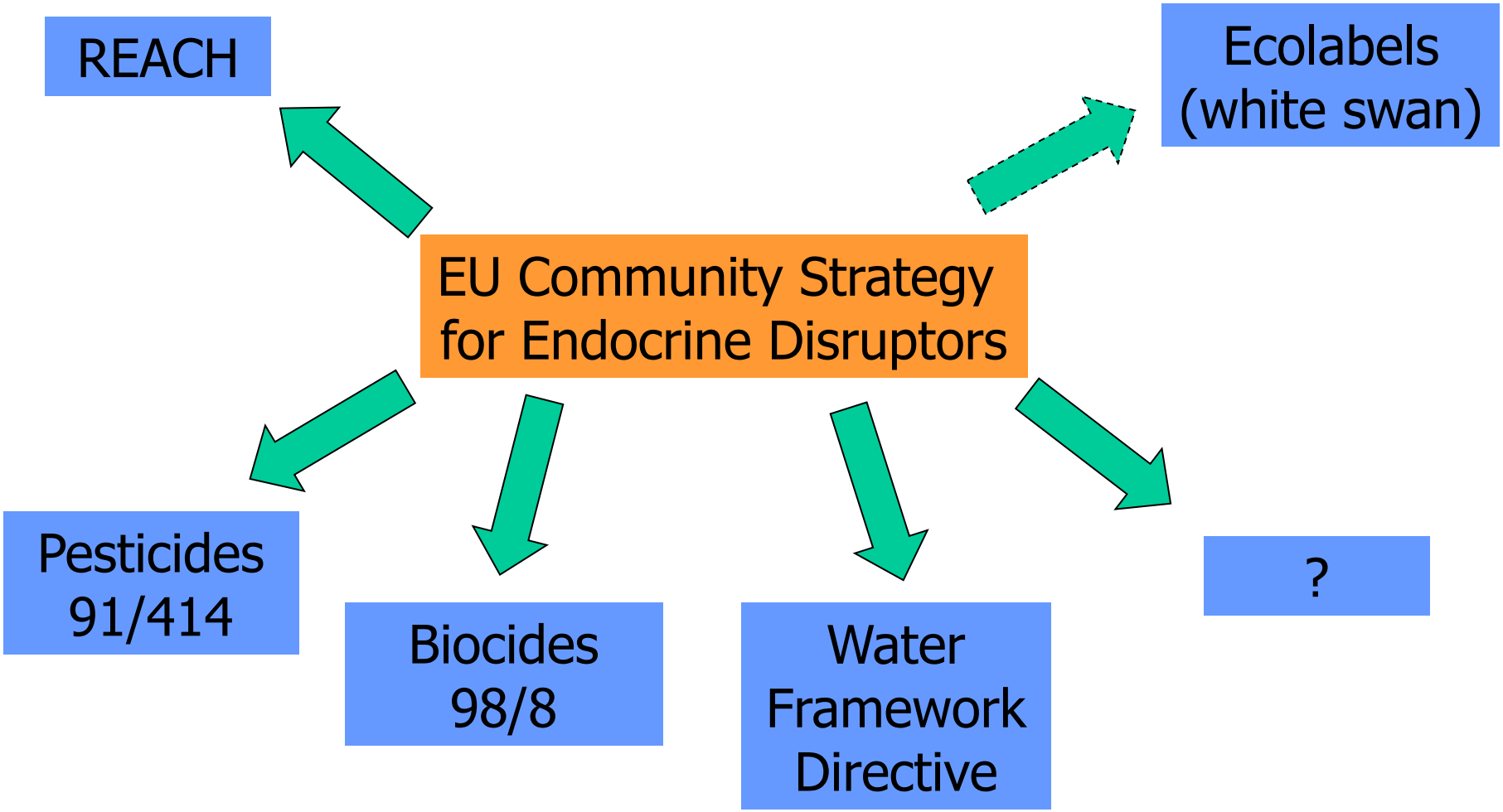
The European Union's new Registration, Evaluation and Authorisation of Chemicals (Reach) legislation, which will require the chemicals industry to test thousands of compounds for safety, is expected to boost

6. Issues relevant for LRI

- Intelligent testing and assessment
- **Endocrine disruption**

Endocrine Disruption

EU Strategy on EDs integrated in new and existing regulations



6. Issues relevant for LRI

- Intelligent testing and assessment
- Endocrine disruption
- **Human biomonitoring / Exposure**

Human biomonitoring

The cocktail of toxins within us all

She said: "I consider myself to have a healthy diet. I eat fresh vegetables, lots of fruit and very little meat. Yet last week I discovered my body is carrying a cocktail of hazardous chemicals. If I became pregnant, they could be passed on to my baby."

Journalist Lucy Johnston after having had a fat sample from her body analysed for toxic pollutants at a London-based medical laboratory. Today, every adult European has up to 500 different industrial chemicals accumulated in his or her body fat. Most of them are pesticides. Express micro edition, January 6. 2000).

