The challenge of identifying endocrine disruptors

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Endocrine disruptors

Exogenous compounds or mixtures that alter function(s) of the endocrine system and consequently cause adverse effects in an intact organism, or its progeny, or (sub)populations.

- WHO/IPCS 2002

Strict EU regulation

REACH

- endocrine disrupting chemicals are considered of similar regulatory concern as substances of very high concern (SVHC)

Biocidal and plant protection products

- endocrine disrupting chemicals shall not be approved

Identifying endocrine disruptors

Criteria for regulation

Exogenous compounds or mixtures that alter function(s) of the endocrine system and consequently cause adverse effects in an intact organism, or its progeny, or (sub)populations.

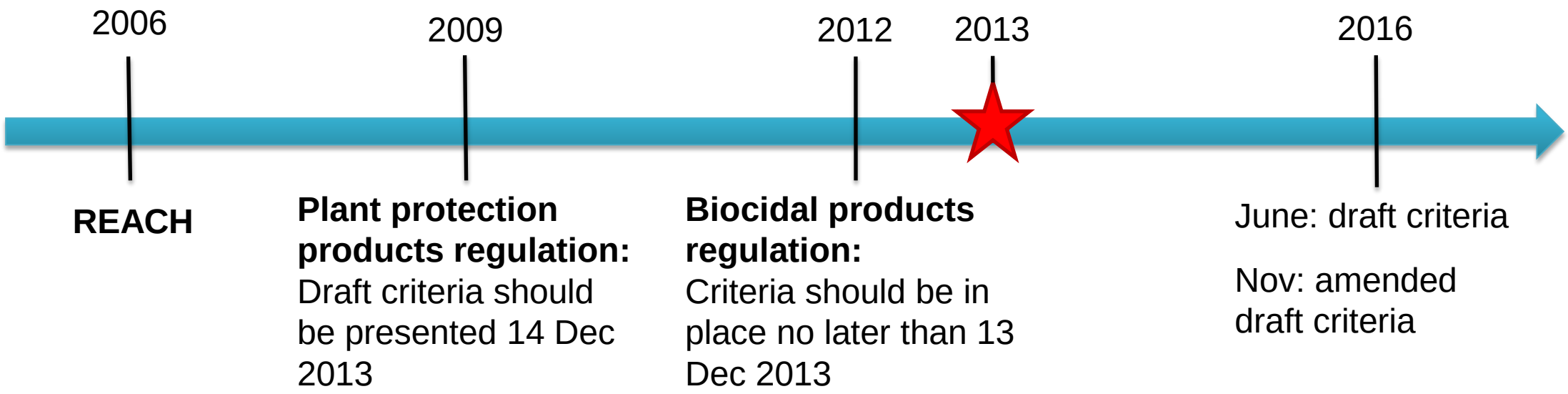
A. endocrine mode of action

B. adverse effect in an intact organism

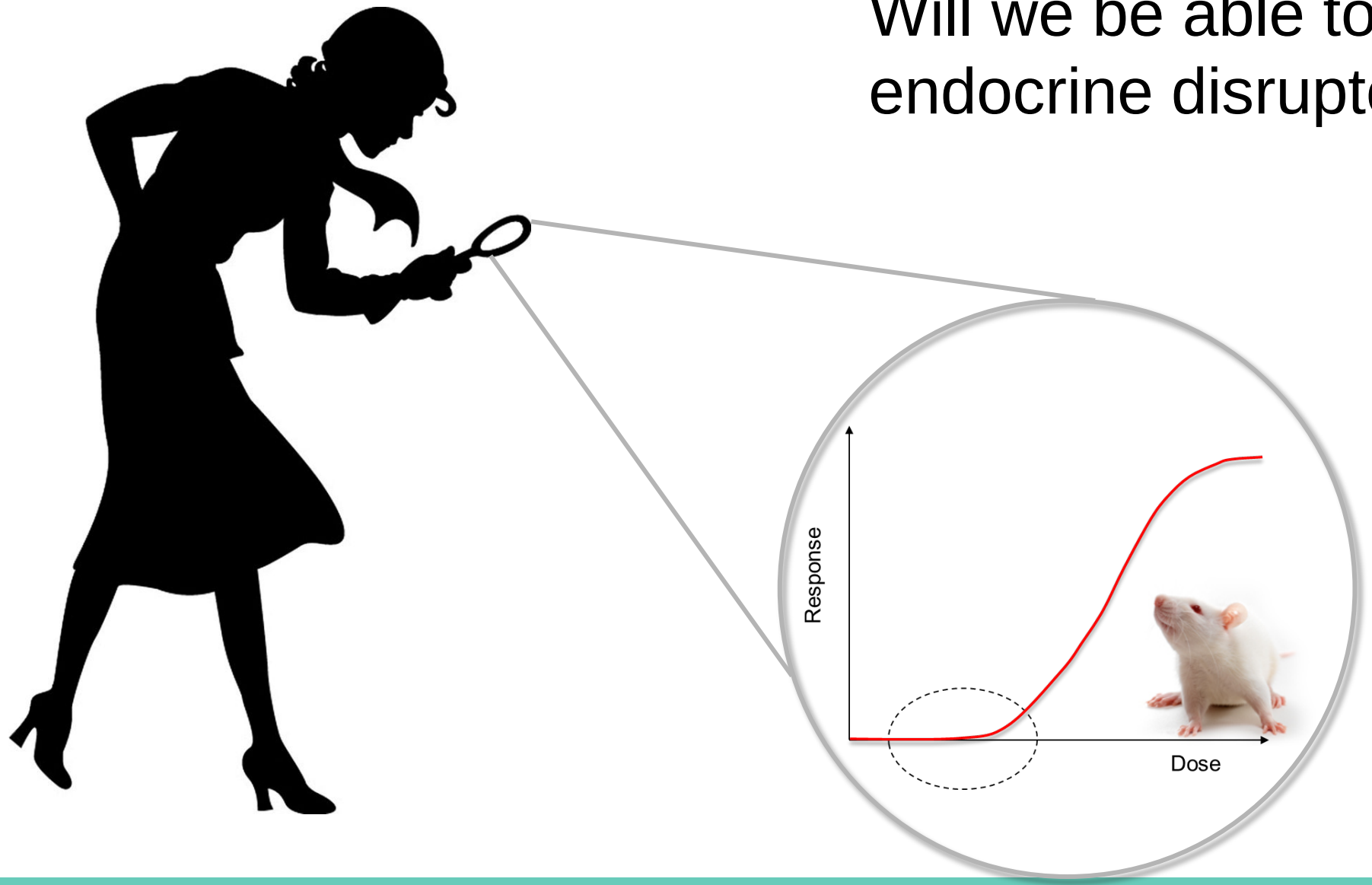
C. a causal link between A. and B.

Identifying endocrine disruptors

Criteria for regulation



Will we be able to identify endocrine disruptors?



