

Horizon 2020 - H2020-MSCA-ITN-2017



Project: 766251– NEUROSOME

Full project title:

EXPLORING THE NEUROLOGICAL EXPOSOME

D8.3 Training material on S/T and soft skills

WP8: Structured training courses

Lead beneficiary: AUTH

Date: December 2018

Nature: OTHER

Dissemination level: Public



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 766251



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1 Introduction

NEUROSOME provides training to ESRs that is a combination of a) supervision from host and secondment institutions, b) training events that include participation to research conferences and workshops, and c) courses provided by host and secondment institutions.

Supervision from host and secondment institutions is crucial in NEUROSOME and provides a comprehensive guidance to the participating ERSs enabling them to prepare high-quality researchers in the field of environment and health. Research conferences and workshops are major events which serve as platforms to exchange knowledge and current research progress, and crucially provide a forum for ESRs to discuss research ideas and direction. Courses provided by the NEUROSOME network offer not only up-to-date scientific knowledge, but also allow to develop transferable skills such as management of research groups, ethical aspects of conducting research in human, commercial exploitation of the project outcomes, intellectual property rights, and others.

The purpose of this deliverable is to briefly describe the training organization process and to provide an overview of the training material developed to be used especially in training events related to international research conferences and workshops and/or courses provided by host institutions.

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2 Training organization process

Before the trainers starts to organise the training, NEUROSOME partners prepared a plan to ensure the achievement of expected results. This helped to multiply the effort devoted to the whole process of training and to achieve the desired outcomes and satisfaction of the trainees. The key element was to prepare the training in an interactive fashion which will enrich both the trainer and the trainees in terms of mutual transfer of knowledge.

To efficiently organize training the following questions have been considered:

- What is the number of participants?
- What are the needs of the trainees and their expectations regarding the topic of the training?
- What are the aims of the training?
- What is the proper method of training?
- What is the optimal time that should be devoted to one training session?

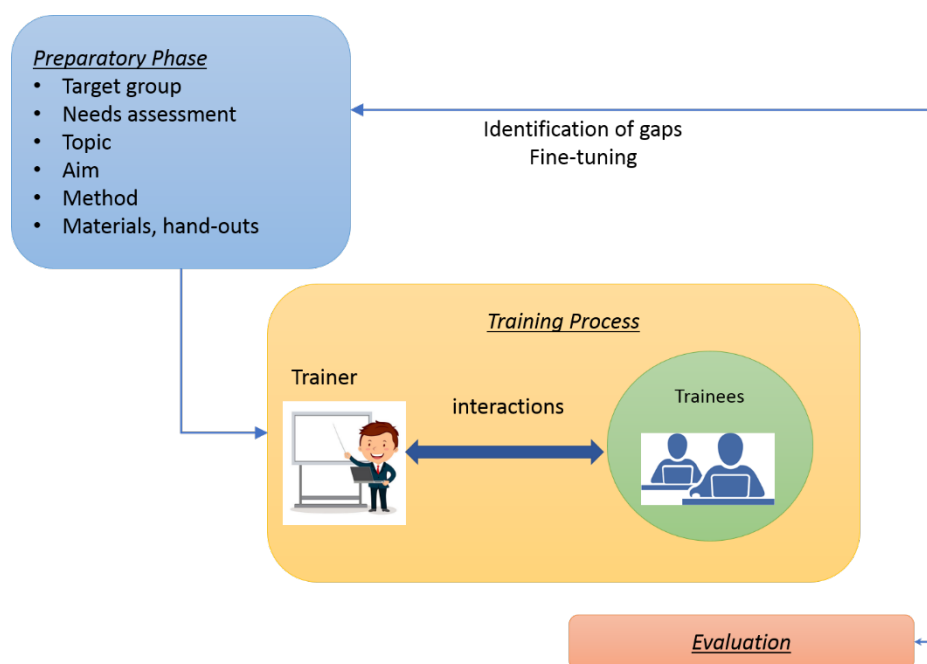



Figure 1: Illustration of training process

After assessing the needs of the target group, the trainer can start to think about the aims and objectives s/he wants to accomplish by the training since the training programme is based on their achievement. The aims and objectives are an important part of the training because they determine what steps will follow regarding the design of the training.

Next step was to focus on how aims and objective identified can be accomplished. To this aim the trainers need to consider the different training methods and techniques that are widely used. The fundamental criterion in selecting a particular method should be its appropriateness to the aims and objectives.

Using proper approach is a prerequisite condition for the effectiveness of conducting a training

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programme. The selection and use of appropriate methods and techniques becomes all the more crucial as the participatory nature of the activity demands that the training should be not only educative, but equally stimulating. Use of a single most effective approach or combination of approaches promotes greater interaction between the trainer and the trainee and, hence, creates a productive learning experience.

No matter what is the method used for the training. However, one of the basic principles is to make the participants to become actively involved. This on one hand helps to develop the skills of trainees and, on the other hand to receive immediate feedback which can be transformed into new knowledge and ideas. This mutual interaction (Fig. 1) not only improves the training process but also creates the space for new incentives and interfaces. Additionally, it is good to create interactions also among participants. This results in further exchange of knowledge and experience of all involved. Professional trainer with subject matter expertise should achieve that successful trainees will multiply the gained knowledge and pass it on to the others.

