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Biological Foundation for the Safety Classification of Engineered Nanomaterials (ENM): Systems Biology Approaches to Understand Interactions of ENM with Living Organisms and the Environment

Fact Sheet

Project Information

NANOSOLUTIONS

Grant agreement ID: 309329

[Project website](#) 

Project closed

Start date

1 April 2013

End date

31 March 2017

Funded under

Specific Programme "Cooperation": Nanosciences, Nanotechnologies, Materials and new Production Technologies

Total cost

€ 13 765 733,83

EU contribution

€ 10 000 000,00

Coordinated by

TYOTERVEYSLAITOS



Finland

Objective

The main objective of this research proposal is to identify and elaborate those

characteristics of ENM that determine their biological hazard potential. This potential includes the ability of ENM to induce damage at the cellular, tissue, or organism levels by interacting with cellular structures leading to impairment of key cellular functions. These adverse effects may be mediated by ENM-induced alterations in gene expression and translation, but may involve also epigenetic transformation of genetic functions. We believe that it will be possible to create a set of biomarkers of ENM toxicity that are relevant in assessing and predicting the safety and toxicity of ENM across species. The ENM-organism interaction is complex and depends, not simply on the composition of ENM core, but particularly on its physico-chemical properties. In fact, important physico-chemical properties are largely governed by their surface properties. All of these factors determine the binding of different biomolecules on the surface of the ENM, the formation of a corona around the ENM core. Thus, any positive or negative biological effect of ENM in organisms may be dynamically modulated by the bio-molecule corona associated with or substituted into the ENM surface rather than the ENM on its own. The bio-molecule corona of seemingly identical ENM cores may undergo dynamic changes during their passage through different biological compartments; in other words, their biological effects are governed by this complex surface chemistry. We propose that understanding the fundamental characteristics of ENM underpinning their biological effects will provide a sound foundation with which to classify ENM according to their safety. Therefore, the overarching objective of this research is to provide a means to develop a safety classification of ENM based on an understanding of their interactions with living organisms at the molecular, cellular, and organism levels based on their material characteristics.

Fields of science (EuroSciVoc)

[natural sciences](#) > [biological sciences](#) > [biochemistry](#) > [biomolecules](#)

[engineering and technology](#) > [nanotechnology](#) > [nano-materials](#)



Programme(s)

[FP7-NMP - Specific Programme "Cooperation": Nanosciences, Nanotechnologies, Materials and new Production Technologies](#)

Topic(s)

[NMP.2012.1.3-1 - Systematic investigations of the mechanisms and effects of engineered nanomaterial interactions with living systems and/or the environment](#)

Call for proposal

FP7-NMP-2012-LARGE-6

[See other projects for this call](#)

Funding Scheme

[CP-IP - Large-scale integrating project](#)

Coordinator



TYÖTERVEYSLAITOS

EU contribution

€ 1 766 304,79

Total cost

No data

Address

TOPELIUKSENKATU 41 B

00250 Helsinki

 Finland 

Region

Manner-Suomi > Helsinki-Uusimaa > Helsinki-Uusimaa

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Participants (38)



UNIVERSITE BORDEAUX I 

 France

EU contribution

No data

Address

351 Cours de la Liberation
33405 TALENCE 

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 
[Participation in EU R&I programmes](#) 
[HORIZON collaboration network](#) 

Total cost

No data



KAROLINSKA INSTITUTET

 Sweden

EU contribution

€ 1 394 999,60

Address

Nobels Vag 5
17177 Stockholm 

Region

Östra Sverige > Stockholm > Stockholms län

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 
[Participation in EU R&I programmes](#) 
[HORIZON collaboration network](#) 