Weight of Evidence

SYRINA – Systematic Review and Integrated Assessment

Vandenberg *et al. Environmental Health* (2016) 15:74
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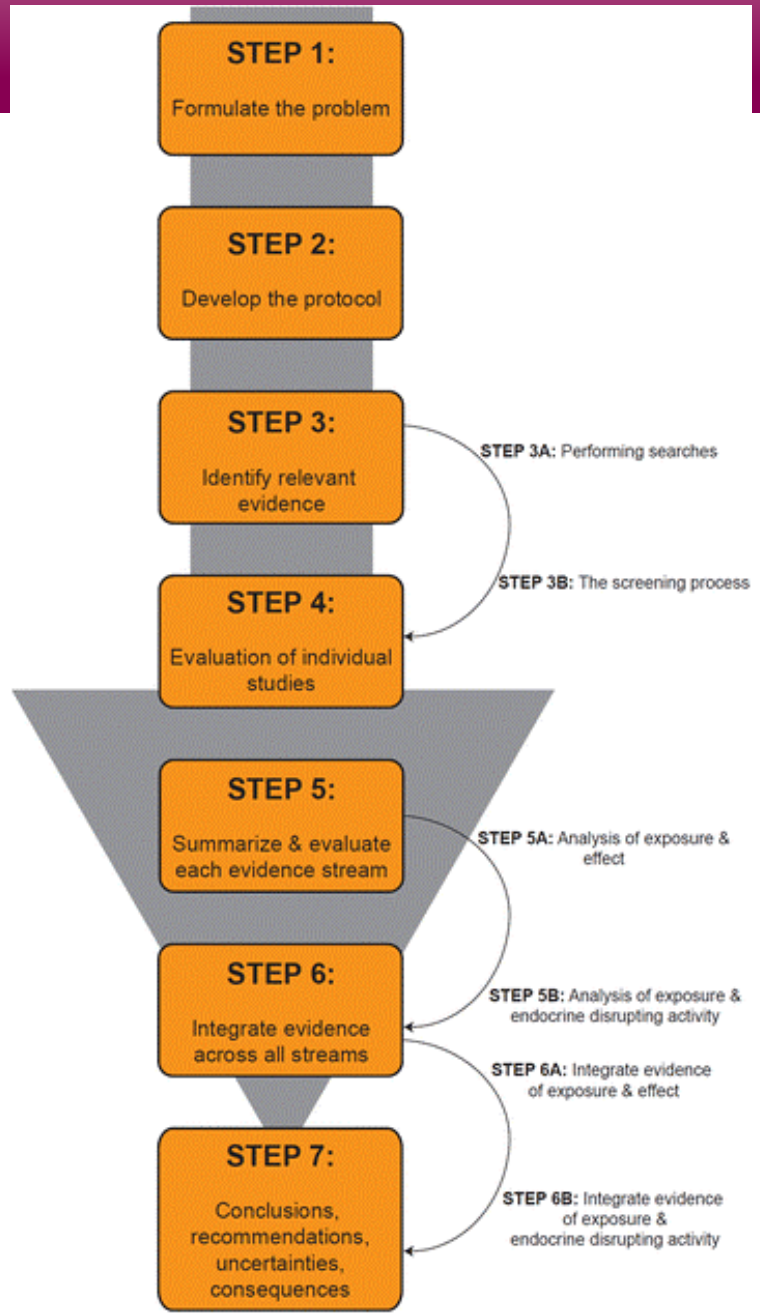
Environmental Health

METHODOLOGY Open Access

A proposed framework for the systematic review and integrated assessment (SYRINA) of endocrine disrupting chemicals

Laura N. Vandenberg[1], Marlene Ågerstrand[2], Anna Beronius[3], Claire Beausoleil[4], Åke Bergman[2,5], Lisa A. Bero[6], Carl-Gustaf Bornehag[7,8], C. Scott Boyer[5], Glinda S. Cooper[9], Ian Cotgreave[10], David Gee[11], Philippe Grandjean[12], Kathryn Z. Guyton[13], Ulla Hass[14], Jerrold J. Heindel[15], Susan Jobling[11], Karen A. Kidd[16], Andreas Kortenkamp[11], Malcolm R. Macleod[17], Olwenn V. Martin[11], Ulf Norinder[5], Martin Scheringer[18], Kristina A. Thayer[19], Jorma Toppari[20], Paul Whaley[21], Tracey J. Woodruff[22] and Christina Rudén[2*]



Vandenberg et al. 2016. Environmental Health 15:74

Using SYRINA to classify endocrine disruptors

Strength of Evidence: Endocrine Disrupting Activity					
	Strong	Probable EDC	Probable EDC	Known EDC	Known EDC
	Moderate	Possible EDC	Possible EDC	Probable EDC	Known EDC
	Weak	Not classifiable	Not classifiable	Possible EDC	Probable EDC
	No data	Not classifiable	Not classifiable	Possible EDC	Probable EDC
		No data	**Weak**	**Moderate**	**Strong**
		Strength of Evidence: Association Between Exposure and Health Outcome			

Vandenberg et al. 2016. Environmental Health 15:74

Science in Risk Assessment and Policy - SciRAP

Aims:

- to increase structure and transparency in the evaluation of reliability and relevance of (eco)toxicity studies
- to facilitate and increase the use of academic (eco)toxicity studies in regulatory risk assessment of chemicals

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Science in Risk Assessment and Policy

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Science in Risk Assessment and Policy

