

Skin sensitisers in cosmetic products: what is the clinical problem?

Carola Lidén

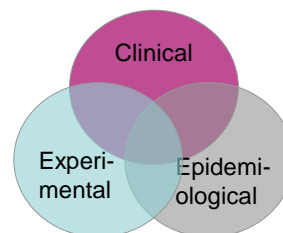
Professor, MD
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▪ Research

- Contact allergy and contact dermatitis
- Hazardous skin exposure and skin exposure assessment
- Workers and consumers

▪ Risk assessment etc.

- Skin sensitisation (EC, OECD)
- Classification and restrictions (CLP, REACH)
- CEN
- SCCP, SCCS (2004-2012)



Contact allergy

- Contact allergy
 - activation of allergen-specific T-cells
- Most frequent sensitisers
 - metals (Ni, Cr, Co), fragrances, preservatives, hair dyes, rubber chemicals, epoxy resin etc.
- 15-20% of adults are allergic to at least one substance

Diagnostic procedure

- Diagnostic patch test
 - baseline series (30 test preparations, 50 substances)
 - special series
 - serial dilutions
 - products, ingredients, extracts
- Repeated open application test (ROAT)



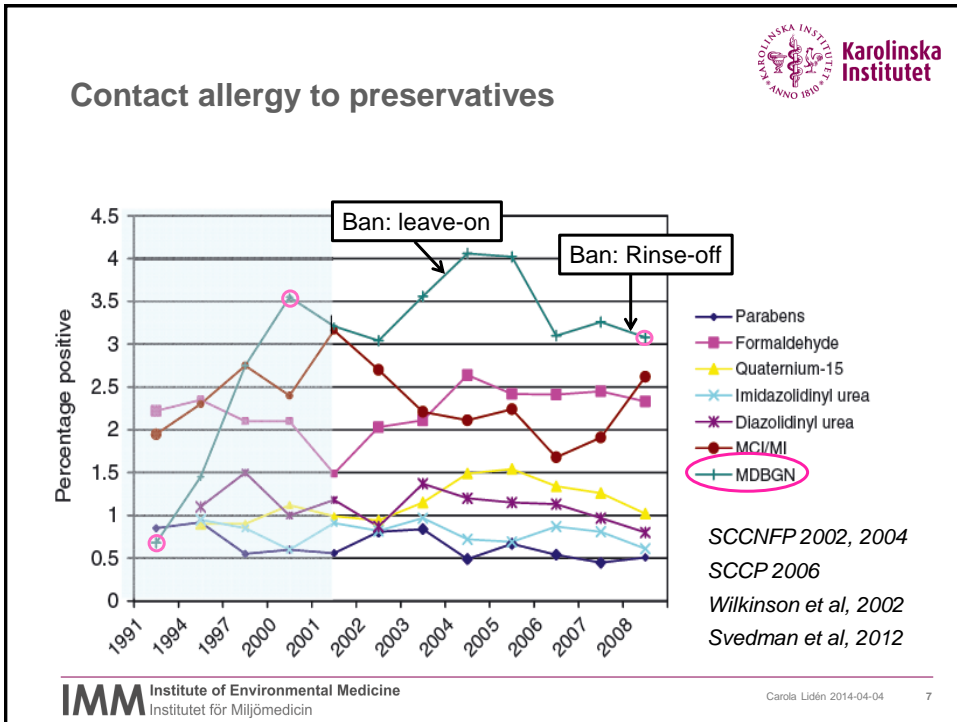
Sensitisation vs. elicitation

1. Sensitisation may be induced by
 - single exposures to potent allergens
 - repeated exposure, sometimes for decades
 - lifelong allergy

2. Elicitation of allergic contact dermatitis
 - requires significantly less exposure than induction

Preservatives

- Isothiazolinones
 - Methylchloroisothiazolinone/methylisothiazolinone (MCI/MI)
 - Methylisothiazolinone (MI)
 - Benzisothiazolinone (BIT)
- Methylidibromo glutaronitrile (MDBGN)
- Formaldehyde releasers
 - Diazolidinyl urea
 - DMDM hydantoin
 - Imidazolidinyl urea
 - Quaternium-15
- Iodopropynyl butylcarbamate (IPBC)
- Parabens