Total cost

No data



UNIVERSITY COLLEGE DUBLIN, NATIONAL UNIVERSITY OF IRELAND, DUBLIN

 Ireland

EU contribution

€ 580 051,00

Address

BELFIELD

4 Dublin 

Region

Ireland > Eastern and Midland > Dublin

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



**NEDERLANDSE ORGANISATIE VOOR TOEGEPAST
NATUURWETENSCHAPPELIJK ONDERZOEK TNO**

 Netherlands

EU contribution

€ 244 894,75

Address

ANNA VAN BUERENPLEIN 1

2595 DA Den Haag 

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



UNIVERSITE DE BORDEAUX

 France

EU contribution

€ 250 000,40

Address

PLACE PEY BERLAND 35
33000 Bordeaux 

Region

Nouvelle-Aquitaine > Aquitaine > Gironde

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 
[Participation in EU R&I programmes](#) 
[HORIZON collaboration network](#) 

Total cost

No data



UNIVERSITY COLLEGE LONDON 

EU contribution

€ 5 433,88

Address

GOWER STREET
WC1E 6BT LONDON 

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 
[Participation in EU R&I programmes](#) 
[HORIZON collaboration network](#) 

Total cost

No data



UNIVERSITY OF PLYMOUTH

 United Kingdom

EU contribution

€ 414 064,80

Address

DRAKE CIRCUS
PL4 8AA Plymouth 

Region

South West (England) > Devon > Plymouth

Activity type

Higher or Secondary Education Establishments

Links

- [Contact the organisation](#) 
- [Website](#) 
- [Participation in EU R&I programmes](#) 
- [HORIZON collaboration network](#) 

Total cost

No data



HERIOT-WATT UNIVERSITY

 United Kingdom

EU contribution

€ 299 999,60

Address

RICCARTON
EH14 4AS Edinburgh 

Region

Scotland > Eastern Scotland > Edinburgh

Activity type

Higher or Secondary Education Establishments

Links

- [Contact the organisation](#) 
- [Website](#) 
- [Participation in EU R&I programmes](#) 
- [HORIZON collaboration network](#) 

Total cost

No data



ASOCIACION CENTRO DE INVESTIGACION COOPERATIVA EN BIOMATERIALES- CIC biomaGUNE

 Spain

EU contribution

€ 365 000,00

Address

PASEO MIRAMON 182, PARQUE TECNOLOGICO DE SAN SEBASTIAN EDIFICIO EMPRESARIAL C
20009 San Sebastian 

Region

Noreste > País Vasco > Gipuzkoa

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



LUDWIG-MAXIMILIANS-UNIVERSITAET MUENCHEN

 Germany

EU contribution

€ 464 100,00

Address

GESCHWISTER SCHOLL PLATZ 1
80539 MUNCHEN 

Region

Bayern > Oberbayern > München, Kreisfreie Stadt

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



INSTITUTE OF OCCUPATIONAL MEDICINE

United Kingdom

EU contribution

€ 339 686,29

Address

RESEARCH PARK NORTH RICcarton
EH14 4AP EDINBURGH

Region

Scotland > Eastern Scotland > Edinburgh

Activity type

Research Organisations

Links

- [Contact the organisation](#)
- [Website](#)
- [Participation in EU R&I programmes](#)
- [HORIZON collaboration network](#)

Total cost

No data



TURUN YLIOPISTO

Finland

EU contribution

€ 249 999,00

Address

YLIOPISTONMAKI
20014 Turku

Region

Manner-Suomi > Etelä-Suomi > Varsinais-Suomi

Activity type

Higher or Secondary Education Establishments

Links

- [Contact the organisation](#)
- [Website](#)
- [Participation in EU R&I programmes](#)

Total cost

No data



TEKNOLOGIAN TUTKIMUSKESKUS VTT 

 Finland

EU contribution

€ 50 986,14

Address

TEKNIIKANTIE 4 A
02044 VTT ESPOO 

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



ACONDICIONAMIENTO TARRASENSE ASSOCIACION

 Spain

EU contribution

€ 274 152,00

Address

CARRER DE LA INNOVACIO 2
08225 Terrassa 

Region

Este > Cataluña > Barcelona

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

Total cost

No data



DANMARKS TEKNISKE UNIVERSITET

 Denmark

EU contribution

€ 289 999,75

Address

ANKER ENGELUNDS VEJ 101
2800 Kongens Lyngby 

Region

Danmark > Hovedstaden > Københavns omegn

Activity type

Higher or Secondary Education Establishments

Links

- [Contact the organisation](#)  [Website](#) 
- [Participation in EU R&I programmes](#) 
- [HORIZON collaboration network](#) 