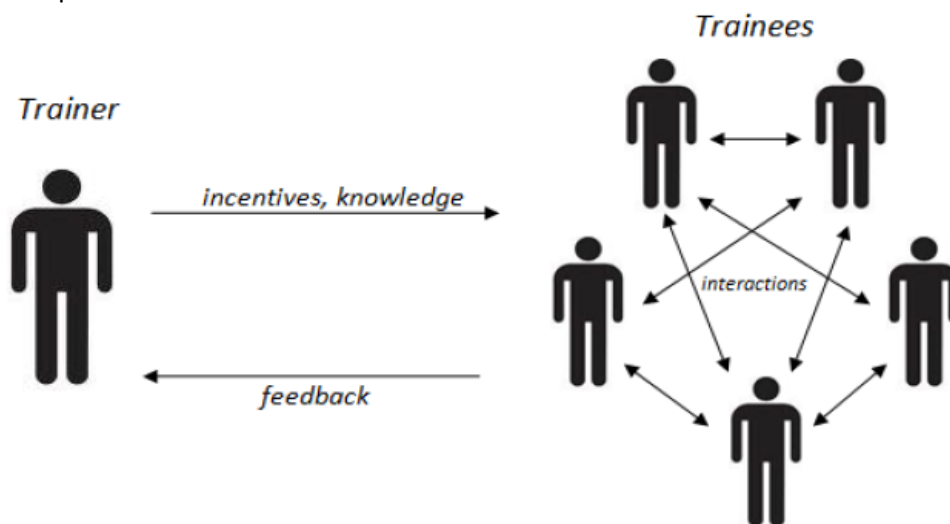


Figure 2: Interactive model of training


The training methods and techniques selected are as follows:

Lecturing:

This method is based on the presentation/speech given by the trainer. Therefore, it is based on the trainers' existing base of knowledge. It is one of the most popular methods used in the training programme. Even despite its biggest disadvantage, which is usually passive listening of trainees, the trainer can upgrade this method by active involvement of trainees. This participative technique can maximise understanding and retention. Different lecture techniques can increase participation and engagement and thus, improve the effectiveness of the lecture.

Pro:

- Cost efficient method
- Allows transfer of information to a large target group

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- Can present large amounts of information

Cons:

- Trainees are usually only passive receivers of information
- It does not ensure automatic learning
- Good time management is necessary, long monologues discourage the trainees

Discussion / Brainstorming:

It is the easiest way to involve the trainees in the training process using their critical thinking and interpersonal exchange of information and ideas. This method allows that everyone can actively participate in the training and express his/her ideas and experience. The best results can be achieved when the discussion is conducted in a guided manner.

Pro:

- Effective, challenging
- Trainees are usually quite active receivers of information
- Bringing unexpected situations requiring flexible reactions of trainees

Cons:

- It is hard to achieve equal participation of all involved
- Not practical for large number of participants
- Easy to get off-topic

Workshop:


It is one of the most effective training methods involving 10 to 25 participants who are trying to find a solution to a common problem and who are discussing actively in order to solve an issue.

Pro:

- Concentration to reach consensus on common topic
- Use of creative thinking
- Good opportunity for networking

Cons:

- Requires more time and organisational resources
- It may be hard to fit everything that you want to cover into a single workshop

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3 NEUROSOME first training school

The first NEUROSOME training school has been co-organised by Prof. Dimosthenis Sarigiannis and Prof. Aris Tsatsakis in the frame of the BIONANOTOX conference that has been held in Heraklion, Crete (GREECE) on May 5-12, 2019.

The training school consisted of a one-week course that included the following topics:


- Exposome science in the advent of omics – the connectivity approach
- Sampling and analysis of environmental and biological matrices
- Advanced exposure science
- Environmental and integrated exposure modelling
- Computational methods in toxicology



Figure 3: participants of the first NEUROSOME training school




Figure 4: NEUROSOME ESRs at the first training school

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3.1 NEUROSOME training agenda