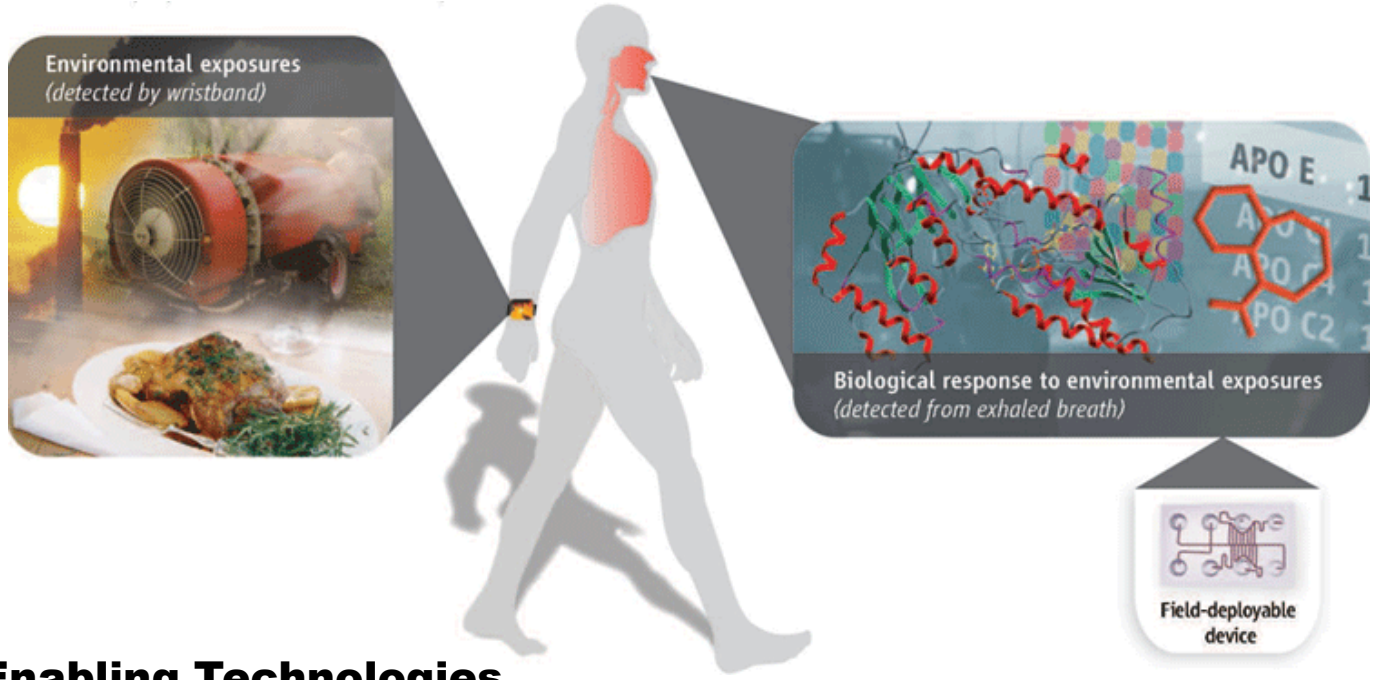
Exposure

6. Issues relevant for LRI

- Intelligent testing and assessment
- Endocrine disruption
- Human biomonitoring
- **Future assessment schemes**

Biomonitoring In The Future – Measuring Every "Little" Thing

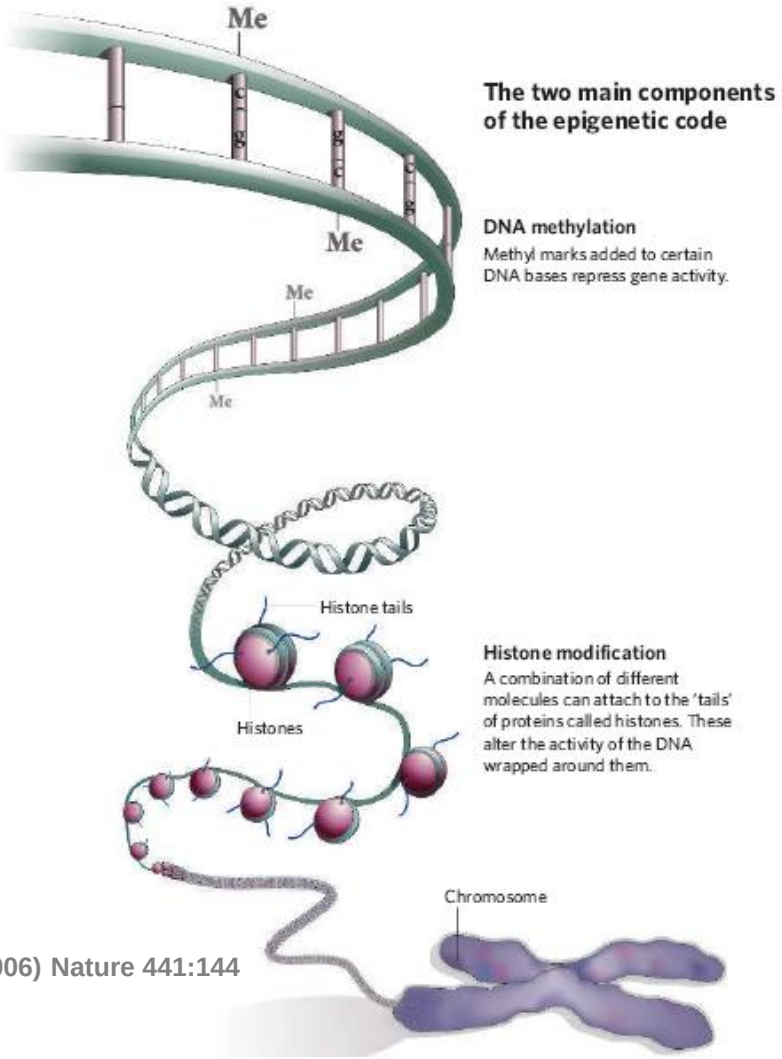
- **National Institutes of Health announced "Gene-Environment Initiative" to identify how genetic and environmental factors combine to cause disease**



- **Enabling Technologies**
  - **Human Genome Project – genetic code**
  - **International HapMap – genetic differences**
  - **High throughput experimentation**

From: Science May 2007

Transgenerational effects



Qiu (2006) Nature 441:144

- **Potential for transgenerational inheritance through epigenetic changes**

6. Issues relevant for LRI

- Intelligent testing and assessment
- Endocrine disruption
- Human biomonitoring
- Future assessment schemes
- **Acceptance of new technologies and products**

Acceptance?

