NEUROSOME

Exploring The Neurological Exposome

Nº1 MAY 2019

NEUROSOME is a European integrated training network (MSCA-ETN-ITN) which investigates the causal associations among genetic predisposition, cumulative exposure to multiple environmental chemicals of children and neurodevelopmental disorders. To have more information, please visit http://www.neurosome.eu/

In this first newsletter we are pleased to introduce the Early Stage Researchers (ESR) working in the project.

ESR1

Name: Antonios Stratidakis
**Email:** antonios.stratidakis@iusspavia.it
Institution: University School of Advanced Studies-IUSS
Supervisor: Professor Dimosthenis Sarigiannis

I graduated in the Department of Materials Science, University of Patras, Greece in 2014. During my Bachelor studies I participated as an exchange student at Uppsala University, under the Erasmus European Program. In 2016 I obtained my Master's Degree entitled "Advanced Polymeric and Nanostructured Materials", University of Patras. During my MSc studies I gained a Scholarship funding under the European Program "Development in Industrial Research and Technology", while I also worked as a teaching assistant. During 2016-early 2019 I was a member of the Laboratory of Toxicology, Department of Medicine, University of Crete, Greece, working under a Research Project entitled "Development of novel polymeric carriers for controlled release of Indomethacin. *In-vivo* and *In-vitro* control in ophthalmic models". My research activity mainly extends in environmental pollution, toxicology and neurotoxicology.

My research project in NEUROSOME focuses on developing an integrative biology approach for developing AOPs for neurodevelopmental disorders. With the use of several bioinformatics tools I will create systems toxicology hypotheses from human data, with emphasis on inter-organ system changes and with the use of bioinformatics algorithms I will identify the common nodes across several pathways perturbed from co-exposure to organic and metallic compounds. My goal is to identify the most critical regulatory pathway nodes that regulate the onset of pathways beyond cellular homeostasis-thus identify potential candidates for adverse outcome pathways.
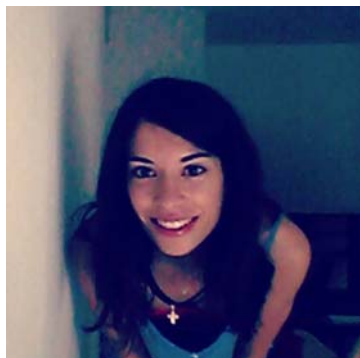
ESR2

Name: Kokaraki Venetia
Email: venetia.kokaraki@iusspavia.it
Institution: Institute for Advanced Study
Supervisor: Prof. Dimosthenis Sarigiannis

I graduated in Department of Applied Mathematics at the University of Crete (Greece) in 2012. I also have a Master's Degree in Operational Mathematics in Department of Mathematics and Applied Mathematics at the University of Crete in 2014. I was a member of the research team of the project ASMOPH, 'Excellence I' entitled Analysis, Stochasticity and Climate Modeling Simulation Phase in Institute of Applied and Computational Mathematics (IACM). Within this project, my Postgraduate dissertation entitled "Stochastics and Monte Carlo simulations for the description of time series of drug concentration in the blood of volunteers" was conducted. I have good knowledge of programming languages such as C, Fortran and Matlab and statistical packages SPSS and R language. In addition, I worked in Laboratory of Toxicology and forensic Chemistry of University of Crete medical school for the past two years where I have conducted several projects of statistical analysis and risk assessment.

My research project in NEUROSOME focuses on developing the proper modelling framework for estimating population external and internal exposure to xenobiotics, aiming to link external exposure metrics used in association studies to internal dosimetry metrics used in different toxicological testing strategies and identified omics signatures. The work will include the development of lifetime generic physiology-based biokinetic (PBBK) models for humans and animal models, able to describe internal exposure on susceptible developmental stages. Also the model will take into account interaction of multiple chemicals (mixtures interaction) at the level of metabolism, including enzyme inhibition and mechanism-based inhibition.

ESR3

Name: Byron Francisco Fuentes Juarez
Email: fuentes.byron@usac.edu.gt
Institution: D. Environment and Health, Istituto Superiore di Sanità
Supervisor: Alessandro Alimonti and Flavia Ruggieri

My project in NEUROSOME, aims at the collation of exposure to heavy metals related HBM data since the very early developmental stages, providing an overview of the actual population exposure to different potentially neurotoxic metals. These data will be also used for the validation of the PBBK model developed in ESR2 project.