SCIENTIFIC PROGRAM	
Thursday, May 09, 2019	
17:00-17:30	MODIFIED COPOLYMERS OF MALEIN ANHYDRIDE WITH DIFFERENT FUNCTIONAL ACTIVITY G.I. Boyko¹, N.P. Lyubchenko¹, R.G. Sarmurzina², U.S. Karabalin², D.S. Tiesov³, R.F. Mukhamedova¹, S.A. Taukeleva⁴ ¹ Kazakh National Research Technical University named after K. Satpayev, Almaty, Kazakhstan ² Association «Kazenergy», Astana, Kazakhstan ³ AO «Kazakhstan Petrochemical Industries», Astana, Kazakhstan ⁴ Almaty State Institute of Advanced Medical Studies, Almaty, Kazakhstan
17:30-18:00	AMPHIPHILIC OLIGOMERS OF ACRYLIC ACID AS CARRIERS OF WATER-INSOLUBLE BIOLOGICALLY ACTIVE SUBSTANCES Ya.O. Mezhuiev¹, V.T. Dzhezheya¹, O.Yu. Sizova¹, A.L. Luss¹, M.I. Shtilman¹, A.M. Tsatsakis² ¹ D. Mendeleev University of Chemical Technology of Russia, Moscow, Russian Federation ² University of Crete, Heraklion, Greece
18:00-18:30	SCREENING OF BIOPOLYMERIC MATERIALS FOR CARDIOVASCULAR SURGERY TOXICITY—EVALUATION OF THEIR SURFACE RELIEF WITH ASSESSMENT OF MORPHOLOGICAL ASPECTS OF MONOCYTE/MACROPHAGE POLARIZATION IN ATHEROSCLEROSIS PATIENTS E.I. Shishatskaya¹, N.G. Menzhanova¹, D.P. Stolyarov², D.B. Dryganov² ¹ Siberian Federal University, 79 Svobodnyi Av., Krasnoyarsk 660041, Russia ² Federal Center for Cardiovascular Surgery, 45 Karaulnaya, Krasnoyarsk, 660020, Russia
16:30-17:10	NEUROSOME ROUND TABLE DISCUSSION HALL 2 Prof A. Tsatsakis, Prof D.A. Sarigiannis, Prof S. Karakitsios, Prof X. Coumoul, Prof I. Petridis, Prof J. O. Grimalt, Prof B. Tine
17:10-18:40	SHORT ORAL PRESENTATIONS Chairmen: Prof A. Tsatsakis, Prof D.A. Sarigiannis
17:10-17:20	TOXICITY OF GOLD NANOPARTICLES IN 4T1 AND A2780 PGL451 CELL LINES K. Sikorska¹, S. Męczyńska-Wielgosz¹, M. Wojewódzka¹, L. Kapka-Skrzypczak^{2,3}, M. Kruszewski^{1,2,3} ¹ Institute of Nuclear Chemistry and Technology, Centre for Radiobiology and Biological Dosimetry, Dorodna 16, 03-195 Warsaw, Poland ² Institute of Rural Health, Department of Molecular Biology and Translational Research, Jaczewskiego 2, 20-090 Lublin, Poland ³ University of Information Technology and Management, Department of Medical Biology and Translational Research, Suchbatskiego 2, 35-225 Rzeszów, Poland
17:20-17:30	ADVANCED ROUTINES IN THE ESTIMATION OF TELOMERE LENGTH USING BIOTEL I. Tsatsakis¹, P. Fragkiadaki¹, A. Alegakis¹, E. Vakonaki¹, M. Tzatzarakis¹, V. Karzi¹, E. Renieri¹, E. Sarandi², D. Tsoukalas², A. Tsatsakis¹ ¹ Laboratory of Toxicology and Forensic Sciences, Medical School, University of Crete, Heraklion, Greece ² Metabolomic Medicine, Health Clinics for Autoimmune and Chronic Diseases, Athens, Greece.
17:30-17:40	IN VITRO ENDOTHELIUM COMPATIBILITY OF AMPHIPHILIC POLY-N-VINYLPYRROLIDONE NANOPARTICLES G. Fanouraki, A. Berdiaki, E. Perisynaki, A. Stratidakis, A. Kuskov, A. Tsatsakis, G. Tzanakakis, D. Nikitovic Medical School, University of Crete
<div> <div>BIONANOTOX 2019</div> <div>11</div> </div>	

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17:40-17:50	RISK ASSESSMENT OF EDCS IN EUROPE BASED ON HUMAN BIOMONITORING DATA S. Karakitsios^{1,2}, R. Razaee^{1,2}, D. Sarigiannis^{1,2,3} ¹ HERACLES Research Center on the Exposome and Health, Center for Interdisciplinary Research and Innovation, Aristotle University of Thessaloniki, Greece ² Aristotle University of Thessaloniki, Department of Chemical Engineering, Environmental Engineering Laboratory, Thessaloniki, Greece ³ School for Advanced Study (IUSS), Science, Technology and Society Department, Pavia, Italy
17:50-18:00	EXPOSURE TO ENDOCRINE DISRUPTORS: URINARY PHTHALATE METABOLITE CONCENTRATIONS IN THE SLOVENIAN GENERAL POPULATION A. Runkel^{1,2}, J. Snoj Tratnik^{1,2}, D. Mazej¹, M. Horvat^{1,2} ¹ Jozef Stefan Institute, Jamova cesta 39, 1000 Ljubljana, Slovenia ² Jozef Stefan International Postgraduate School, Jamova cesta 39, 1000 Ljubljana, Slovenia
18:00-18:10	REAL LIFE RISK SIMULATION OF EXPOSURE TO ENDOCRINE DISRUPTORS V. Karzi¹, M. Tzatzarakis¹, E. Vakonaki¹, P. Stivaktakis¹, A. Kalliantasi¹, E. Apalaki¹, C. Chalkiadaki¹, M. Panagiotopoulou¹, I. Fragkiadoulaki¹, A. Tsatsakis¹ ¹ Laboratory of Toxicology and Forensic Sciences, Medical School, University of Crete, Heraklion, Greece
18:10-18:20	IMMUNODIAGNOSTIC DETERMINATION OF GLYPHOSATE IN WINE AND WATER SAMPLES V. Karzi¹, S. Daskalaki^{1,2}, M. Tzatzarakis¹, E. Iatrou¹, E. Vakonaki¹, S. Papachristou¹, E. Iliaki¹, A. K. Rizos², A. Tsatsakis¹ ¹ Laboratory of Toxicology and Forensic Sciences, Medical School, University of Crete, Heraklion, Greece ² Department of Chemistry, University of Crete and Foundation for Research and Technology - Hellas (FORTH-IESL), Heraklion, Greece
18:20-18:30	QUALITY ASSESSMENT OF OMEGA-3 DIETARY SUPPLEMENTS IN THE GREEK MARKET N. Saliagi^{1,2}, M. Tzatzarakis², V. Karzi¹, E. Vakonaki¹, C. Giannakoudakis¹, A. K. Rizos¹, A. Tsatsakis² ¹ Department of Chemistry, University of Crete and Foundation for Research and Technology - Hellas (FORTH-IESL), Heraklion, Greece ² Laboratory of Toxicology and Forensic Sciences, Medical School, University of Crete, Heraklion, Greece
18:30-18:40	DEVELOPMENTAL EXPOSURE TO HEAVY METAL MIXTURE: NEUROBEHAVIORAL ANALYSIS IN AN IN VIVO MODEL Ö.Dinçkol, L.Ricceri, G.Calamandrei Center for Behavioral Sciences and Mental Health, Istituto Superiore di Sanità, Rome, Italy