Methylisothiazolinone (MI)

- In chemical products since 2000
 - Use concentrations unknown, not classified
- Allowed in cosmetic products 2005
 - 100 ppm
- Rapid allergy increase noted since 2010
- Current alarming epidemic
- SCCS opinion 2013
 - Leave-on: no safe concentration demonstrated
 - Rinse-off: 15 ppm considered safe for induction; no information for elicitation

CN1C=CC(=O)S1

SCCS
Scientific Committee on Consumer Safety
SCCS
OPINION ON
Methylisothiazolinone (MI)
Submission II
(Sensitisation only)
The SCCS adopted its opinion on 14 February 2013
in 13 December 2013

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Alarming increase in allergy to MI

- Recent publications (examples):
 - Johnston GA et al. *The rise in prevalence of contact allergy to methylisothiazolinone in the British Isles*. Contact Dermatitis 2014
 - Lundov MD et al. *Methylisothiazolinone contact allergy - growing epidemic*. Contact Dermatitis 2013
 - Geier J et al. *Recent increase in allergic reactions to methylchloroisothiazolinone/methylisothiazolinone: is methylisothiazolinone the culprit?* Contact Dermatitis 2012
 - Hosteing S et al. *Outbreak of contact sensitization to methylisothiazolinone: an analysis of French data from the REVIDAL-GERDA network*. Contact Dermatitis 2014
- SCCS opinion on MI, December 2013:
 - http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_145.pdf

Contact Dermatitis • Original Article

COD
Contact Dermatitis

Coupled exposure to ingredients of cosmetic products: II. Preservatives

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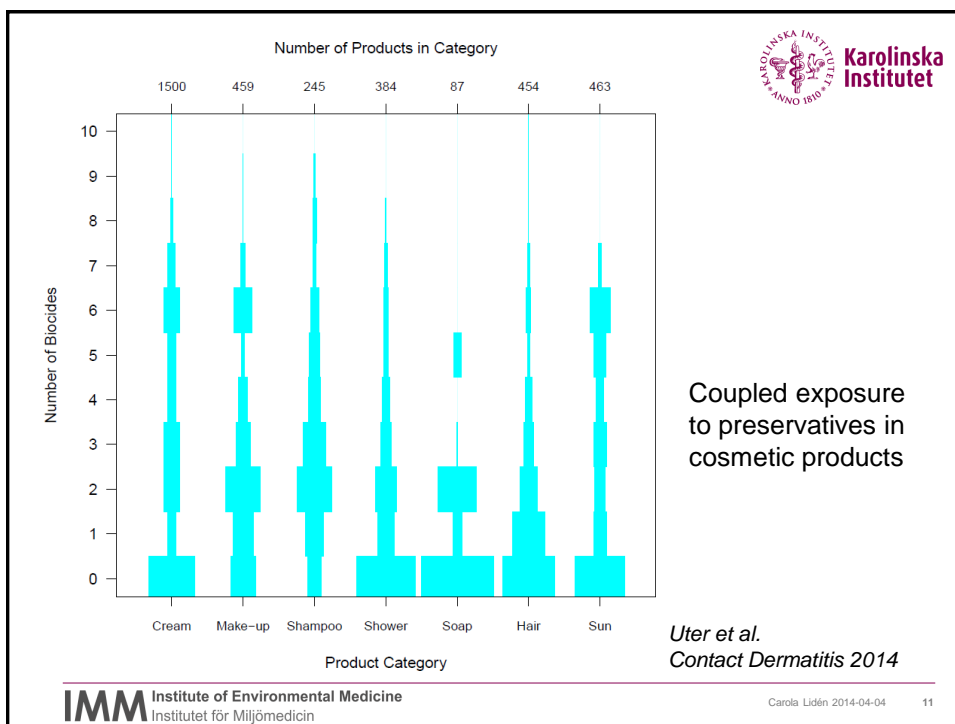
Coupled exposure to ingredients of cosmetic products: I. Fragrances

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Ingredients in 4991 cosmetic products in Germany 2006-2009



Fragrances


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Second most common group of contact allergens

- 16% of patch tested patients
 - Fragrance mix I and II
- 1-3% of the adult general population

Substances of special concern (SCCS opinion 2012)