Total cost

No data



FONDAZIONE TELETHON ETS

 Italy

EU contribution

€ 249 996,80

Address

VIA VARESE 16/B
00185 Roma 

Region

Centro (IT) > Lazio > Roma

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



UNIVERSITAET LEIPZIG

 Germany

EU contribution

€ 250 000,40

Address

RITTERSTRASSE 26
04109 Leipzig 

Region

Sachsen > Leipzig > Leipzig

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



EIDGENOSSISCHE MATERIALPRUFUNGS- UND FORSCHUNGSANSTALT

 Switzerland

EU contribution

€ 290 000,00

Address

UEBERLANDSTRASSE 129
8600 Dubendorf 

Region

Schweiz/Suisse/Svizzera > Zürich > Zürich

Activity type

Higher or Secondary Education Establishments

Links

- [Contact the organisation](#)
- [Website](#)
- [Participation in EU R&I programmes](#)
- [HORIZON collaboration network](#)

Total cost

No data



BIOBYTE SOLUTIONS GMBH

Germany

EU contribution

€ 150 000,00

Address

Bothestrasse 142
69126 Heidelberg

Region

Baden-Württemberg > Karlsruhe > Heidelberg, Stadtkreis

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- [Contact the organisation](#)
- [Website](#)
- [Participation in EU R&I programmes](#)
- [HORIZON collaboration network](#)

Total cost

No data



INSIGHT PUBLISHERS LIMITED

United Kingdom

EU contribution

€ 399 240,00

Address

KING SQUARE 12-13
BS2 8JH Bristol

Region

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) [Website](#)

[Participation in EU R&I programmes](#)

[HORIZON collaboration network](#)

Total cost

No data



PLASMACHEM PRODUKTIONS- UND HANDEL GMBH

Germany

EU contribution

€ 149 996,00

Address

SCHWARZSCHILDSTRASSE 10
12489 Berlin

Region

Berlin > Berlin > Berlin

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) [Website](#)

[Participation in EU R&I programmes](#)

[HORIZON collaboration network](#)

Total cost

No data



INKOA SISTEMAS SL

Spain

EU contribution

€ 126 240,00

Address

AV RIBERA DE AXPE 11 EDIFICIO D 1 OFICINA 208
48950 Erandio 

Region

Noreste > País Vasco > Bizkaia

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- [Contact the organisation](#) 
- [Website](#) 
- [Participation in EU R&I programmes](#) 
- [HORIZON collaboration network](#) 

Total cost

No data



BIOTESYS GMBH

 Germany

EU contribution

€ 150 000,00

Address

SCHELZTORSTRASSE 54-56
73728 ESSLINGEN 

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- [Contact the organisation](#) 
- [Participation in EU R&I programmes](#) 
- [HORIZON collaboration network](#) 

Total cost

No data



Zhejiang University

 China

EU contribution

€ 100 000,00

Address

ZHE DA ROAD 38
310027 HANGZHOU 

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



FUNDACAO UNIVERSIDADE DE BRASILIA

 Brazil

EU contribution

€ 100 000,00

Address

**CAMPUS UNIVERSITARIO DARCY RIBEIRO FACULDADE DE TECNOLOGIE AT 05 BAIRRO
ASA NORTE**

70919 970 Brasilia Df 

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



NATIONAL HEALTH LABORATORY SERVICES

 South Africa

EU contribution

€ 80 000,00

Address

**MODDERFONTEIN ROAD 1 GAUTENG
2131 Sandringham** 

Activity type
Higher or Secondary Education Establishments

Links
[Contact the organisation](#)
[Participation in EU R&I programmes](#)
[HORIZON collaboration network](#)

Total cost
No data



NOORDWES-UNIVERSITEIT

South Africa

EU contribution
€ 80 000,00

Address
HOFFMAN STREET 11
2531 Potchefstroom

Activity type
Higher or Secondary Education Establishments

Links
[Contact the organisation](#) [Website](#)
[Participation in EU R&I programmes](#)
[HORIZON collaboration network](#)