Friday, May 10, 2019


08:00-09:30	BREAKFAST
16:30-18:00	MORNING SESSION NEUROSOME Chairmen: Prof D. Sarigiannis, Prof S. Karakitsios
10:00-10:30	NEUROTOXICITY TESTING FOR PESTICIDES MIXTURES: RESEARCH APPLICATIONS AND REGULATIONS UNDER RLRS CONCEPT M. Goumenou Department of Toxicology and Forensic Sciences of the Medical School at the University of Crete, Heraklion, Crete, Greece

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Friday, May 10, 2019

10.30-11.00	EXPOSURE MODELLING AND EXPOSURE RECONSTRUCTION FOR CADMIUM I. Petridis <i>Aristotle University of Thessaloniki</i>
11.00-11.30	RISK ASSESSMENT OF EDCS IN EUROPE BASED ON HUMAN BIOMONITORING DATA S. Karakitsios <i>Aristotle University of Thessaloniki</i>
11.30- 12.00	NEUROSOME ESR 7: THE SCIENCE TO POLICY INTERACTION – DIFFERENT NEEDS OF DIFFERENT STAKEHOLDERS T. Bizjak <i>Jožef Stefan Institute</i>
12.00 - 12.30	MERCURY CONCENTRATIONS IN EDIBLE FISH FROM THE WESTERN MEDITERRANEAN SEA (BALEARIC ISLANDS AND MARSEILLE) M. Capodiferro¹, E. Junque¹, E. Marco¹, R.M. Lluís², J.O. Grimalt¹ <i>¹Institute of Environmental Assessment and Water Research (IDAEA-CSIC), Barcelona, Catalonia, Spain</i> <i>²General Direction of Public Health and Consumption, Ministry of Health, Family and Social Welfare, Government of the Balearic Islands, Palma, Mallorca, Spain</i>
12.30 - 13.00	BIOMONITORING OF LEAD IN A CHILDREN'S COHORT B. Fuentes¹, F. Ruggieri¹, O. Senofonte¹, A. Pino¹, S. Caimi¹, A. Nadiradze², T. Ugulava², L. Sturua³, N. Gabriadze³, A. Alimonti¹ <i>¹Istituto Superiore di Sanità, Rome, Italy</i> <i>²UNICEF Georgia, Tbilisi, Georgia</i> <i>³Georgian National Center for Disease Control and Public Health (NCDC), Tbilisi, Georgia</i>
13.00-16.30	BREAK
16.30-18.00	EVENING SESSION NEUROSOME
	Chairmen: Prof J. D. Grimalt, Prof T. Bizjak, Prof X. Coumoul
16.30-17.00	HIGH DIMENSION BIOLOGICAL ANALYSIS OF EARLY LIFE CO-EXPOSURE TO PLASTICIZERS AND METALS D. Sarigiannis <i>Aristotle University of Thessaloniki</i>
17.00- 17.30	THE SH-SY5Y NEUROBLASTOMA CELL LINE AS A MODEL TO EVALUATE THE EFFECTS OF ENVIRONMENTAL POLLUTANTS ON NEURODEVELOPMENT L. Lopez-Suarez, C. Chauvet, X. Coumoul <i>Université Paris Descartes-INSERM UMR-S 1124, Paris, France</i>
17.30-17.40	INTEGRATIVE AND CUMULATIVE HEALTH RISK FROM XENOBIOTICS EXPOSURE S. Karakitsios^{1,2}, V. Kokaraki³, A. Gotti^{3,4}, D.A. Sarigiannis^{1,2,3} <i>¹HERACLES Research Center on the Exposome and Health, Center for Interdisciplinary Research and Innovation, Aristotle University of Thessaloniki, Greece</i> <i>² Aristotle University of Thessaloniki, Department of Chemical Engineering, Environmental Engineering Laboratory, Thessaloniki, Greece</i> <i>³ School for Advanced Study (IUSS), Science, Technology and Society Department, Pavia, Italy</i> <i>⁴ EUCENTRE Foundation, Pavia, Italy</i>