ESR4

Name: Öykü Dinçkol
Email: odinckol@gmail.com
Institution: Istituto Superiore di Sanità
Supervisor: Dr. Gemma Calamandrei

I obtained my Bachelor Degree in "Molecular Biology and Genetics" from Istanbul University, Turkey and my Master's degree in "Neuroscience" from Istanbul Medipol University, Turkey. I completed one semester of my bachelor study in Maria Curie-Skłodowska University, Lublin, Poland with the ERASMUS student exchange program. I supported my education with internships during college and practice on in vitro studies. During my Master's studies, I worked with Assoc.Prof.Dr.Deniz Atasoy on neural circuits that regulate feeding behavior and metabolism by using cutting edge technologies such as opto-genetics and chemo-genetics. My main expertise is on animal behavior.

My research project in NEUROSOME focuses on identifying the in vitro and in vivo effects of co-exposure to metals. My research aims at characterize the neurobehavioral phenotype of murine models of exposure to multiple environmental stressors in pregnancy.

ESR5

Name: Marco Capodiferro
Email: marco.capodiferro@idaea.csic.es
Institution: Spanish Council for Scientific Research (CSIC)
Supervisor: Dr. Joan O. Grimalt

I obtained my Master's degree in "Neurobiology" and my Bachelor's degree in "Biological Science – Genetic & Molecular curriculum" at Sapienza University in Rome, Italy. Also, I have completed a 18-month traineeship in the "Center for Behavioral Science and Mental Health" at the Istituto Superiore di Sanitá (ISS) in Rome. During my academic studies, I attended several international seminars, workshops and conferences about neurotoxicology and neuroscience in general. Moreover, I followed different courses inherent to neuroscience that expanded my knowledge and improved my technical and practical skills.

My research within the NEUROSOME project is focusing on the analysis and evaluation of neuro-pollutants present in environmental samples from different media. My aims is to assess contamination levels of environmental means with which the studied population comes into contact, such as air, soil, water, settled dust and several food items either through the food web (metals, pesticides, POPs) or through food contact materials (plasticizers). Furthermore, I will pay attention on the role of neuro-pollutants on human health and environment in different biological samples coming from specific contexts.

ESR6

Name: Agneta Runkel
Email: agneta.runkel@ijs.si
Institution: Jožef Stefan Institute
Supervisor: Prof. Dr. Milena Horvat

I completed my Bachelor studies at the University of Bonn, Germany in Biology and Geography including a six-months Erasmus exchange at the National University of Ireland Maynooth. For my master's degree I joined the international study program Global Change Ecology at the University of Bayreuth, Germany. During that period, I completed a six months Erasmus traineeship in analytical chemistry at Stockholm University, Sweden and a three months internship at the Jozef Stefan Institute, Ljubljana, Slovenia. While studying in Bayreuth, I worked at the department of microclimatology and completed a science school on disturbance driven island ecology on La Palma, Canary Islands, Spain.

The aim of the PhD within the NEUROSOME project is to collect human samples from Mediterranean populations, select appropriate matrices and develop the methodology to assess the exposure levels of selected organic contaminants. This includes working with existing databases as well as targeted and non-targeted analysis of organic compounds.

ESR7

Name: Tine Bizjak
Email: tine.bizjak@ijs.si
Institution: Jožef Stefan Institute
Supervisor: dr. Branko Kontić

I obtained my Master's degree in General Toxicology and Environmental Health Risk Assessment at the University of Eastern Finland, Kuopio. I finished my Bachelor's degree in Environmental Sciences at the University of Nova orica, Slovenia. Moreover, I have completed two 6 month Erasmus+ traineeships in Norway and Finland. In parallel with my studies, I have been working part time as a consultant in the field of toxicology. I have also worked as a research assistant in the field of aerosol science, focusing on the simulated atmospheric aging of combustion missions (i.e. black carbon) for several months.

My research within the NEUROSOME project is focusing on the interaction of science to policy. My aims are to demonstrate the usefulness and benefits of integrating Health Impact Assessment (HIA) with environmental (SEA, EIA) and other assessments (SA, CBA, CEA) at strategic level of development planning and decision making for the purpose of improving the public health status. Additionally, I will focus on the evaluation and clarification of the Human Biomonitoring data value and importance in the context of exposure assessment.