CONSUMERS'
RIGHT TO KNOW
AND
RIGHT TO SAY NO
TO GMOs
GREENPEACE
GREENPEACE
Southeast Asia

NO GM
GREENPEAC

Eddie Bauer
What would Eddie do?

6. Issues relevant for LRI

- Intelligent testing and assessment
- Endocrine disruption
- Human biomonitoring / Exposure
- Future assessment schemes
- Acceptance of new technologies and products
- **Safety of nanomaterials**
- **Health impact of complex environment / Mixtures**
- **Indoor air quality**
- **Persistent, bioaccumulative, toxic chemicals (PBT's)**
- ***Policy shaping***

7. key LRI Highlights

- Significant impact related to **tools for Intelligent Testing Strategies** (QSAR, **AMBIT**, REPDOSE, ..) - contribution to REACH and OECD work
- Progressing potential for large reduction in costs through reduction of animal testing for multigenerational (2-gen/1-gen) **reprotoxicity** studies **–** accepted contribution to OECD work
- Direct cooperation with EU Commission to reduce/ minimize animal testing through **EPAA (Dir 86/609)**
- Substantive input on **OECD framework** for testing and assessment of endocrine disruptors

7. Key LRI Highlights

- Implementation of projects for HBM and Exposure and **joint LRI workshop with US EPA** in 2007-2009

- Official partner in **EU HBM pilot project in cooperation with 20 member states** (leverage of **€**15 Mio research)

- Received **public recognition** for initiative by industry to meet its commitments to WHO at **mid-term review** on children**'**s environment and health (2007)

8. Implementation of LRI projects: new contracts end 2009 / early 2010

The Long-range Research Initiative

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8. Outline

LRI in motion for 2009-2010 projects

- **Fitting the LRI strategy**
- **Focusing on key/pressurizing chemical policy issues**