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Friday, May 10, 2019

17:40-17:50 ADVERSE OUTCOME PATHWAYS ACTIVATED FROM EXPOSURE TO FLAME RETARDANTS AND CADMIUM

S. Karakitsios^{1,2}, A. Stratidakis³, D. Sarigiannis^{1,2,3}

¹HERACLES Research Center on the Exposome and Health, Center for Interdisciplinary Research and Innovation, Aristotle University of Thessaloniki, Greece

²Aristotle University of Thessaloniki, Department of Chemical Engineering, Environmental Engineering Laboratory, Thessaloniki, Greece

³School for Advanced Study (IUSS), Science, Technology and Society Department, Pavia, Italy

17:50- 18:00 DEVELOPMENT AND IN VITRO CYTOTOXICITY OF AMPHIPHILIC POLY-N-VINYLPYRROLIDONE NANOPARTICLES CARRYING INDOMETHACIN

S.E. Maravaki¹, A.K. Stratidakis^{1,2}, M.N. Tatzarakis¹, I. Tsatsakis¹, A.V. Goryachaya³, P.D. Stivaktakis¹, A. Berdiak⁴, D. Nikitovic⁴, M.I. Shtilman⁵, A.K. Rizos⁵, A.N. Kuskov^{5,6}, M.K. Tsilimbaris⁷, A.M. Tsatsakis^{1,3,6}

¹Laboratory of Toxicology, University of Crete, Voutes, Heraklion 71003, Crete, Greece

²Environmental Health Engineering, School for Advanced Studies IUSS, Pavia, 27100, Italy

³Department of Biomaterials, D. Mendeleev University of Chemical Technology of Russia, Moscow 125047, Russian Federation

⁴Laboratory of Anatomy-Histology-Embryology, University of Crete, Voutes, Heraklion 71003, Crete, Greece

⁵Department of Chemistry, University of Crete, Foundation for Research and Technology-Hellas, FORTH-IESL, Heraklion 71003, Crete, Greece

⁶Department of Technology of Chemical Pharmaceutical and Cosmetic Products, D. Mendeleev University of Chemical Technology of Russia, Moscow 125047, Russian Federation

⁷Department of Ophthalmology and the Vardinoyannion Eye Institute of Crete, University of Crete, Heraklion, Crete, Greece

CLOSING CEREMONY

Farewell Address – Closing Remarks

Saturday, May 11, 2019


08:00-09:00 BREAKFAST

10:00-13:00 EXCURSION TO KNOSSOS PALACE

Sunday, May 12, 2019


08:00-09:00 BREAKFAST

DEPARTURE OF PARTICIPANTS

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4 Training material

Lectures provided during the first training school have been uploaded and freely downloadable from the NEUROSOME web site (<http://www.neurosoma.eu>). The first two pages of each presentation is reported in Annex 1 of this report.

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5 ANNEX 1

First two pages of the presentations given at the first NEUROSOME training event.

Complete versions of all the presentations are freely downloadable from the NEUROSOM web site (<http://www.neurosoma.eu>).



NEUROSOME

NEUROSOME: First training event



H2020-MSCA-ITN-2017 GA - 766251

Heraklion, Crete, May 2019

NEUROSOME

Exploring The Neurological Exposome

Prof. Denis A. Sarigiannis, PhD^{1,2,3}

¹Aristotle University of Thessaloniki, Department of Chemical Engineering, Environmental Engineering Laboratory, University Campus, Thessaloniki 54124, Greece

²HERACLES Research Center on the Exposome and Health, Center for Interdisciplinary Research and Innovation, Balkan Center, Bldg. B, 10th km Thessaloniki-Thermi Road, 57001, Greece

³School for Advanced Study (IUSS), Science, Technology and Society Department, Environmental Health Engineering, Piazza della Vittoria 15, Pavia 27100, Italy

<http://www.enve-lab.eu>

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NEUROSOME

NEUROSOME: First training event



H2020-MSCA-ITN-2017 GA - 766251

Heraklion, Crete, May 2019

Marie Skłodowska Curie Action NEUROSOME

Budget: €3,493,845

Starting date 1st October 2017

Duration: 48 months

9 Beneficiaries


**AUTH, URV, IUSS, CSIC, JSI,
ISS, BURLO, TP, UPD**

5 Partners Organizations


**Johns Hopkins University, Emory University, Harvard
University, U.S. Environmental Protection Agency, UPCOM**

14 ESRs







NEUROSOME



Environmental Engineering Laboratory



Department of Chemical Engineering
School of Engineering
Aristotle University of Thessaloniki



