

Horizon 2020-SC1-BHC-28-2019 (RIA)



**Project No. 874707**

**Mapping Exposure-Induced Immune Effects: Connecting the Exposome and the Immunome**

## **Report 3**

# **Occupational exposure assessment in disease cohorts**

**Methodology developed and deployed by the EXIMIOUS project**

WP 3 – Exposome identification – Exposure assessment through inhalation and skin

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## Contents

<b>ABBREVIATIONS .....</b>	<b>2</b>
<b>PARTNER SHORT NAMES .....</b>	<b>2</b>
<b>ABSTRACT .....</b>	<b>3</b>
<b>1 INTRODUCTION .....</b>	<b>4</b>
<b>2 BACKGROUND.....</b>	<b>4</b>
<b>3 APPROACH .....</b>	<b>4</b>
3.1 Stepwise approach.....	4
3.2 Practical organisation .....	5

## Abbreviations

<b>EC</b>	European Commission
<b>EU</b>	European Union
<b>H2020</b>	Horizon 2020
<b>SDS</b>	Safety Data Sheet

## Partner Short Names

<b>ACCEL</b>	accelopment AG
<b>AU</b>	Aarhus University, Section of Atmospheric Modelling, Department of Environmental Science
<b>BeCOH</b>	Belgian Center for Occupational Hygiene
<b>BI</b>	The Babraham Institute
<b>Biogenity</b>	Biogenity Aps
<b>IMEC</b>	Interuniversitair Microelectronica Centrum
<b>KU Leuven</b>	Katholieke Universiteit Leuven
<b>NIPH</b>	Norwegian Institute of Public Health, Toxicology and Risk Assessment
<b>NRCWE NFA</b>	National Research Centre for the Working Environment
<b>QUB</b>	The Queen's University of Belfast, School of Pharmacy
<b>REGIONH</b>	Region Hovedstaden
<b>UCL</b>	Universite Catholique de Louvain, Louvain Centre for Toxicology and Applied Pharmacology (LTAP)
<b>UHASSELT</b>	University of Hasselt, Centre for Environmental Sciences
<b>UMFST</b>	University of Medicine, Pharmacy, Science and Technology of Targu Mures
<b>VHIR</b>	Vall d'Hebron Research Institute, Pneumology Department

## Abstract

The EXIMIOUS project has developed and deployed a novel method to assess occupational exposures in a diseased population. The ultimate aim of this method is to determine the exposure profile of patients, thereby promoting a better understanding of the impact of occupational exposure on the development of disease.

This report describes the stepwise approach and how it is practically setup.

## 1 Introduction

The EXIMIOUS project has developed and deployed a novel method to assess occupational exposures in a diseased population. The ultimate aim of this method is to determine the exposure profile of patients, thereby promoting a better understanding of the impact of occupational exposure on the development of disease.

This methodology was developed by several partners of the EXIMIOUS project, a H2020 EU-funded project. Credits for the method go to the Belgian Center of Occupational Hygiene (BeCOH) and Katholieke Universiteit Leuven (KU Leuven), with help from Université catholique de Louvain (UCL) and Vall d'Hebron Institut de Recerca (VHIR).

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## 2 Background

The EXIMIOUS project aims to assess the impact of the exposome, including occupational exposures, on the immunome. For this purpose, several study populations were included. Amongst these are three main disease cohorts:

- a. Disease cohort of systemic scleroderma and sarcoidosis (KU Leuven)
- b. Disease cohort of systemic sclerosis, systemic lupus erythematosus and rheumatoid arthritis (UCL)
- c. Hypersensitivity pneumonitis cohort (VHIR)

Patients were recruited at the hospital. A comprehensive questionnaire was completed to assess exposures. This questionnaire was the basis for an assessment of exposures, however, is insufficiently detailed to determine exposure profiles. With a novel methodology, the project aimed to adequately overcome this difficulty.

## 3 Approach

### 3.1 Stepwise approach

A stepwise approach was developed and deployed in the project.

First, patients completed a common **EXIMIOUS questionnaire** containing questions about current and past jobs, lifestyle, and exposures in the home and in their spare time. This questionnaire is administered with aid from a clinician or recruiter.

Although the questionnaire is quite elaborate, the list of current and past jobs is still insufficient to determine the occupational exposure profile. This is where we enter the second phase of the exposure assessment in disease cohorts: **the occupational exposure interview**. The list of current and past jobs is shared with the exposure experts at BeCOH, who suggest additional questions to fill the gaps in information. These questions are discussed in the 'review team', a team consisting of the recruiters and clinicians from the disease cohorts (KU Leuven, UCL, VHIR) and exposure experts at BeCOH. The review team discusses thoroughly which additional information needs to be obtained.

Recruiters or clinicians contact the patients with these additional questions. The interview phase is completed upon having enough information to determine the **exposure profile**.

### 3.2 Practical organisation

The exposure interview is structured and organized in REDCap, the EXIMIOUS data collection platform. The ‘Exposure assessment interview’-instrument, as shown in *figure 1*, is built up to cover the different phases of exposure assessment in disease cohorts:

1. Overview of all available information on a (current or past) job, in the example called ‘Job 1’. This information is automatically transferred from the common EXIMIOUS questionnaire.
2. Phase 1 of questioning: Other available information after completion of the common questionnaire, completed by the clinician/recruiter.
3. Additional questions from the review team: Suggested questions for the interview, if required to determine the exposure profile.
4. Phase 2 of questioning: Additional information obtained during the exposure interview.
5. Safety Data Sheet (for job 1): Uploaded SDS sheet, if available.
6. Final question whether there is enough information to determine the exposure profile. ‘Yes’ is only checked of once there is a sufficient amount of information.

<b>Job 1:</b>	
Start in _____	
Stop in _____	
Employer: _____	
Services: _____	
Job title: _____	
Tasks: _____	
<b>Phase 1 of questioning:</b> What does the recruiter know more? <small>(Further questioning during the questionnaire administration)</small>	<div><div></div><div></div><div></div></div> <div>Expand</div>
<b>Additional questions from the review team:</b>	<div><div></div><div></div><div></div></div> <div>Expand</div>
<b>Phase 2 of questioning:</b> What did the recruiter learn more? <small>(Further questioning after review)</small>	<div><div></div><div></div><div></div></div> <div>Expand</div>
<b>Safety Data Sheet (upload)</b>	<div><div></div><div></div><div></div></div> <div><a href="#">Upload file</a></div>
<b>Enough information to determine the profile?</b>	<div><div></div><div></div><div></div></div> <div><input type="checkbox"/> Yes</div>

Figure 1: Occupational exposure interview instrument in REDCap