Cinnamal	Hydroxyisohexyl 3-cyclohexene
Cinnamyl alcohol*	carboxaldehyde (HICC)
Citral	Isoeugenol*
Coumarin	Limonene (oxidised)
Eugenol*	Linalool* (oxidised)
Farnesol*	<i>*including their respective esters</i>
Geraniol*	
Hydroxycitronellal	

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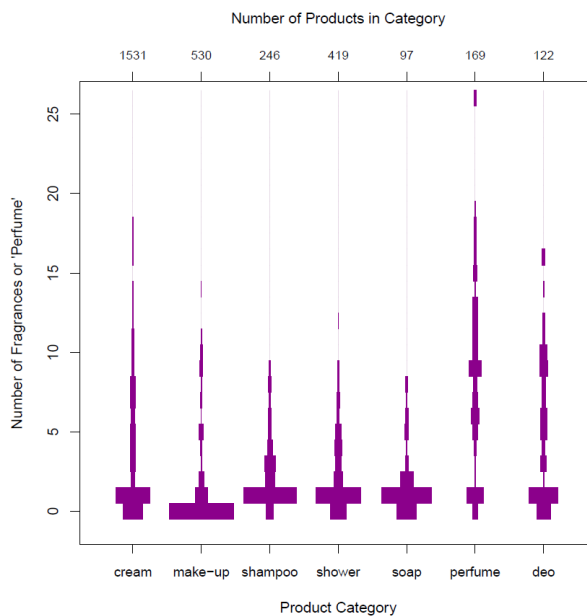
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SCCS opinion on fragrance allergens (2012)

- http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_102.pdf
- EC proposal for amendment of Cosmetics Regulation, 2014
 - additional substances for labelling in the list of ingredients
 - HICC, atranol and chloroatranol prohibited in cosmetic products
- RAC: classification of HICC as H317 (skin sens sub-cat 1A)



*Uter et al, 2013;
Karlberg et al, 2013*



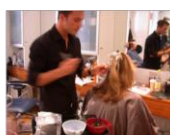
Coupled exposure
to fragrances in
cosmetic products

Linalool and
limonene most
frequent, often in
combination

*Uter et al.
Contact Dermatitis 2013*

Hair dye substances

- Hair dyeing is increasingly popular. Hair dressers and consumers develop allergy and dermatitis
- Dermatologists have focused on p-phenylenediamine
- Risk assessment has focused on possible cancer risks
- SCCP/SCCS compiled animal data on the sensitising potency of 114 hair dye substances:
 - 50% are skin sensitisers, 31% are potent (strong or extreme)



Contact Dermatitis 2009; 61: 269–275
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Potent skin sensitizers in consumer products on the Swedish market

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p-Phenylenediamine and other allergens in United States: a consumer exposure study