ESR8

Name: Lorena Lopez Suarez
Email: lorena.lopez_suarez@etu.parisdescartes.fr
Institution: Université Paris Descartes
Supervisor: Prof. Xavier Coumoul

I obtained my bachelor degree in Biology at Universitat de Barcelona, Spain. During my degree, I did an internship in Oryzon Genomics, working in the genetic improvement of crops. I then obtained a Postgraduate Certificate in Education, and I worked as a science teacher until 2016, when I joined the international master program MSc Brain Sciences at University of Glasgow, Scotland. As part of this program, I did my research project in Dr Linington lab (Glasgow), studying the role of FGF2 in the neuroprotective factors expression in astrocytes in the context of neuroinflammation.

My research within the NEUROSOME project is focused on the development of central nervous system cellular valid models to study the effects of several environmental pollutants on neurodevelopment, and, by treating this cellular models with different environmental representative mixtures chemicals, identify the mechanism of action through which they exert their neurotoxicity.

ESR9

Name: Deepika
Email: deepika@urv.cat
Institution: Universitat Rovira i Virgili
Supervisor: Dr. Marta Schuhmacher

I have a Master's degree in Pharmaceutics (2014-2016) from Indian the Institute of Technology, Banaras Hindu University, Varanasi, India. I completed my bachelor´s degree from Guru Gobind Singh Indraprastha University, New Delhi, India (2010-2014) and was given gold medal for standing first in the university. Also, I was awarded academic excellence award for my outstanding performance during bachelor degree. I worked as a Scientist (Formulation Development- Topical Drug Delivery) in Dr. Reddy´s laboratories Ltd., India. I applied research experience of nearly 3 years in drug development (semisolid dosage forms like topical products, micro emulsion, liposomes, Nano particulate drug delivery) & personal care products (hair care). I was awarded with breakthrough contribution award (2017-2018) for innovation in Dr. Reddy´s Labs.

My objective in NEUROSOME is to develop the multimedia environmental exposure model for estimating contamination level of media (air, water, soil, food wed, settled dust), indoor exposure and food items and to validate it under different scenarios taking into account the parametric uncertainty. The strategy also includes development of an integrative modelling framework taking into account environmental exposure, internal exposure, biochemical interaction and biological response to assess the neurotoxic effect of chemicals mixture and to have a wider picture of the exposome and related health outcomes.

ESR10

Name: Ioannis Petridis
Email: ioannis.petridis89@gmail.com
Institution: Aristotle University of Thessaloniki
Supervisor: Prof. Dimosthenis A Sarigiannis

I received my Bachelor's degree in Computer and Electrical Engineering, at the University of Thessaly, Greece. I completed my Master's degree in Biomedical Engineering at the Technical University of Delft, Netherlands. After that, I joined "Athena" Research Institute for a 2-month internship and then the decentralized European agency CEDEFOP for a 9-month traineeship. At the same time, I wanted to further develop my analytical skills by remotely pursuing a second Master's degree at the Open University of Cyprus.

My project for NEUROSOME will focus in the development of Quantitative Structure Activity Relationships (QSARs) and Physiologically Based Biokinetic (PBBK) models with a special interest in compounds relevant to neurodevelopmental disorders. My research will also include analysis of omics data using regression and clustering methods in R, Python and Matlab. Analysis using Artificial Neural Networks will be also investigated.

ESR11

Name: Vazha Dzhedzheia
Email: vazhajejeya@gmail.com
Institution: Aristotle University of Thessaloniki
Supervisor: Prof. Dimosthenis A. Sarigiannis

I obtained my Bachelor's degree in Chemical Technology at Moscow Technological University (MIREA) and my Master's degree in Chemical Technology at Dmitry Mendeleev University of Chemical Technology of Russia. During my Master's degree I gained a broad knowledge of chemical laboratory operating procedures and data analysis techniques. I also attended several international conferences about advances in safety, toxicology and ecology.

My task in NEUROSOME is to combine information from relevant environmental contamination data, HBM data and personal sensors data to develop robust human exposure models. During this project, analysis of multiple types of environmental and human samples will be done using different analytical chemistry techniques (e.g. GC-MS/MS, ICP-MS, HPLC-MS). Information from environmental contamination data will be combined with personal sensors data aiming at calculation of personal exposure.