2009-2010 LRI Projects

5 critical issues addressed

Exposure

Sensitization

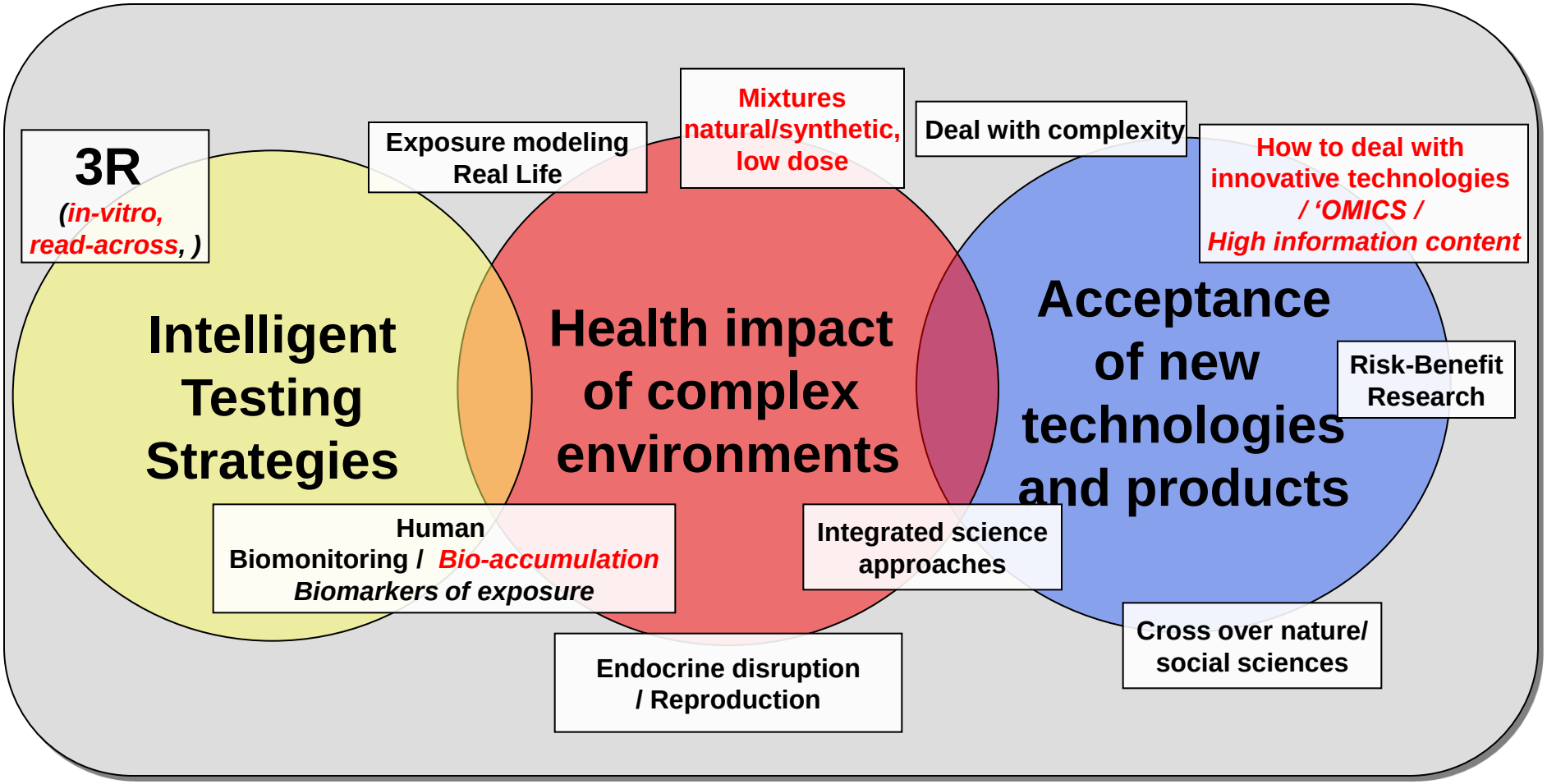
Cancer

Eco Safety

Nanomaterials

LRI new projects 2010-2011

4.2 LRI Strategic priority areas 2011 / Guidance



Progress on 2010-2011 LRI Projects

4 critical issues addressed

Eco methodology (Intelligent testing)

New tools/'omics (Acceptance of new technologies)

Mixtures in household, natural-synthetic, low dose (Complex environments)

Inhalation thresholds (ITS, Indoor Air Quality)

ECO17 – Evaluation of test methods for measuring toxicity to sediment organisms

Background

- **Lack of methods for assessing potential effects on microorganisms, plants and animals from different taxonomic groups**
- **Development of acute and chronic sediment tests covering different trophic levels and exposure pathways are needed to better define the environmental risks posed by chemical in sediments**

***Why/Policy?*: relevant for REACH revision, ECHA impact**

Objectives

- **To improve scientific understanding of sediment toxicity**
- **To develop a guidance to assist regulators in selecting ecologically relevant endponts to reflect the appropriate routes of exposure**

Cost and Timing: 3 years / € 500,000

WAGENINGEN UNIVERSITY
WAGENINGEN UR

AIMT2 – Toxicogenomics as mechanistic readouts from in vitro studies

Background

- **Toxicants elicit a characteristic pattern of gene expression which is dependent on mechanism of action**
- ***In vitro* models vs whole animal models may be able to provide comparable information**

***Why/Policy?*: both human/eco testing, reduction of animal testing**

Objectives

- **To investigate the use of toxicogenomic signatures as indicators of mechanisms of toxicity**
- **To demonstrate the utility of *in vitro* toxicogenomics in a predictive fashion**

Cost and Timing: 3 y/€ 500,000

EMSG55 – Comparison of natural and synthetic endocrine active compounds

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Background

- **State-of-the-art Report on Mixtures Toxicity**
- **Little knowlegde about the contribution of natural substances to environmental endocrine disruption**
- **Most available studies are only *in vitro* studies**

***Why/Policy?*: exposure, future of RA/mixtures, REACH authorization**

Objectives

- **To identify potential endocrine activities of natural substances**
- **To suggest synthetic EAC for investigation**
- **To investigate the potential mixture effects with natural endocrine active substances on the reproduction and development of fish**

Cost and Timing: 3 years/€ 300,000

LRI
The Long-range Research initiative

CEFAS
The Centre for Environment, Fisheries & Aquaculture Science

UNIVERSITY OF GOTHENBURG

EMSG56 – Combined low dose exposure to endocrine active chemicals

Background

- **Current risk assessment methodologies insufficient to protect against combined exposure to endocrine active chemicals**
- **Hypothesis that the endocrine system is uniquely sensitive to low doses of exogenous hormonally active substances**

***Why/Policy?*: addresses EU Council decision on mixtures issue, advocacy at EC level**

Objectives

- **To explore the ability of the endocrine system to compensate below the dose causing adverse changes and whether the response is the same between synthetic and natural chemicals**
- **To examine the effects of the simultaneous exposure to different endocrine active substances by using a whole mammalian model**

Cost and Timing: 3 years/€ 600 ,000

BASF The Chemical Company

Inserm Institut national de la santé et de la recherche médicale

B7 – Determining the nature of chemical substance additivity from household consumer products

Background

- Increasing realization of the need to consider the potential exposure to a substance as a consequence of its presence in multiple sources
- Different exposure routes, time scales and frequencies apply depending on hte source

Why/Policy: mixtures high on SAICM/WHO/EU agenda

Objectives

- To provide approaches which allow for quantitative estimations of aggregate exposure as realistic as possible
- To develop strategies to contrast the outcomes of exposure estimates with real exposures
- To identify key data gaps (including data quality issues) and parameters

Cost and Timing: 3 years /€ 450,000

Radboud Universiteit Nijmegen

ETH Eidgenössische Technische Hochschule Zürich Swiss Federal Institute of Technology Zurich

rivm

B8 – Threshold of Toxicological Concern (TTC) for Inhalation Exposure

Background

- **The TTC is based on the Threshold of Regulation**
- **Consideration of chemical structure in conjunction with toxicity data**
- **Systemic exposure following topical application of cosmetic products**
- **Application to inhalation exposure and risk assessment**

***Why/Policy?*: indoor air policy, building guidance/advocacy for regulations, cy decisions on new products**

Objectives

- **To upgrade the RepDose databas on *in vivo* studies**
- **To address local and systemic effects**
- **Derivation of robust TTC values for inhalation exposure**