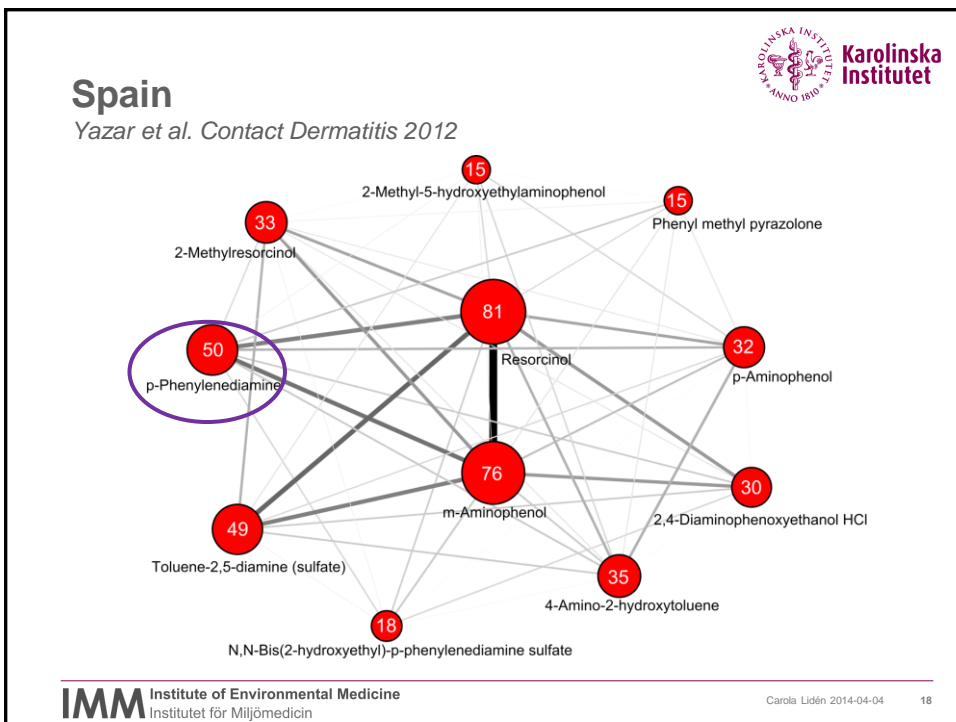
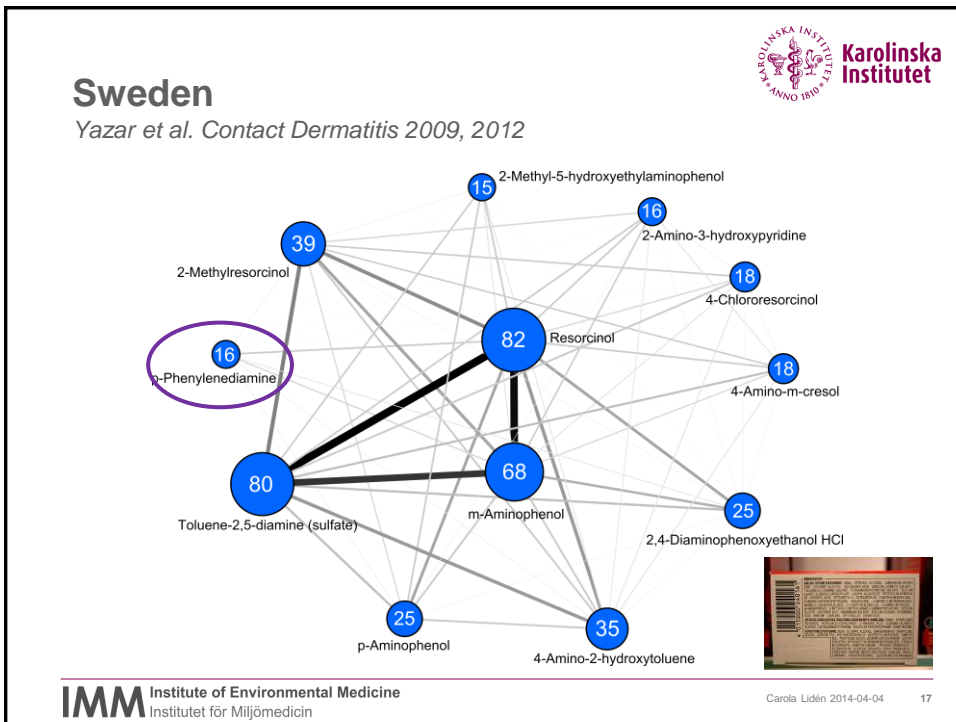
Dathan Hamann¹, Kerem Yazar², Carsten R. Hamann³, Jacob P. T. ...