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NEUROSOME: First training event
Heraklion, Crete, May 2019

NEUROSOME

Exploring The Neurological Exposome

Computational methods in toxicology

Denis A. Sarigiannis, PhD ^{1,2,3}, Spyros Karakitsios^{1,2}

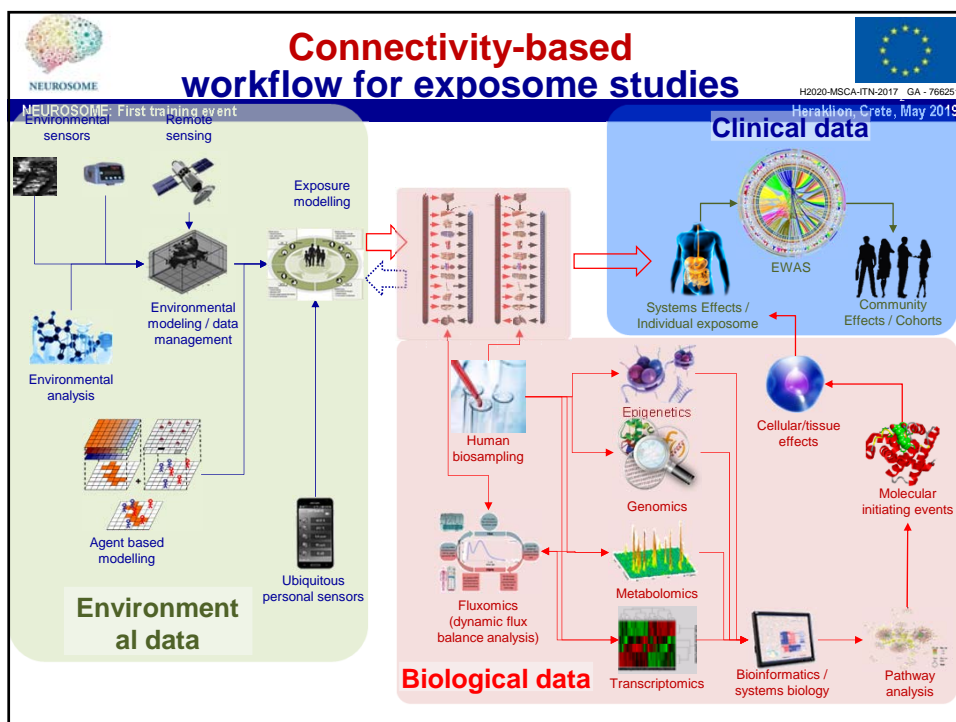
¹Aristotle University of Thessaloniki, Department of Chemical Engineering, Environmental Engineering Laboratory, University Campus, Thessaloniki 54124, Greece

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NEUROSOME: First training event



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Heraklion, Crete, May 2019

NEUROSOME

Exploring The Neurological Exposome

Integrative And Cumulative Health Risk From Xenobiotics Exposure

Spyros P. Karakitsios, MSc, PhD^{1,2}, V. Kokaraki³, A. Gotti, PhD^{3,4},
Denis A. Sarigiannis, PhD^{1,2,3}

¹ HERACLES Research Center on the Exposome and Health, Center for Interdisciplinary Research and Innovation, Aristotle University of Thessaloniki, Greece

² Aristotle University of Thessaloniki, Department of Chemical Engineering, Environmental Engineering Laboratory, Thessaloniki, Greece

³ School for Advanced Study (IUSS), Science, Technology and Society Department, Pavia, Italy

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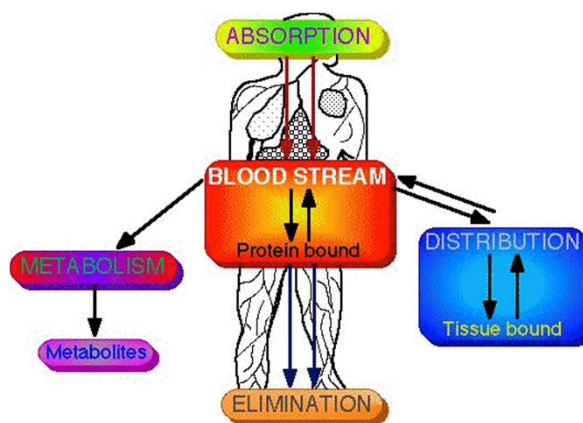


Development of generic multi-route lifetime PBBK model

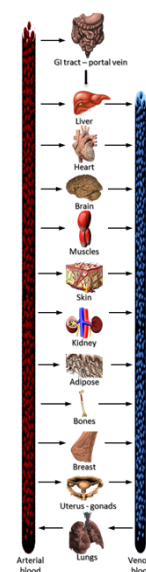


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Heraklion, Crete, May 2019

NEUROSOME: First training event



$$V_i \frac{dC_{ij}}{dt} = Q_i (CA_j - CV_{ij}) - Metab_{ij} - Elim_{ij} + Absorp_{ij} - Pr Binding_{ij}$$





Environmental
Engineering
Laboratory



Department of Chemical Engineering
School of Engineering
Aristotle University of Thessaloniki



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NEUROSOME: First training event

