

NanoExplore – A pilot study to demonstrate the feasibility of a harmonized approach and validate a choice of biomarkers for exposure and health effects monitoring of nanomaterials in workplaces and urban areas.

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## Overview

### Identification

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Version 1.0

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### Overview

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#### ABSTRACT

Nanotechnologies is a fast-growing field that employs thousands of workers. However, effects of nanoparticles on human health in occupational setting are not completely understood. The aim of this longitudinal multicenter prospective cohort study is to develop an integrated approach for investigation of human health outcomes related to exposure to nanoparticles. Three groups of nanotechnology workers will be recruited in Switzerland, Spain and Italy. “Exposed” (n=80) and “Internal control” (n=40) groups will be recruited from companies manufacturing nanomaterials. “Exposed” group will include individuals who produce or handle nanomaterials, whereas “Internal control” group will include non-exposed individuals from the same companies, e.g., administrative employees. “Universal control” (n=40) group will include individuals from companies with confirmed absence of exposure to nanomaterials. Biomarkers of exposure and effect will be measured in the participants before and after a 4-day monitoring of external exposure (on Monday morning and on Thursday evening) at recruitment and at the 6/9 months follow-up (four times in total). The biomarkers will be analyzed from exhaled breath condensate, expired air and urine samples. Implementation of an integrated and harmonized biomonitoring protocol in occupational settings should demonstrate the feasibility of similar research project in the future, facilitate further epidemiological studies and health surveillance programs, and inform stakeholders of regulatory aspects targeting occupational exposure to engineered and incidental nanoparticles.

#### KIND OF DATA

1. Epidemiological questionnaire
2. Questionnaire for companies

#### UNITS OF ANALYSIS

Companies and employees

#### KEYWORDS

NanoExplore, nanomaterials, nanoparticles, biomonitoring, biomarkers

### Coverage

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#### GEOGRAPHIC COVERAGE

Switzerland, Italy, Spain

### Producers and Sponsors

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#### PRIMARY INVESTIGATOR(S)

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#### FUNDING

Name	Abbreviation	Role
European Commission LIFE program (Grant LIFE17 ENV/GR/000285)		

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## Sampling

### Sampling Procedure

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The recruitment will be conducted following a two-step procedure. First, eligible companies will be recruited using professional contacts previously established by members of the NanoExplore Consortium and via an announcement posted on the NanoExplore website. Next, an information visit will be organized to the companies that gave their agreement to participate in the study. During this visit, a member of the NanoExplore Consortium will explain study objectives, procedure and potential risks and benefits related to participation in the study. Workers willing to participate will be provided with detailed information about data collection procedures. Moreover, during the information visit, a company questionnaire will be administrated to managers or health & safety specialists in order to collect standardized information on company activities, processes at risk for ENMs exposure, equipment and infrastructure already available for protection of their employees. The questionnaires can be filled in online using the REDCap electronic data capture tool.

## Questionnaires

### Overview

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Online questionnaires created and distributed via REDCap electronic data capture tool.

## Data Collection

### Data Collection Dates

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<b>Start</b>	<b>End</b>	<b>Cycle</b>
2020-01-01	2022-06-01	N/A

### Data Collection Mode

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### Data Collection Notes

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### Questionnaires

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Online questionnaires created and distributed via REDCap electronic data capture tool.

## Data Processing

No content available

## Data Appraisal

No content available