Total cost
No data



NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

United States

EU contribution
No data

Address
WILLOWDALE ROAD MS L 2015
26505 MORGANTOWN

Activity type
Research Organisations

Links

- [Contact the organisation](#)
- [Website](#)
- [Participation in EU R&I programmes](#)
- [HORIZON collaboration network](#)

Total cost

No data



LEIDOS BIOMEDICAL RESEARCH INC

United States

EU contribution

No data

Address

BOYLES STREET 1050
21702 FREDERICK MD

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- [Contact the organisation](#)
- [Website](#)
- [Participation in EU R&I programmes](#)
- [HORIZON collaboration network](#)

Total cost

No data



NANOCYL SA

Belgium

EU contribution

€ 19 040,00

Address

RUE DE L'ESSOR 4
5060 Sambreville

Region

Région wallonne > Prov. Namur > Arr. Namur

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- [Contact the organisation](#)
- [Website](#)
- [Participation in EU R&I programmes](#)
- [HORIZON collaboration network](#)

Total cost

No data



NANOLOGICA AB

Sweden

EU contribution

€ 20 000,40

Address

DROTTNING KRISTINAS VAG 45
114 28 Stockholm

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- [Contact the organisation](#)
- [Website](#)
- [Participation in EU R&I programmes](#)
- [HORIZON collaboration network](#)

Total cost

No data



UNIVERSITA DEGLI STUDI DI SALERNO

Italy

EU contribution

€ 50 000,00

Address

VIA GIOVANNI PAOLO II 132
84084 Fisciano Sa

Region

Sud > Campania > Salerno

Activity type

Higher or Secondary Education Establishments

Links

- [Contact the organisation](#)
- [Website](#)
- [Participation in EU R&I programmes](#)
- [HORIZON collaboration network](#)

Total cost

No data



SOLVAY SA

Belgium

EU contribution

€ 13 733,50

Address

RUE DE RANSBEEK 310
1120 Bruxelles / Brussel

Region

Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest > Région de Bruxelles-Capitale/ Brussels Hoofdstedelijk Gewest > Arr. de Bruxelles-Capitale/Arr. Brussel-Hoofdstad

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- [Contact the organisation](#)
- [Website](#)
- [Participation in EU R&I programmes](#)
- [HORIZON collaboration network](#)

Total cost

No data



POLYMER FACTORY SWEDEN AB

Sweden

EU contribution

€ 19 785,00

Address

TEKNIKRINGEN 48 1 TR
114 28 STOCKHOLM

Region

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) [Website](#)

[Participation in EU R&I programmes](#)

[HORIZON collaboration network](#)

Total cost

No data



POLIMEROS Y SISTEMAS DE APLICACION TECNICA SL

Spain

EU contribution

€ 19 880,00

Address

CALLE CAPCIR 12, POL IND PLACA DE LA BRUGUERA
08211 CASTELLAR DEL VALLES

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) [Website](#)

[Participation in EU R&I programmes](#)

[HORIZON collaboration network](#)

Total cost

No data



THE UNIVERSITY OF MANCHESTER

United Kingdom

EU contribution

€ 244 566,12

Address

OXFORD ROAD
M13 9PL Manchester

Region

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#) [Website](#)

[Participation in EU R&I programmes](#)

[HORIZON collaboration network](#)

Total cost

No data



MISVIK BIOLOGY OY

+ Finland

EU contribution

€ 350 562,98

Address

KARJAKATU 35 B

20520 Turku

Region

Manner-Suomi > Etelä-Suomi > Varsinais-Suomi

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) [Website](#)

[Participation in EU R&I programmes](#)

[HORIZON collaboration network](#)

Total cost

No data



HELSINGIN YLIOPISTO

+ Finland

EU contribution

€ 147 286,80

Address

FABIANINKATU 33
00014 HELSINGIN YLIOPISTO 

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data

Last update: 25 July 2016

Permalink: <https://cordis.europa.eu/project/id/309329>

European Union, 2025