Heraklion, Crete, May 2019

NEUROSOME

Exploring The Neurological Exposome

High Dimension Biological Analysis Of Early Life Co-exposure To Plasticizers And Metals

**N. Papaioannou, O. Anesti, K. Gabriel,
S. Karakitsios, D.A. Sarigiannis**

*HERACLES Research Center on the Exposome and Health, Center for Interdisciplinary Research and Innovation, Balkan
Center, Bldg. B, 10th km Thessaloniki-Thermi Road, 57001, Greece*

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Current key challenges



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NEUROSOME: First training event

Heraklion, Crete, May 2019

- Co-exposures at low doses
- Chronic / long-term exposures at low doses
- The role of (epi)genetics, age-related susceptibility in toxicological responses
- Move towards improved public health protection via pre-emption prevention

The exposome paradigm brings together:

- Exposure science advances
- Mechanistic toxicology
- Molecular epidemiology
- Bioinformatics and big data analytics



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NEUROSOME: First training event

Heraklion, Crete, May 2019

NEUROSOME

Exploring The Neurological Exposome

Adverse Outcome Pathways Activated From Exposure To Flame Retardants And Cadmium

S. Karakitsios^{1,2}, A. Stratidakis³, D. Sarigiannis^{1,2,3}

1HERACLES Research Center on the Exposome and Health, Center for Interdisciplinary Research and Innovation, Aristotle University of Thessaloniki, Greece

2Aristotle University of Thessaloniki, Department of Chemical Engineering, Environmental Engineering Laboratory, Thessaloniki, Greece

3School for Advanced Study (IUSS), Science, Technology and Society Department, Pavia, Italy

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ADVERSE OUTCOME PATHWAYS



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Heraklion, Crete, May 2019

- Allen, T. E., et al. (2014): '*The adverse outcome pathway (AOP) conceptual framework has been presented as a logical sequence of events or processes within biological systems which can be used to understand adverse effects and refine current risk assessment practices in ecotoxicology.*'¹
- Ankley, G. T., et al. (2010): '*An AOP is a conceptual construct that portrays existing knowledge concerning the linkage between a direct molecular initiating event and an adverse outcome at a biological level of organization relevant to risk assessment.*'²
- Bal-Price, A., et al. (2015): '*The Adverse Outcome Pathway (AOP) framework provides a template that facilitates understanding of complex biological systems and the pathways of toxicity that result in adverse outcomes (AOs).*'³
- Becker, R. A., et al. (2015): '*An Adverse Outcome Pathway (AOP) represents the existing knowledge of a biological pathway leading from initial molecular interactions of a toxicant and progressing through a series of key events (KEs), culminating with an apical adverse outcome (AO) that has to be of regulatory relevance.*'⁴



Jožef Stefan Institute, Ljubljana, Slovenia



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The Science To Policy Interaction - Different Needs Of Different Stakeholders

NEUROSOME ESR 7

Tine Bizjak

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Content

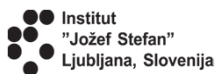


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1. Improving public health
2. Health in policies
3. Assessing health effects to inform decisions
4. Research needs



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Exposure to Endocrine Disruptors

Urinary PHTHALATE metabolite concentrations in the Slovenian GENERAL POPULATION

Agneta A. Runkel^{1,2}, Janja Snoj Tratnik^{1,2}, Darja Mazej¹, Milena Horvat^{1,2}

¹ Jožef Stefan Institute, Jamova cesta 39, 1000 Ljubljana, Slovenia

² Jožef Stefan International Postgraduate School, Jamova cesta 39, 1000 Ljubljana, Slovenia

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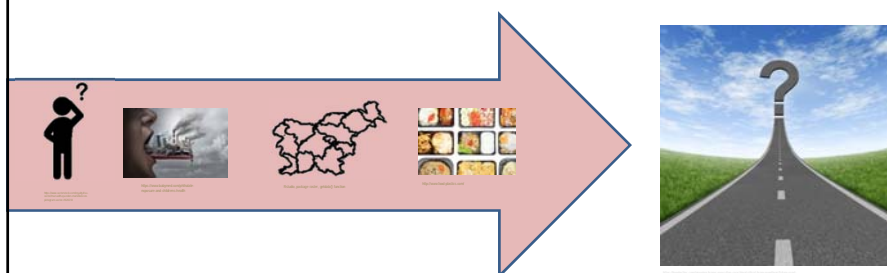


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Overview





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Exploring The Neurological Exposome

UNICEF Multiple Indicator Cluster Survey (MICS)

BIOMONITORING OF LEAD IN A CHILDREN'S COHORT

B. Fuentes¹, F. Ruggieri¹, O. Senofonte¹, A. Pino¹, S. Caimi¹, A. Nadiradze², T. Ugulava², L. Sturua³, N. Gabriadze³, A. Alimonti¹

¹Istituto Superiore di Sanità, Roma, Italy

²UNICEF Georgia

³Georgian NCDC

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Outline



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Biomonitoring Of Lead In A Children's Cohort

