DENAMIC

Developmental neurotoxicity assessment of mixtures in children

SEVENTH FRAMEWORK PROGRAMME

Newsletter 2

DENAMIC meetings

Since last newsletter, the consortium has come together for 2 progress meetings. At these meetings in Uppsala (October 2012) and Valencia (March 2013), experimental results as well as methodological approaches were presented and discussed among the partners. In October 2013, a progress meeting will be held in Frankfurt, with the focus on the development of biomarkers.

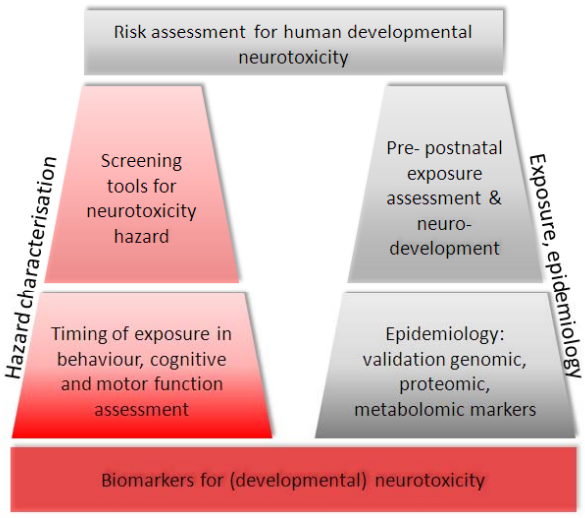
Furthermore, DENAMIC results have been presented at several international meetings, including the Society of Toxicology meeting 2013 in San Antonio (US), the International Neurotoxicology Association meeting 2013 in Egmond-aan-Zee (NL), and the Electrochemical Society meeting 2012 in Seattle (US).

Please note that the DENAMIC consortium organizes a scientific workshop on 'Novel tools and methods for the screening of chemicals for developmental neurotoxicity', 10-11 March 2014, in Amsterdam (NL).

DENAMIC progress

In the first 18 months of the DENAMIC project, a number of scientific deliverables were submitted to the EU, as planned. The deliverables include information on methods for the combined epidemiological data from the different cohorts, chemical hazard characterization in *in vitro* models, methods used in the different animal models, and preliminary data on the associations between chemical exposure and neurodevelopment in children.

The consortium is currently preparing for the first periodic review.



Coordinator:
Pim Leonards
Institute for Environmental Studies
VU University Amsterdam
+31 20 5989 509
pim.leonards@ivm.vu.nl

Subcoordinator:
Milou ML Dingemans
Institute for Risk Assessment Sciences
Utrecht University
+31 30 2534387
m.dingemans@uu.nl

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For more information **www.denamic-project.eu**

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DENAMIC hazard

In the first 18 months of the DENAMIC project, selected chemicals and mixtures thereof were tested in several *in vitro* models. The chemicals were tested for their ability to disrupt cell viability in neuronal cells, bind to thyroid hormone transport proteins and inhibit acetylcholine esterase activity. Mixture effects could in several cases be predicted by concentration addition, but not in all cases.

In parallel, it is being investigated whether developmental exposure to the chemicals-of-interest affect cognitive and motor functions in animal models. This information can be used in human risk assessment for developmental neurotoxicity, and the evaluation of the predictivity of *in vitro* data.

DENAMIC epidemiology

In DENAMIC, differences in prenatal and neonatal exposure to a selected number of suspected neurotoxic environmental pollutants in four different European regions is investigated. Data and samples from existing European cohorts with different exposure profiles from Norway, Netherlands, Slovakia and Spain were harmonized and information on available samples collected. Organophosphate pesticide metabolites were analysis in a first set of Spanish cohort samples. These studies will also be used to study possible associations between the selected environmental pollutants with neurodevelopmental outcome, in particular cognitive development (e.g. ADHD). A new tailor-made cohort of mother-child pairs was set up (LINC), and recruitment of this cohort is ongoing.

Microsensor for neurotransmitter detection

The effects of neurotoxic chemicals on neurotransmitter levels are studied in different biological fluids and tissues using a fast method of qualitative and quantitative analysis by using microsensors, as well as mass spectrometry high-throughput screening. Work is ongoing on the development of microsensors for the detection and quantification of neurotransmitters in low volume samples.

DENAMIC publications

- de Groot MW, Westerink RH, Dingemans MM. Don't judge a neuron only by its cover: neuronal function in *in vitro* developmental neurotoxicity testing. Toxicol Sci. 2013;132(1):1-7.
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- Quaak I, Brouns MR, Van de Bor M. The dynamics of autism spectrum disorders: How neurotoxic compounds and neurotransmitters interact. Int. J. Environ. Res. Public Health. 2013;10:3384-3408.