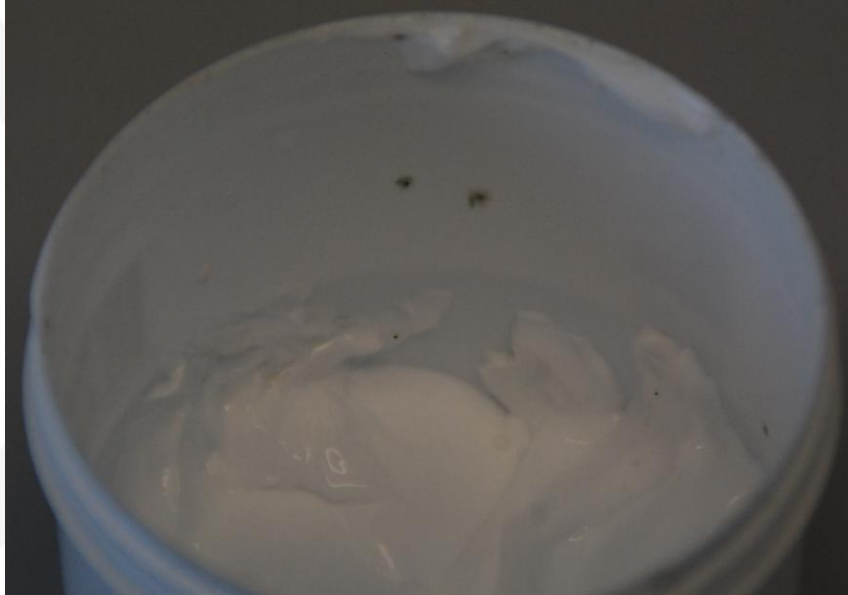




Contamination versus Preservation



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Allergic contact dermatitis to Cosmetic.

Laguna *et al.* 2009

Contact sensitivity to preservatives in the UK, 2004 – 2005

results of a multicentre study.
Jong *et al.* 2007

Moisturizing body milk as a reservoir of *Burkholderia cepacia*: Outbreak of nosocomial infection in a multidisciplinary intensive care unit.

Alvarez-Lerma *et al.* 2008

Recalls of microbiologically contaminated cosmetics in EU from 2005 to May 2008.

Lundov and Zachariae. 2008

Self-preserving cosmetics

Varvaresou *et al.* 2009

Contact Allergies to preservatives. Results of the Information Network of Department of Dermatology (IVDK) 1996 – 2007.

