



The Federal Institute for Risk Assessment (BfR) is the national institute which prepares expert reports and opinions on questions of food, feed and chemical safety, as well as consumer health protection, on the basis of internationally recognised scientific assessment criteria. It advises the German government and other institutions and interest groups in these areas. The BfR conducts its own research on topics closely related to its assessment tasks. It is a legally responsible institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL). The BfR has its headquarters in Berlin.

At BfR's Department for Chemicals and Product Safety there is an opening for a

Master/Diploma Thesis

on the topic:

Characterization and quantification of contact allergen-specific T cell populations in human blood

Contact allergies are common T cell-mediated hypersensitivities that manifest as allergic contact dermatitis in the skin. Many hundreds of organic chemicals and some metal ions have been identified as sensitizing agents, triggering an innate inflammatory immune response that results in the priming of contact allergen-specific T cells. The factors that determine the strength of the T cell response and thereby define the potency of a contact sensitizer are largely unknown.

Our lab combines recently developed techniques to track contact allergen-specific T cells based on short-term unbiased expression of CD154 (CD40L) by activated CD4⁺ T helper cells and high-throughput sequencing of the involved T cell receptors. We applied these methods to detect nickel-specific T helper cells in allergic and non-allergic individuals (Aparicio-Soto et al., in review). We now seek to expand our assay to organic contact allergens since the detection of contact allergen-specific T cells in blood could fill an existing gap in the identification of sensitizing chemicals via in vitro tests, and there may be correlations between the frequencies of specific T cells and potencies of some allergens. Also, such assay could lead to the development of new diagnostic approaches.

Duties:

- Evaluate whether allergen-specific T cells can be analyzed and quantified by a CD154-based read-out directly ex vivo after stimulation of peripheral blood mononuclear cell (PBMCs)
- Use of different organic chemicals including methylisothiazolinone (MI), methylchloroisothiazolinone (MCI), 2-mercaptobenzothiazol (MBT), formaldehyde (FA), para-phenylenediamine (PPD) and other chemicals including ingredients from tattoo inks which have been linked to contact allergies
- The laboratory work will include the following methods: PBMC isolation, allergen stimulation, multi-parameter flow cytometry including single cell sorting, in vitro culture and expansion of T cell lines and clones, T cell receptor analysis by high-throughput sequencing, cytokine analysis by bead-based multiplex assays and others

Requirements:

- Highly motivated student with background in biology/immunology/biomedicine or another related field (e.g. biochemistry, toxicology, chemistry, biotechnology, pharmacy)
- Experience with cell culture or some other of the required methods would be appreciated but is not a prerequisite
- Very good written and spoken English language skills
- Flexible, engaged and self-organized way of working

We offer an excellently equipped laboratory environment, a cooperative research environment in an interdisciplinary and international team and comprehensive supervision.

More detailed information is available from Dr. Siewert (Tel. +49 30 18412-27003) and from Dr. Aparicio Soto (Tel. +49 30 18412-27004). If you are interested, please apply via E-Mail to (Katherina.Siewert@bfr.bund.de or Marina.Aparicio-Soto@bfr.bund.de) using the subject „Characterization and quantification of contact allergen-specific T cell populations in human blood “. Please send your application with complete documentation (including a short letter of motivation, CV, certificates and transcripts (Bsc) and contact information of at least one referee).

The BfR welcomes applications from people of all nationalities. The BfR is an innovative scientific institute offering family-friendly working conditions for which it was awarded the “audit berufundfamilie®” (work and family) certificate. The BfR guarantees equal career opportunities for women and men, and is therefore particularly interested in receiving applications from women. In the case of equal suitability, severely disabled applicants will be given preferential consideration and are only required to have a minimum level of physical suitability.