A collaborative project by

UNICEF Georgia, Tbilisi, Georgia

Istituto Superiore di Sanità, Rome, Italy

Georgian National Center for Disease Control and Public Health, Tbilisi, Georgia

Coordinated by Alessandro Alimonti



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Developmental Exposure To Heavy Metal Mixture: Neurobehavioral Analysis In In Vivo Models

Ö.Dinçkol, L.Ricceri, G.Calamandrei

*Center for Behavioral Sciences and Mental Health, Istituto Superiore di Sanità,
Rome, Italy*

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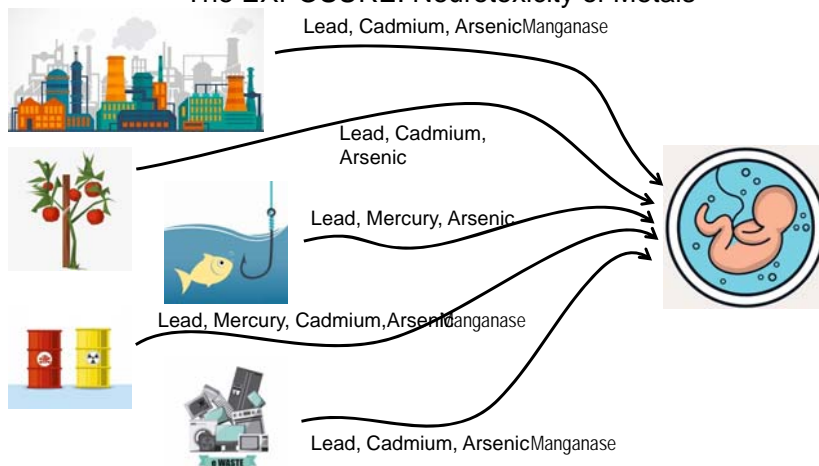


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The EXPOSURE: Neurotoxicity of Metals





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Mercury Concentrations In Edible Fish From The Western Mediterranean Sea (Balearic Islands, Marseille And Alicante)

Marco Capodiferro

Neurobiologist, PhD student
Department of Environmental Chemistry - Contaminants and Human Health
Institute of Environmental Assessment and Water Research (IDAEA-CSIC)

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Mercury (Hg)



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(Streets et al., 2017).



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Exposure Modelling And Exposure Reconstruction For Phthalates



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Prof. Denis Sarigiannis

Dr. Spyros Karakitsios

Vazha Dzhezheia

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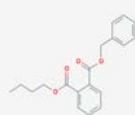
NEUROSOME



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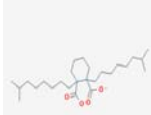
Benzyl Butyl
Phthalate
BBzP



Di-ethylhexyl
Phthalate
DEHP



Di-n-butyl
Phthalate
DBP



Di(isononyl)cyclo
hexane-1,2-
dicarboxylate
DINCH



Diisononyl
Phthalate
DiNP



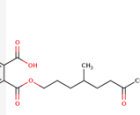
Monoisononyl
Phthalate
MiNP



Mono-(2-ethylhexyl)
Phthalate
MEHP



Mono-benzyl
Phthalate
MBzP



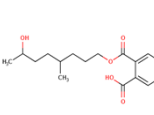
Mono-oxo-isononyl
Phthalate
oxo-MiNP



Mono(2-ethyl-5-
hydroxyhexyl)
Phthalate
5-OH MEHP



Mono(2-ethyl-5-
oxohexyl)
Phthalate
5oxo-MEHP



Mono(hydroxy-isononyl)
Phthalate
OH-MiNP



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Exposure Modeling And Exposure Reconstruction For Cadmium



Prof. Denis Sarigiannis

Dr. Spyros Karakitsios

Ir. Ioannis Petridis

Environmental Engineering Laboratory, Department of Chemical Engineering, Aristotle University of
Thessaloniki, Greece

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1. Cadmium Neurotoxicity
2. Human Exposure Concept – Forward Modeling
3. Cadmium Toxicokinetics
4. Data for model evaluation
5. Results
6. Discussion



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Risk assessment of EDCs in Europe based on human biomonitoring data



Prof. Denis Sarigiannis

Dr. Spyros Karakitsios

Ramin Rezaee

Environmental Engineering Laboratory, Department of Chemical Engineering, Aristotle University of
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1. Introduction
2. Forward Modeling
3. Bisphenol A
4. Phthalates (DEHP, DINP) and DINCH
5. Flame retardants (TCEP)
6. Perfluorinated compounds (PFOA and PFOS)
7. Discussion



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THE SH-SY5Y NEUROBLASTOMA CELL LINE AS A MODEL TO EVALUATE THE EFFECTS OF ENVIRONMENTAL POLLUTANTS ON NEURODEVELOPMENT

L. Lopez-Suarez, C. Chauvet, X. Coumoul

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- This project is part of NEUROSOME, an European integrated training network which investigates the causal associations of cumulative exposure to environmental chemicals of children and neurodevelopmental disorders.



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Neurotoxicity Testing For Pesticides Mixtures:

Research Applications And Regulations Under RLrs Concept

Marina Goumenou
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*Centre of Toxicology Science and Research
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Presentation Outline