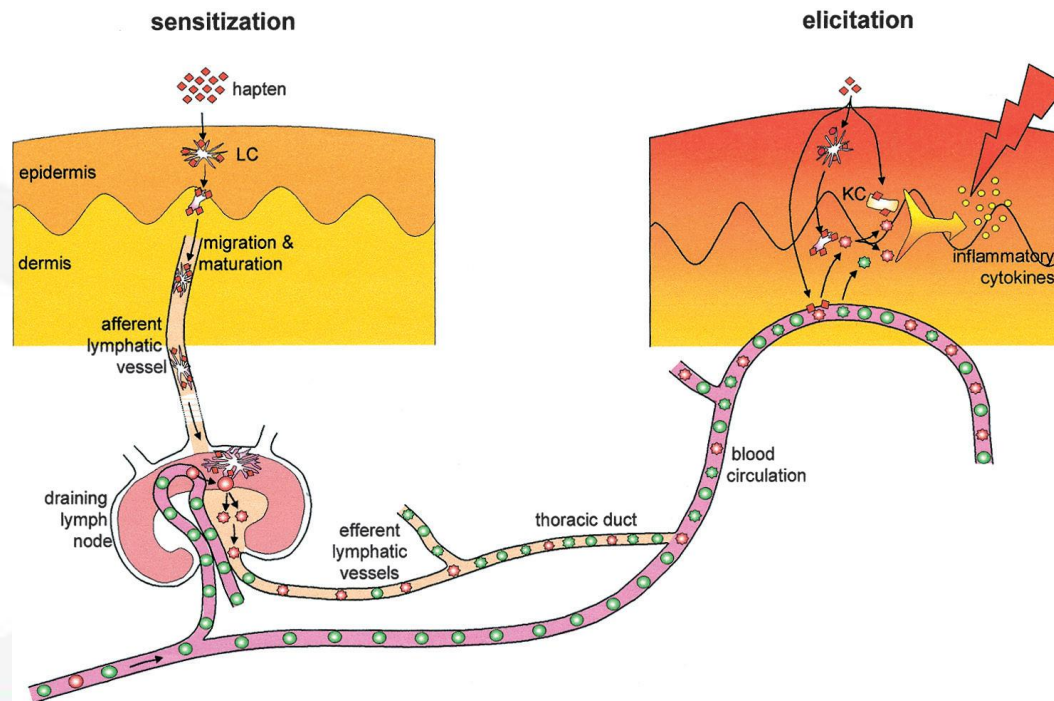
Schnuch *et al.* 2008

Preservatives systems containing essential oils in cosmetic products

Maccioni *et al.* 2002

Development of Contact allergy

- Dose dependent
 - Sensitization
 - Elicitation





Contact allergy

- Life long disease
 - Avoid the allergen for the rest of your life
- Common disease
 - 15 – 20% of the general population
- Nickel is the most predominant allergen



Contact allergy against cosmetics

- App. 6% of the general population
- Primarily fragrances and preservatives
- Epidemics
 - Formaldehyde
 - MCI/MI
 - MDBGN



Use of Preservatives

- Parabens
 - Methylparaben (42%)
 - Propylparaben (34%)
 - Butylparaben (16%)
 - Ethylparaben (14%)
 - Isobutylparaben (6%)
- Phenoxyethanol
 - app. 20%
- Formaldehyde releaser
 - Imidazolidinyl urea (8%)
 - DMDM hydantoin (6%)
 - Diazolidinyl urea (5%)
 - Quaternium-15 (2%)
- Kathon CG (MCI/MI)
 - 5%