Cost and Timing: 1,5 year / € 250,000

Fraunhofer ITEM

HELMHOLTZ ZENTRUM FÜR UMWELTFORSCHUNG UFZ

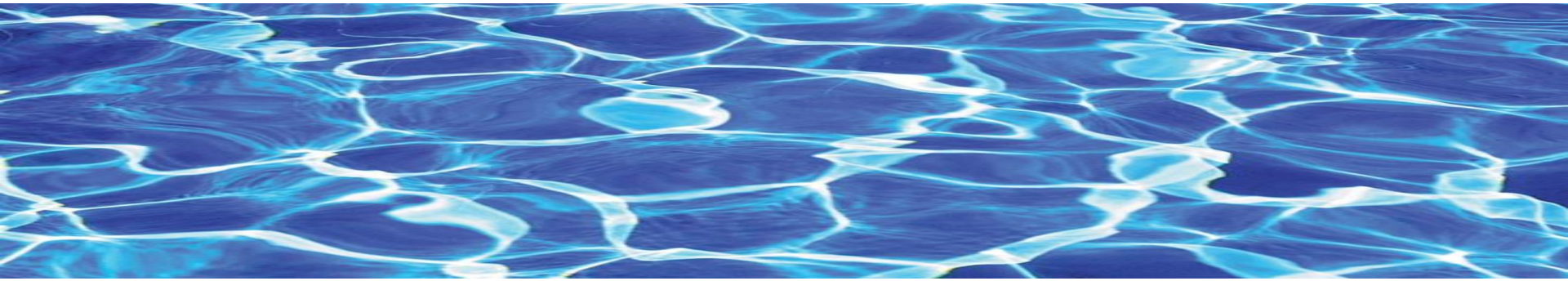
2010 New Projects Summary

LRI area	Project title
Complex environments	*1A. Natural source and their combinatory effects with endocrine active chemicals*
	1B. Combined low dose exposure to endocrine active chemicals
Acceptance of new technologies	*2A. Determining the nature of chemical substance additivity from household consumer products*
	2B. Genomics as mechanistic read-out from in-vitro systems
Intelligent testing	*3A. Evaluation of test methods for measuring toxicity for measuring toxicity to sediment organisms*
	3B. Inhalation Threshold of Toxicological Concerns (TTC)

Implementation of LRI 2010 projects

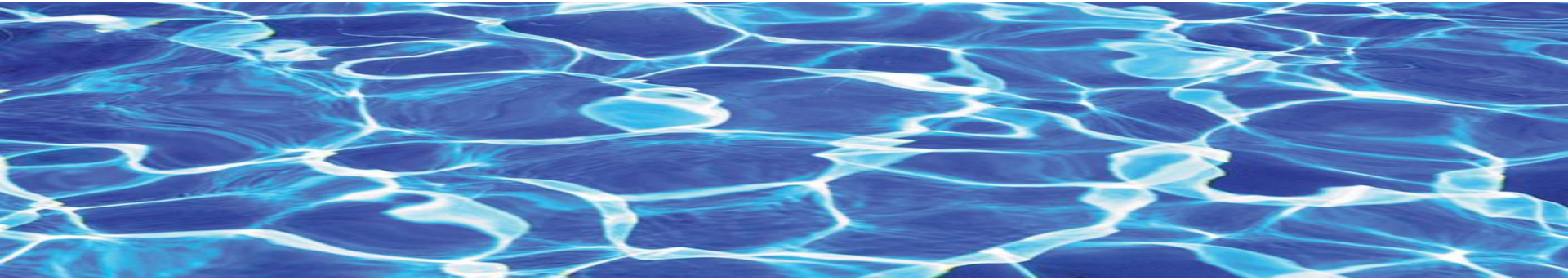
Project code	Title of proposal	Research organization	Investigator	Duration	Budget
AIMT2	Toxicogenomics as mechanistic readouts from *in vitro* studies	TNO, NL (+ Univ College Dublin, IE)	Dr Rob Stierum (+ Prof Ryan)	3y	€ 500,000
B8	Threshold of Toxicological Concern (TTC) for Inhalation Exposure	Frauenhofer Institute, DE (+ Helmholtz UFZ Leipzig, DE)	Dr Sylvia Escher (+ Dr Schuurmann)	1.5y	€ 250,000
ECO17	Toxicity measuring to sediment organisms	Univ Wageningen, NL (+ Alterra, NL)	Prof Bart Koelmans (+ Prof vd Brink)	3y	€ 500,000
EMSG55	Comparison of natural and synthetic endocrine active chemicals	CEFAS, UK (+ Univ Gothenburg, SE)	Dr Tom Hutchinson (+ Prof Backhaus)	3y	€ 300,000
EMSG56	Combined low dose exposure to endocrine active chemicals	BASF, DE (+ INSERM, Nice, FR)	Dr Steffen Schneider (+ Prof Benahmed)	2y	€ 600,000
B7	Aggregate exposure to household chemicals	ETH Zurich, CH	Prof Natalie von Goetz	3y	€ 428,100
EEM6.2	Extension: update of the GREAT-ER desktop software	Intevation GmbH, DE	Dr Frank Koormann	4M	€ 65,000
HBM2.2	Extension: human to rat-mouse PBTK-model IndusChemFate for multiple chemicals	Industox, NL	Dr Frans Jongeleen	6M	€ 56,600
		TOTAL			**€ M 2,7**

8. Communications- Acceptance of new technologies



- ***Challenge of public perception and scientific robust interpretation***
- ***Better link needed at global and regional level between academia, authorities and stakeholders.***
- ***Ensure a knowledge-based outreach to decision maker for emerging technologies and new products.***

8.1 Cefic LRI Workshop 2011 (annual reporting)



13th Event

“Resource efficiency in risk assessment”

SAVE THE DATE

Brussels, 16 (evening)-17 November 2011

Objective + Goals

“Scientific Contributions to Chemical policies”

→ Show value that LRI has created and scope future plans.