ESR12

Name: Ramin Rezaee
Email: raminrezaee1983@gmail.com
Institution: Aristotle University of Thessaloniki
Supervisor: Prof. Dimosthenis A. Sarigiannis

I graduated with a "PharmD" in Iran and I have been working in the field of pharmacology and toxicology as a research assistant. I have published over 70 original/review articles most of them in well-known journals of the field. I am familiar with using animal handling and behavioral tests, cell culture and molecular assays (western blotting and PCR), chromatography techniques for determination of contaminants in different matrices and risk assessment. During the last years, I, as an ERT (*European Registered Toxicologist*) have been collaborating with several journals as a reviewer and was recently assigned as an associate editor for "*Toxicology Reports*".

My mission in NEUROSOME is to identify the molecular signatures (transcriptomics and metabolomics) of co-exposure to neurotoxicants, in biosamples collected from the population studies to understand the response of co-exposure to multiple stressors at the different levels of biological organisation. Transcriptomics will examine neural differentiation–related gene expression following exposure to mixtures of most commonly found combinations of neurotoxicants, and metabolic studies will be done in urine and blood samples.

ESR13

Name: Ourania **Anesti**
Email: anesti.rania@gmail.com
Institution: ToxPlus SA.
Supervisor: Prof. Aristides Tsatsakis

I am a Doctor of Dental Science (DDS), specialised in endodontics with a MSc in oral biology from the National Kapodistrian University of Athens. I have a BSc and an MSc in homeopathic medicine from the International Academy of Classical Homeopathy and I am a certified Tomatis practitioner – level 2. I have been practicing dentistry, endodontics and homeopathic medicine in my private practice for several years, an experience that gave me the opportunity to see from up close and from the clinician's perspective how environmental, occupational and dietary factors impinge upon human health and onset or exacerbation of disease. For this reason, since 2016 I have been active in environmental health research collaborating with the University School of Advanced Study IUSS in Pavia, Italy and the HERACLES research center on the exposome and health at the Center for Interdisciplinary Research and Innovation of Aristotle University of Thessaloniki. I am currently a PhD student researcher at the Center for Toxicology and Forensic Science of the Medical School of the University of Crete under the supervision of Prof. A. Tsatsakis.

In NEUROSOME, I will work on something that will hopefully be the integrator of the results of other ESRs and other parts of the project. Namely, I will try to relate -omics, exposure and health outcome data using a combination of medical savvy and more formal 'big data analytics' approaches. My research will aim at unravelling the causal links between environmental exposure and disease

developing and using a prototype methodology for carrying out genome-exposome-wide health association studies (GEHAS).
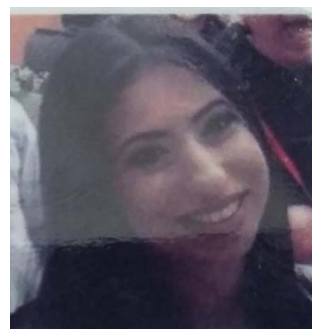
ESR14

Name: Irene Fragkiadoulaki
Email: eirinimbg@hotmail.gr
Institution: IRCCS Burlo Garofolo, Trieste - Italy
Supervisor: Luca Ronfani

I obtained my Bachelor's degree in "Molecular Biology and Genetics" at University of Thrace, Greece (2009-2015), where I specialized in the field of Cytogenetics. From 2015 until 2017 I worked as a Research Assistant at the Laboratory of Toxicology and Forensic Sciences, Medical School, University of Crete, Greece, where I specialized in the field of Toxicological Examinations and in vitro Toxicology. Since 2017, I am a PhD Candidate at the Laboratory of Toxicology and Forensic Sciences, Medical School, University of Crete, Greece, where I have been working in the field of in vivo Toxicology. I am a certified reviewer for international peer-reviewed journals such as "Toxicology Reports" and "Food and Chemical Toxicology", since 2017. Over the past years, I have attended several seminars and conferences on Toxicology in general and on animal control. My research experience covers Organ Toxicity, Clinical Toxicology and Molecular Biology.

In NEUROSOME, I will work on Genotyping, genome-wide analysis of cord blood samples collected from newborns participating in cohort studies. This will allow us to establish robust associations between health outcomes and gene polymorphisms implicated in neurodevelopment and /or response to xenobiotics.