

## The FRAGRANCE ALLERGY Project:

# Fragrance chemical allergy: a major environmental and consumer health problem in Europe

*At the present time there is no treatment, other than symptomatic, for fragrance hypersensitivity reactions and the only means available to improve public health in this sector is prevention. The main objective of the project was the prevention of fragrance chemical allergy in non-sensitised (primary prevention) and in already sensitised (secondary prevention) individuals.*



### Objectives

- The aim of the primary prevention part of the study was to create initiatives that regulate the exposure to fragrance chemicals so that induction of allergic contact sensitisation does not take place. This includes the identification and validation of fragrance sensitisers including new emerging ones and insight into their sensitising potential through predictive studies and Quantitative structure-activity relationship (QSAR) analysis;
- The secondary prevention part of the study established measures aimed at avoiding the elicitation of the skin disease in individuals already fragrance-sensitised. It included the standardisation of diagnostic methods to identify the individuals at risk, epidemiological clinical studies combined with exposure assessment, and cross-reactivity studies aiming at allergenic fragrance chemical substitution;

- The results of the different studies were compiled in a risk assessment-management model providing the basis for preventive measures.

### Key findings and conclusions

- Development of a method for the identification of fragrance sensitisers in complex mixtures: the model of oak moss. Atranol and chloroatranol have been identified as major sensitisers in oak moss absolute. A minor sensitiser, methyl- $\beta$ -orcinol carboxylate, has also been identified;
- Allergenicity of fragrance terpenes with respect to their oxidation/degradation over time: the prevalence of sensitisation to certain oxidised compounds has been evaluated in the clinical network and showed that there is a risk of contact allergy in the population caused by the oxidised fragrance chemicals studied. It was also shown that addition of anti-oxidants before air exposure makes

these terpenes stable for some months up to more than a year, depending on the compound;

- Sensitisation potential of selected fragrance chemicals and development of QSAR studies;
- Hand eczema and fragrance allergy: 10% of the patients displayed a positive test to one or more of the allergens in the new series;
- Development of a new fragrance mix: testing within the clinical network confirms that the new FM-II is a valuable tool for identifying subjects with a positive history of adverse reactions to fragrances. 30-50% of these patients would have been missed with the old FM-I;
- The hand immersion technique has been used to assess relations that could exist between hand exposure to fragrance chemicals present in household products and chronic hand eczema. No relation could be evidenced for the 4-(4-hydroxy-4-methylpentyl)-3-cyclohexene carboxaldehyde and hydroxycitronellal models;
- Threshold dose-response studies of newly identified fragrance allergens: three new fragrance allergens giving rise to significant problems in consumers have been identified. Experimental studies in sensitised patients have shown that these allergens currently are used at unacceptable levels in consumer products causing significant disease. This project has provided data on no-effect levels that, if considered in risk assessment, will lead to a safer environment and decreased disease;
- Allergenic fragrance chemical substitution: the case of isoeugenol. Testing within the clinical network with isoeugenol and its derivatives suggested that isoeugenol ether derivatives may be a safer substitute than ester derivatives in isoeugenol allergic subjects. On the other hand, the rate of isoeugenol allergy has not yet shown a consistent decline since the reduction in levels in cosmetic products.

### Relevance and contribution to EU policy

The *Fragrance Allergy* project provided operational scientific data and more effective methods for the diagnosis and risk assessment of fragrance chemical allergy, which are being used for preventive measures.

The project will improve consumer protection as both induction and elicitation of fragrance contact dermatitis are prevented. The principal beneficiaries are eczema patients, diagnostic technologies, companies and European regulation.

The results will be available for the development of alternative methods for predicting the sensitising potential of fragrance chemicals and thus help to improve and reinforce European regulation on the use of fragrance chemicals. The combination of the different studies will provide the EU legislator with scientific background for introducing either mandatory labelling of products, limiting concentration or banning some of the most sensitising fragrance substances. Data obtained on the most common fragrance sensitisers will supplement the EU's Scientific Committee on Cosmetic Products and Non-Food Products (SCCNFP) guidelines on the restrictions to safe levels and labelling of the 26 fragrance allergens list included in the 7<sup>th</sup> Amendment to the European Cosmetics Directive (76/768/EEC).

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#### Project acronym

FRAGRANCE ALLERGY

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#### FP5 Thematic Programme

Quality of Life and Management of Living Resources

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#### EC contribution

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#### Website

<http://www.cordis.lu/life/src/projects.htm>

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