

## Dermatoses

**1605 APPLICATION OF BIOMARKERS IN WORK-RELATED CONTACT DERMATITIS**

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**Aim of special session** Understand the role of biomarkers for early interventions in occupational health settings

Work-related contact dermatitis represent a substantive part of occupational diseases in many countries of the World. They cause extensive suffering for the affected workers and represent a huge socio-economic burden. Selection of appropriate biomarkers, including those involved in skin barrier and inflammation, can provide the basis for early, health-protective interventions in occupational health settings. Furthermore, they allow identify new potential therapeutic targets, aid diagnostics and monitoring of therapy and interventions to improve workers' skin health

**1605a INDIVIDUAL SUSCEPTIBILITY TO WORK-RELATED CONTACT DERMATITIS**

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**Introduction** Contact dermatitis (CD) is the most common cause of occupational skin diseases, especially in occupations such as nursing, hairdressing, metalworking and construction industry. Environmental exposure and personal susceptibility both contribute to its development.

**Methods** Recent studies on phenotypic and genotypic factors which might modify risk for irritant- and allergic contact dermatitis (resp. ICD and ACD) will be addressed.

**Results** Polymorphisms in several candidate genes responsible for skin barrier, immune response and metabolism showed to play a role in individual susceptibility to CD. Next to genetic factors, a history of atopic dermatitis and filaggrin loss-of-function mutations have been confirmed as major risk modifying factors for ICD. Association between atopic dermatitis and filaggrin mutations with ACD is less clear which might at least partly be assigned to differences in study design e.g. choice and definition of phenotype, investigated contact allergens, and population size. E.g. the effect of filaggrin mutations seems to be allergen-specific. Several studies suggested polysensitization as a phenotype for increased susceptibility to ACD.

**Discussion** Advances in our knowledge on the mechanisms underlying CD initiated a large number of studies searching for candidate genes that might modify the risk for ICD and ACD. Future studies are warranted to investigate whether genetic and phenotypic factors shown to be related to individual susceptibility are specific for a certain skin irritant or contact allergen and further evaluate their suitability in clinical practice.

**1605b FILAGGRIN DEGRADATION PRODUCTS AS A BIOMARKER OF IRRITANT- AND ALLERGIC CONTACT DERMATITIS**

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**Introduction** Filaggrin, a structural protein of the uppermost skin layer, stratum corneum (SC) plays an important role in aetiology of contact dermatitis (CD). Filaggrin contributes to the mechanical strength of the skin while its degradation products are major constituent of natural moisturising factors (NMF) responsible for adequate skin hydration. The major determinant of NMF in the skin are mutations in the filaggrin gene, a known risk factor for occupational contact dermatitis. Next, NMF can be affected by dermal exposure to skin irritants or contact allergens. The levels of NMF might therefore serve as a biomarker of individual susceptibility or to assess skin damaging effect of irritants and allergens.

**Methods** In experimental studies in humans, the levels of NMF components in the SC were determined before and after exposure to common skin irritants (SLS; n-propanol, acetic acid and NaOH) and contact allergens (Cr, Ni, MCI/MI and PPD).

**Results** All skin irritants led to significant decrease in NMF levels in the SC while among contact allergens this effect was observed only by MCI/MI.

**Discussion** Decrease in NMF levels indicates damage of the skin barrier which occurred after dermal exposure to both, contact allergens and irritants. Therefore, NMF might be a useful biomarker to detect early effects associated with dermal exposure to chemicals in occupational settings. Furthermore, NMF might be useful to identify skin damaging properties of contact allergens.

**1605c INDIVIDUAL SUSCEPTIBILITY FOR OCCUPATIONAL SKIN DISEASES IN METAL WORKERS**

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**Introduction** Occupational contact dermatitis (OCD) is one of the most frequent occupational diseases worldwide and very common among metal workers. The burden of disease is high due to its often chronic course and a high risk of work absenteeism and unemployment. The prerequisite for the development of OCD is work-related exposure to irritants and/or allergens. However, endogenous factors may increase the individual susceptibility and interfere with preventive interventions.

**Methods** A prospective controlled intervention study has been initiated in metal apprentices with annual follow-up assessments over three years. The apprentices in the intervention cohort received specific health education on prevention of OCD at the beginning of their training. Saliva and stratum corneum samples were taken for genotyping and analysis of phenotypic biomarkers, including assessment of epidermal