→ Communicate on the valued-added LRI programme under the financial crisis on the short/medium/long term.

→ LRI to be understood and valued by wide audience of scientists, members and stakeholders

4.3. Innovative Science Award 2011:

Rebel thinkers breaking eco-boundaries

The Long-range Research Initiative

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Annual LRI Innovative Science Award

- **€100,000 prize for early-career scientist**
- **2011 theme: *Putting ecology back in ecotoxicology***
- **Selection with:**

EUROTOX Assoc. of Eur. Toxicologists & Eur. Societies of Toxicology
SETAC Soc. of Environmental Toxicology and Chemistry
ISES Int. Society of Exposure Sciences
CHEMICAL WEEK media partner

- **Finalists presentations and award on 14 June 2011**
- **Award presented by Executive Board member of an ACOM company at annual LRI workshop**

4.3. LRI Award 2011

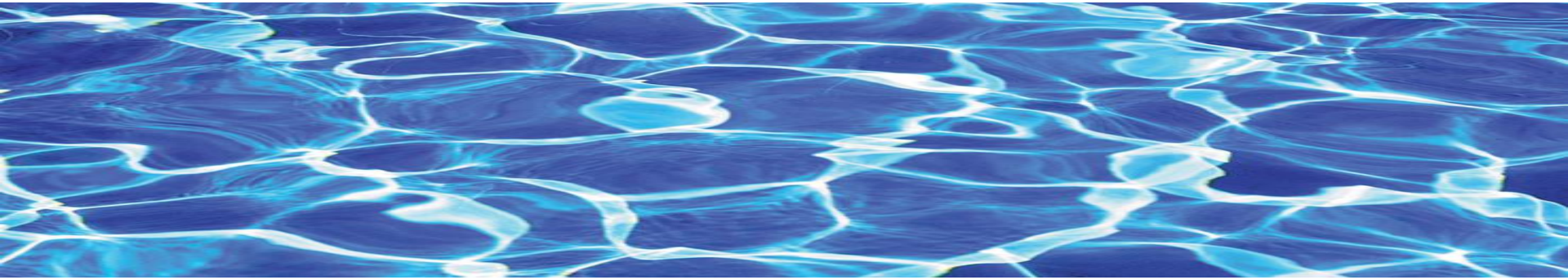
Theme: **“Putting ecology back into ecotoxicology”**

- ecological relevance / reliability in environmental RA
- interdisciplinary approaches, models/tools
- mechanism understanding of effects
- looking for new concepts for data Interpretation
- exploit field biology / lab alternatives

Dissemination and coverage via media partner chemicalweek

Presentation of award on Nov 17, 2011 (LRI WS)

ICCA- LRI & JRC Workshop 2010



« Integrating New Advances in Exposure Science and Toxicity Testing: Next Steps »

JRC
EUROPEAN COMMISSION

ICCA

16-17 June 2010

Stresa , Grand Hotel Bristol

LRI
The Long-range Research Initiative

Workshop Themes & Objectives

- **Exposure science: rapid prioritization and long-term objectives for chemical evaluation and risk management.**

- **Innovative Approaches to Generating, Integrating, and Interpreting Hazard Data: cell systems and computational analytical and integrative methods**

- **Communicating Scientific Information: development of a framework for better chemical management policies.**

ICCA- LRI & JRC Workshop 2010

ICCA-LRI & JRC WORKSHOP

Integrating New Advances in Exposure Science and Toxicity Testing: Next Steps

Register Online

Grand Hotel Bristol • Stresa, Italy • 16-17 June 2010

Integration of developments in exposure science and toxicity testing is essential for advancing knowledge-based decision making about the safety of chemicals.

The European Commission's Joint Research Center (JRC) and the International Council of Chemical Associations' Long-Range Research Initiative (ICCA-LRI) are organising a workshop that will consider application of these integrated approaches to the design, evaluation, and health risk management of chemicals. Also, this workshop will provide a venue to evaluate how communication between scientists and decision makers, and with stakeholders, including the public, can be improved to yield better chemical management policies.

A poster session will highlight relevant research.

Located in the beautiful Piedmont region of Italy, Stresa is nestled on the shore of Lake Maggiore, the second largest lake in Italy. The city offers scenic views of the Alps, elegant villas, grand hotels, and acres of flowering gardens.

For more information, please contact the ICCA-LRI Workshop Coordinator at LRI_Workshop@icfi.com.

ICCA INTERNATIONAL COUNCIL OF CHEMICAL ASSOCIATIONS

LRI Long-range Research Initiative

JRC EUROPEAN COMMISSION

WORKSHOP THEMES

- **Exposure Science.** Consider relevant research activities for addressing gaps in exposure science required to meet both immediate needs for rapid prioritization as well as longer term objectives for chemical evaluation and risk management.
- **Innovative Approaches to Generating, Integrating, and Interpreting Hazard Data.** Examine new experimental cell systems and computational analytical and integrative methods for predictive toxicology and utilization to support chemical assessment.
- **Communicating Scientific Information.** Develop a framework for a research agenda to determine how the scientific information exchange between decision makers, scientists, and the public can better meet the needs of society.