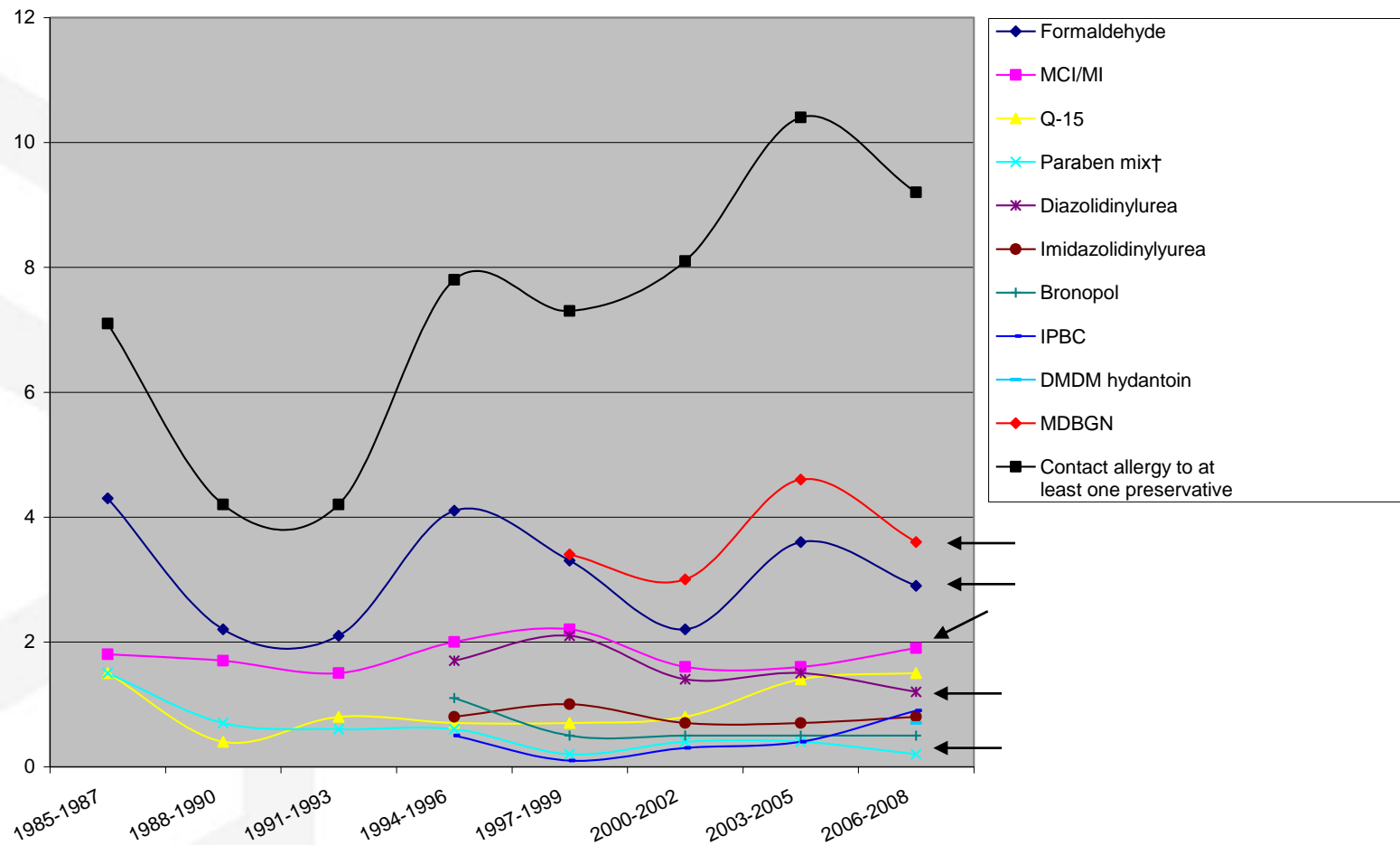


Preservatives

- Few preservatives dominates the market
 - Frequency of use is unchanged
- Alternative preservation or "free"
 - Essential oils
 - Fragrances
- Contains other potent allergenes
- Not very efficient
 - Needs to be combined with other preservatives



Contact allergy against preservatives in Denmark





Contact allergy against preservatives Europe and the US

- Germany (1996-2007) and the UK (2004-2005) almost identical prevalences
- USA (2005-2006)
 - Quaternium-15 (10,3%)
 - Formaldehyde (9,0%)



Contact allergy against preservatives

- Low concentrations can elicit an reaction
 - MCI/MI app. 2 ppm
 - Diazolidinyl urea app. 0.1%
- Formaldehyde and formaldehyde releasers
 - Often allergic to one or more releasers and formaldehyde itself



Concentrations in cosmetics

- Diazolidinyl urea
 - 0,5% allowed
 - 0,00003 – 0,5 %
- MCI/MI
 - 15 ppm allowed
 - 0,8 - 15 ppm
- Phenoxyethanol
 - 1% allowed
 - 0,023 – 0,957 %