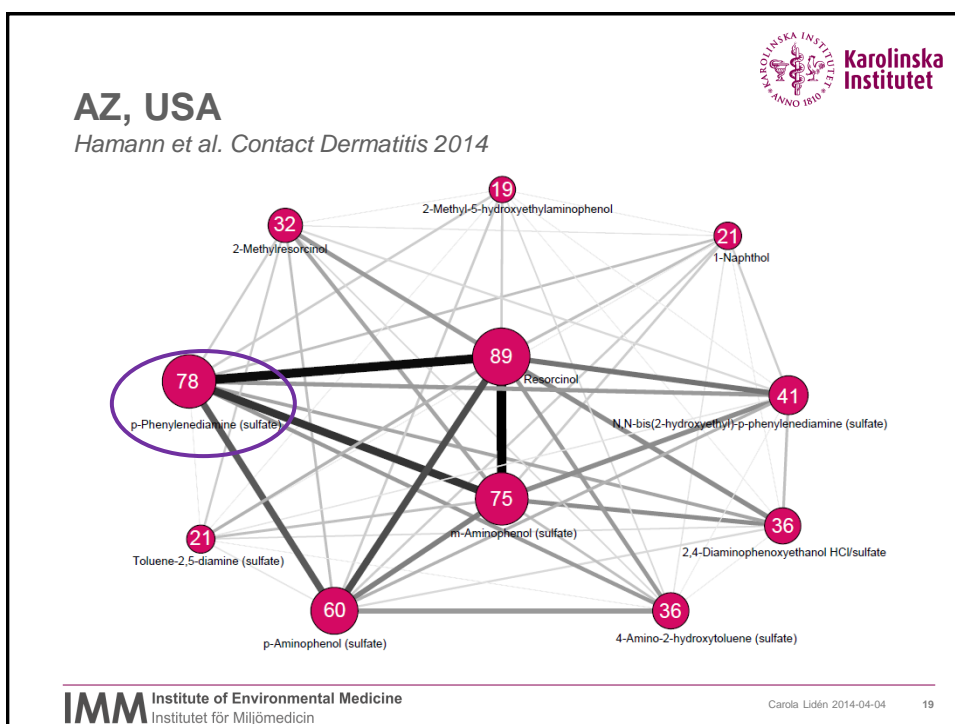
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 Danish Ministry of the Environment

Survey and occurrence of PPD, PTD and other allergenic hair dye substances in hair dyes

Survey of Chemicals in Consumer Products
 No 121, 2013



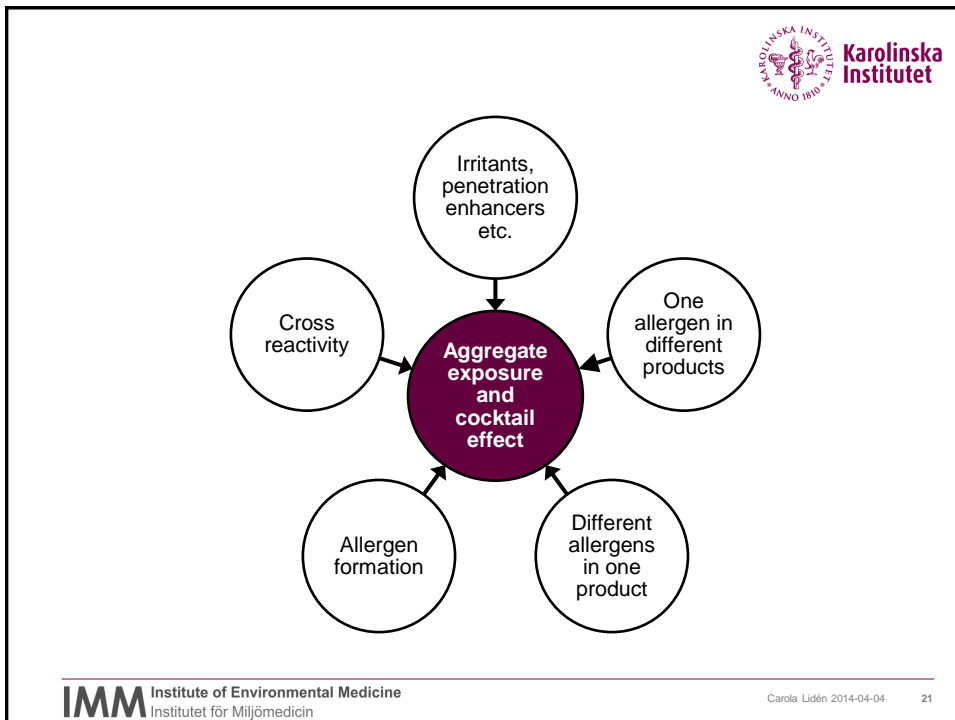


Underestimation of hair dye allergy

- Only one substance (p-phenylenediamine) in routine diagnostic patch testing
- The most frequently used dyes are not tested
- Exposure to several substances
- Some cross reactivity
- Additive or synergistic effect?

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Cosmetics Regulation:
“Cosmetic products should be safe under normal or reasonably foreseeable conditions of use”

- Cosmetic products contain many skin sensitisers
- Use concentrations are often not safe
- Consumers and occupationally exposed suffer from contact allergy to cosmetics

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Thank you

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