ICCA-LRI & HEALTH CANADA WORKSHOP

ADVANCING EXPOSURE SCIENCE TO IMPROVE CHEMICAL SAFETY

Evaluating risks from chemicals in everyday life requires information about both exposure and hazard. Innovations in exposure science are essential to improve exposure information for public health protection.

The International Council of Chemical Associations' Long-Range Research Initiative (ICCA-LRI) and Health Canada are organizing a workshop on improving chemical safety evaluations through innovative use of exposure science and biological and computational technologies.

This workshop will focus on increased understanding of:

- Low level chemical exposures
- Relevant windows of exposure, including perinatal periods
- Chemical mixtures, mixed exposures, and cumulative effects

A discussion session on translating science for decision making as well as a poster session highlighting relevant research will be included in the workshop agenda.

Hotel
Palace Royal

Québec City,
Canada

22-23
June 2011

QUEBEC CITY, CANADA

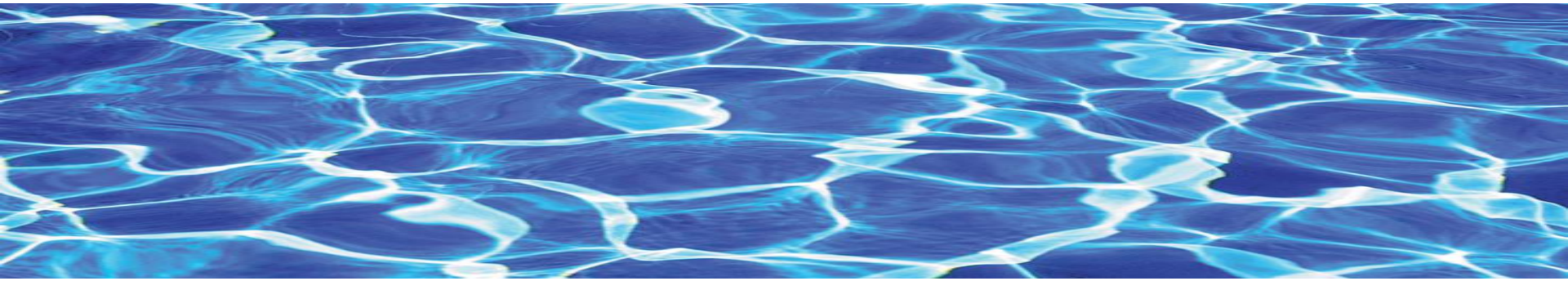
As one of the oldest European settlements in North America, Québec City is known for its quaint historic charm, winding cobblestone streets, charming bistros, vibrant festivals, and scenic views of the St. Lawrence River. This city is also the capital of the Canadian Province of Québec.

For more information, please contact the ICCA-LRI Workshop Coordinator at LRI_Workshop@icfi.com.

