

PROJECT

## TUBE

### Transport derived Ultrafines and the Brain Effects

**Funding:** European (Horizon 2020)

**Duration:** May 2019 - Apr 2023

**Status:** Ongoing

**Total project cost:** €5,989,370

**EU contribution:** €5,049,876



[CORDIS RCN : 223132](#)

#### Objectives:

The aim of the research is to study the effects of smallest traffic related ultrafine- or nanoparticles beyond the lung on brain health. Air pollutants have been shown to cause a vast amount of different adverse health effects. These effects include impairment of many respiratory (e.g. asthma, COPD) and cardiovascular (ischemic heart disease, infarction, stroke) diseases. However, in recent years, the evidence showing effects beyond the lungs and circulatory system are becoming more evident.

Neurological diseases, namely Alzheimer's disease (AD) has shown to be associated with living near traffic. However, reason for this has remained unresolved until today. This consortium aims on revealing the mechanisms and exposures both behind cardiorespiratory diseases and beyond the current knowledge in neurological diseases. This consortium includes experts in areas of aerosol technology, emission research, engine and fuel research, human clinical studies, epidemiology, emission inventories, inhalation toxicology, neurotoxicology and disease mechanism studies. This enables research of resolving the effects of nanoparticles from different traffic modes for both air quality and concomitant toxic effect of these air pollutants.

In this study, we will investigate adverse effects of air pollutants using cell cultures, animal exposures and volunteered human exposures as well as the material from epidemiological cohort study. These are going to be compared according to inflammatory, cytotoxic and genotoxic changes and furthermore beyond the current state of the art to neurotoxic and brain health effects.

With this approach, we are aiming in to a comprehensive understanding of the adverse effects of nanoparticles from traffic. In current situations, only particles above 23nm are measured in regulations, traditional toxicological methods are used in risk assessment and emission inventories and regulations are largely based on old technology engines. Our project will change this.

#### Parent Programmes:

[H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport](#)

**Institute type:** Public institution

**Institute name:** European Commission

**Funding type:** Public (EU)

**Other programmes:** LC-MG-1-1-2018 InCo flagship on reduction of transport impact on air quality

#### Lead Organisation:

**Ita-Suomen Yliopisto**

**Address:**

Yliopistonranta 1 E  
70211 Kuopio  
Finland

**EU Contribution:** €891,170

## Partner Organisations:

### Mimetas Bv

**Address:**

JH Oortweg 19  
2333CH Leiden  
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**Organisation Website:**

<http://www.mimetas.com>

**EU Contribution:** €400,393

### Teknologian Tutkimuskeskus Vtt

**Address:**

TEKNIKANTIE 21  
02150 ESPOO  
Finland

**Organisation Website:**

<http://www.vtt.fi>

**EU Contribution:** €520,086

### Kobenhavns Universitet

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Norregade 10  
1165 København  
Denmark

**Organisation Website:**

<http://www.ku.dk>

**EU Contribution:** €294,467

### Ustav Experimentalni Mediciny Akademie Ved Ceske Republiky Verejna Vyzkumna Institute

**Address:**

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**Organisation Website:**

<http://www.iem.cas.cz>

**EU Contribution:** €337,772

### Biotalentum Tudasfejlesztő Kft

**Address:**

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GOEDOELLO  
2100  
Hungary

**Organisation Website:**

<http://www.biotalentum.hu>

**EU Contribution:** €361,875

### Institut Fur Umweltmedizinische Forschung An Der Heinrich-Heine-Universitat Dusseldorf

**Gmbh****Address:**

AUF M HENNEKAMP 50  
40225 DUESSELDORF  
Germany

**Organisation Website:**

<http://www.iuf.uni-duesseldorf.de>

**EU Contribution:** €403,040

**Sun Yat-Sen University****Address:**

West Xin Gang Road, 135  
GUANGZHOU  
510275  
China

**Organisation Website:**

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**EU Contribution:** €0

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33100 TAMPERE  
Finland

**EU Contribution:** €337,087

**Vsparticle Bv****Address:**

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**EU Contribution:** €110,887

**University Of Southampton****Address:**

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<http://www.soton.ac.uk>

**EU Contribution:** €232,868

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<http://www.fmi.fi>

**EU Contribution:** €220,000

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**Organisation Website:**

<http://www.vet.uu.nl>

**EU Contribution:** €578,856

**Centro Premio Nobel Mario Molina Para Estudios Estrategicos Sobre Energia Y Medio Ambiente Chile Limitada**

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Chile

**EU Contribution:** €98,750

**Technologies:**

Unclassified  
Non-technology

**STRIA Roadmaps:** Other specified

**Transport mode:** Multimodal transport

**Transport sectors:** Passenger transport  
Societal/Economic issues, Environmental/Emissions

**Transport policies:** aspects

**Geo-spatial type:** Other