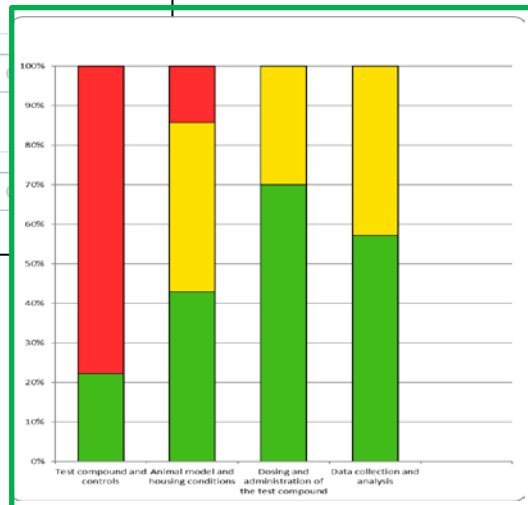
SciRAP (Science in Risk Assessment and Policy) is a web-based reporting and evaluation resource developed to facilitate and increase the use of academic toxicit
studies in regulatory assessment of chemicals. The intention is to bridge
academic research and chemicals regulation and policy.

Why is this important? There is overall a need to increase structure an
evaluation of (eco)toxicity studies for regualtory risk assessment och che
academic research studies are often given little weight as evidence in ris
reason is that they are considered insufficiently reported for regulatory

News!

We have updated the SciRAP evaluation criteria and color coding tool. Go to the evaluation pages for toxicity and ecotoxicity studies, respectively, and try

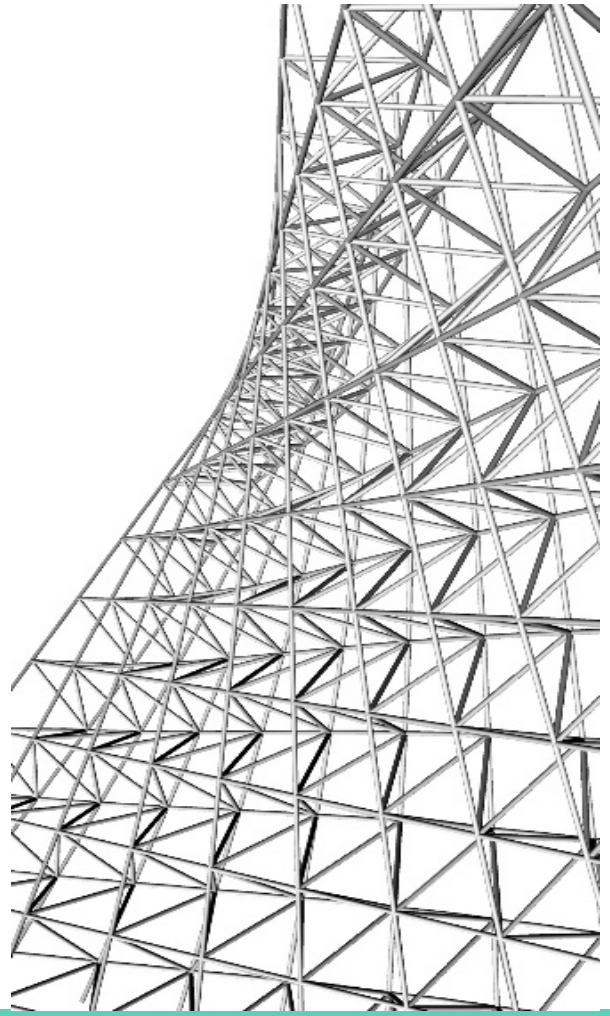
14	The allocation of animals to different tests and measurements was randomized. Guidance	Fulfilled	Comment
15	Reliable, and sensitive test methods were used for investigating the selected endpoints. Guidance	Fulfilled	Comment
16	Measurements were collected at suitable time points in order to generate sensitive, valid and reliable data. Guidance	Not fulfilled	Comment
17	A sufficient number of animals per dose group were subjected to separate tests/data collection/measurements to generate reliable and valid results. Guidance	Partially fulfilled	
18	The statistical methods have been clearly described and do not seem inappropriate, unusual or unfamiliar. Guidance	Fulfilled	



SciRAP score = 61.00

Online platform: www.scirap.org

To summarize:



- The identification of endocrine disruptors has proven complicated
  - Lack of regulatory criteria
  - Scientific uncertainties
  - Insufficient tools
  - Controversies
- Transparent and structured approaches for hazard and risk assessment is critical

Thank you for your attention!