Health Canada Santé Canada

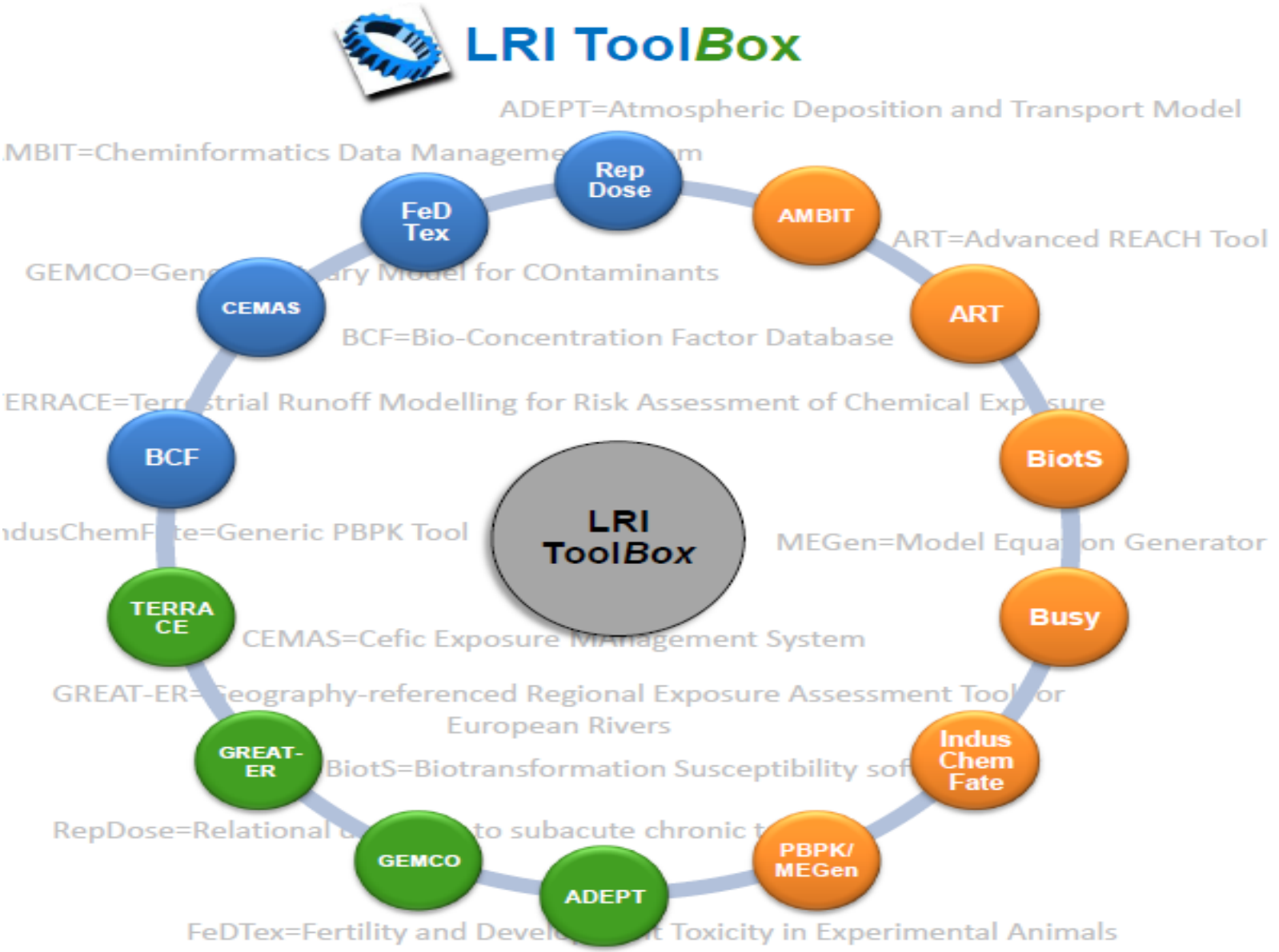
Organized by:
ICCA & Health Canada

Sell it out ! The LRI ToolBox



LRI
The Long-range
Research Initiative

The LRI Toolbox

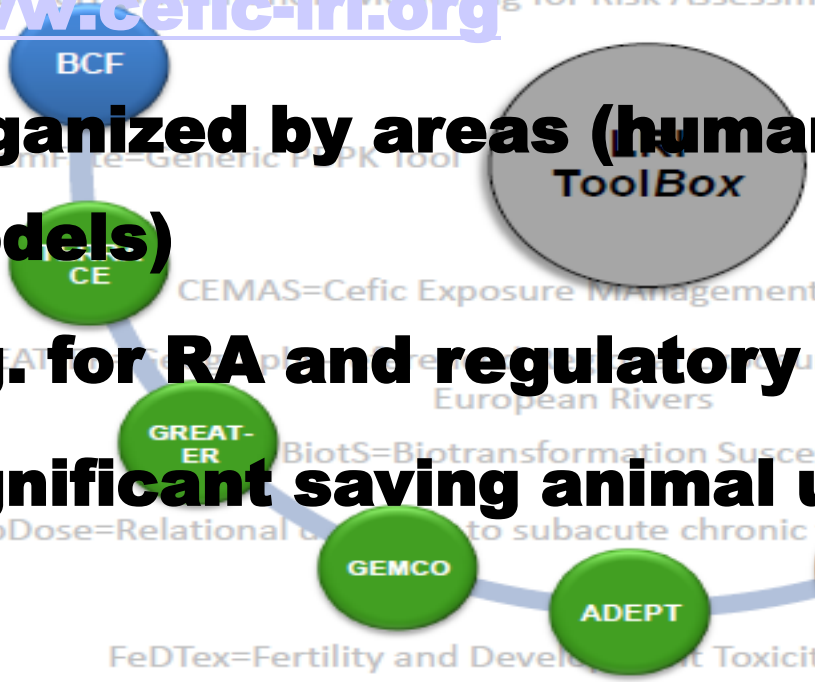


LRI Toolbox

- **Repository of 14 tools (12y research)**
- **State-of-the-art, easy to use, QA**
- **Freely available to all (web based, downloads)**

www.cefic-lri.org

- **Organized by areas (human, eco, databases, models)**
- **E.g. for RA and regulatory filing (REACH, GHS)**
- **Significant saving animal use + xxMio Eur testing**



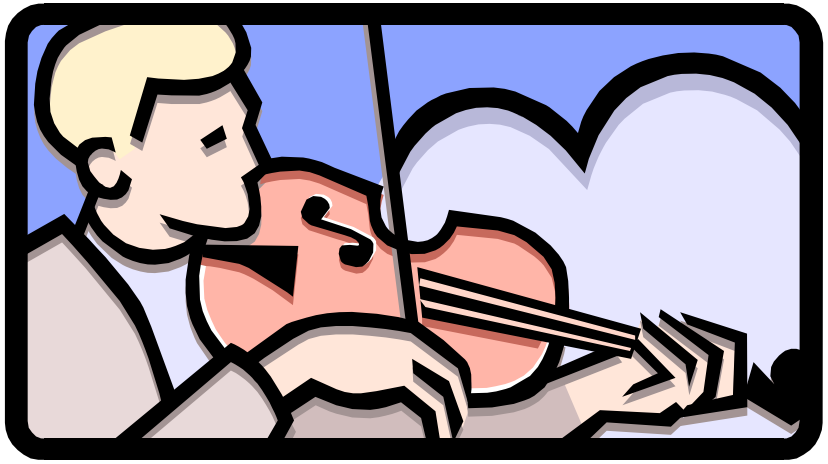
LRI Toolbox

- **Human health databases**
- **Human health models**
- **Environmental models**

9. Your role / French research capability behind LRI needs?

- **Areas where LRI needs intersect France?**
- **Issues with broad scope, multifaceted**
- **Consortia formation combining multidisciplinary expertise**
- **Awareness of LRI calls: June-July-August**
- **How to collaborate efficiently: role of UIC**

THE END



Merci !

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