**In brief - The NFA’s research programme for the Chemical Working Environment**

**Summary**

It has been well-established that exposures to a wide range of substances can have a serious impact on a person’s health. Employees across many industries in Denmark are subjected to chemical and microbiological exposures, and there is a broad consensus that we need more knowledge about these exposures. The ‘National strategy for working environment research’ emphasises that work involving chemistry should be safe and healthy and that fewer people should be exposed to hazardous chemical substances in the workplace. The research programme will contribute to that aim.

**Vision**

The vision for the research programme is to contribute to the identification and characterisation of significant exposures to chemicals, particles and microorganisms in the working environment. Through research, dissemination and training, we must prevent and manage exposures and help create safer working environments for workers who are subjected to chemical and microbiological exposures.

To ensure that the research targets the most serious and/or widespread chemical and microbiological working environment problems, relevant stakeholders will be regularly consulted; during the project idea phase and preparation of applications, once the research project is underway and in connection with the dissemination of research results. The goal is to achieve the greatest possible social impact.

**Focus areas**

The research programme consists of seven prioritised focus areas in which the NFA’s ambition is to be an international leader. The seven focus areas contribute to all the three types of evidence included in the national research strategy. The prioritised focus areas are as follows:

1. about microorganisms and bioaerosols - including workplace surveys, risk assessments and the development and evaluation of preventive measures.
2. knowledge about surveys, characterisation and quantification of chemical exposures in the working environment.
3. knowledge about the link between internal and external exposure to chemicals in exposure surveys.
4. knowledge about Adverse Outcome Pathways for particle-mediated toxicity and establishment of causal relationships in the chemical working environment.
5. knowledge about particle toxicology and risk of cancer, cardiovascular disease and impact on reproduction as well as important impacts on health.
6. knowledge about detailed physical/chemical characterisations of particles, e.g. chemical composition.
7. development of animal-free models for testing acute lung toxicity of particles and chemicals as an important risk-assessment tool

When relevant and possible, the projects will be designed to allow financial evaluation. In addition, projects will - to the relevant extent - incorporate digital risk assessment tools and omics techniques which measure the production of genes, proteins, small metabolites, etc.

**Prioritised initiatives**

The research programme will make use of the collaboration opportunities that our involvement of stakeholders offers with a view to identifying knowledge gaps on serious or prevalent chemical working environment issues. Working together with our extensive network of national and international contacts, we will prioritise collaboration projects on the following areas:

* occupational hygiene: Workplace surveys (exposure and characterisation).
* toxicology: In vivo and in vitro studies of adverse health effects.
* epidemiology and biomonitoring studies (prevention and intervention).
* new methods for characterisation as well as risk assessment and handling of chemical substances, risk management and safety by design.

**Competences**

The Chemical Working Environment research area possesses relevant competences, but is dependent on maintaining and expanding these competences within the prioritised focus areas. Our focus is especially on advanced real-time surveys and characterisation of exposures, collaboration on new analyses (e.g. omics) which can increase knowledge by utilising existing tissues from animal testing and OECD approval of standard methods as well as the further development of risk assessment tools.