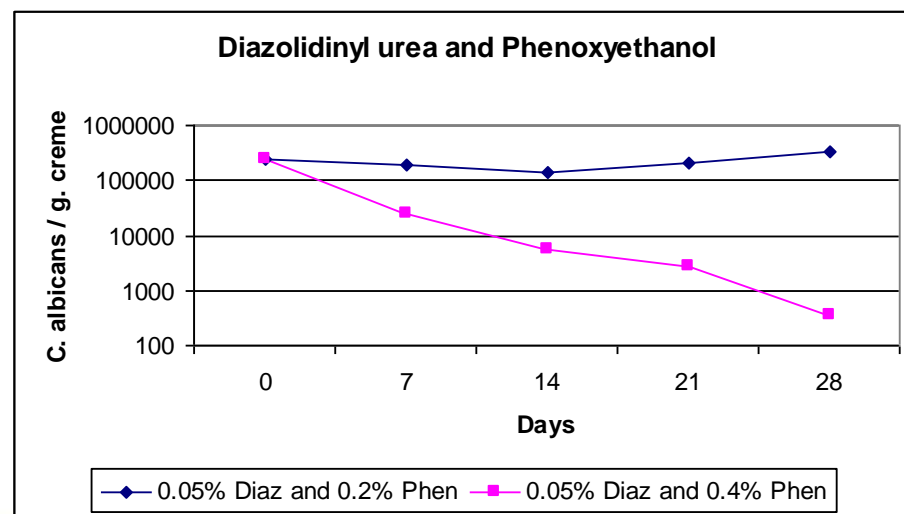
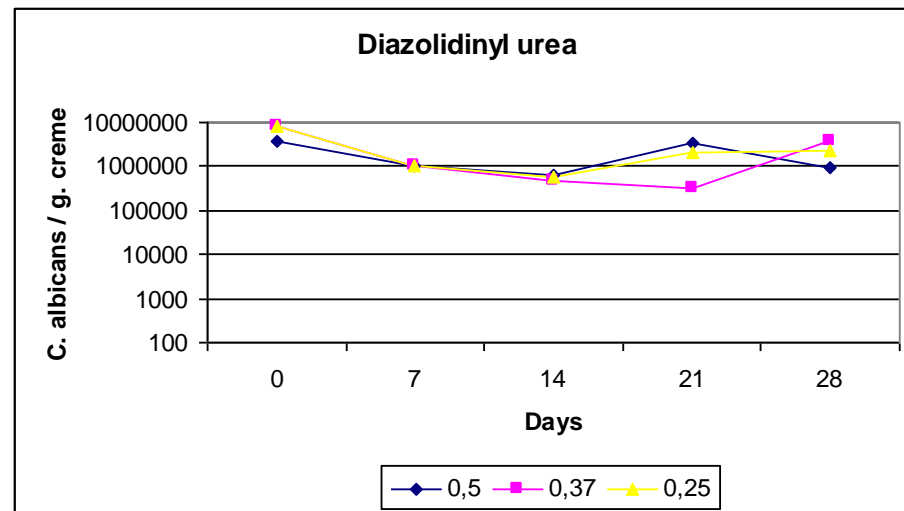
Combination of preservatives

- Many different combinations available
- Many advantages
 - Potential additive or synergistic effects
 - Wider spectrum of activity
 - Reduce the use concentration
- No information on the usage and effects of combinations



Combination of preservatives

- Challenge test in a cosmetic cream
- 0.5% diazolidinyl urea could not preserve the cream
- 0.05% diazolidinyl urea and 0.4% Phenoxyethanol





Microorganisms in Cosmetic

- Few studies on contamination
- Different results
 - few/many contaminated and varying numbers ($10^2 - 10^7$)
 - Depends often on the investigated products
- The same microorganisms dominate
 - *Pseudomonas spp*
 - *Burkholderia cepacia*
 - *Staphylococcus aureus*
- Contamination can cause infections
 - Mainly in immunosuppressed patients
 - Difficult to identify the cause in healthy individuals



Contaminated cosmetics

- 15 different creams from 10 handeczema patients
- 67% contaminated
 - *Staphylococci spp.*
 - *Bacillus*
 - *Yeast*
- Isolates from the skin



Growth of microorganisms in cosmetics





Final remarks

- Contact allergy against preservatives is more frequent today
- The same preservatives has dominated the market for several years
- Natural preservatives contains other allergenic compounds
- Lower use concentrations of preservatives could reduce the number of contact allergy reaction
- If not adequately preserved, risk of contamination



Thank you

www.videncenterforallergi.dk

www.allergyresearchcentre.com

www.kosmetikindhold.dk