

# **DNTOX**

**Toxicity testing and  
model development in vitro  
with a focus on developmental &  
adult neurotoxicity**



'DNTOX is based on my 20+ years of experience in the field of in vitro toxicology. We are making important steps toward regulatory acceptance of the developmental and adult neurotoxicity in vitro methods.'

Prof. Dr. Ellen Fritsche  
Scientific Managing Director

DNTOX GmbH uses human cell models and enables artificial intelligence-based screening with in-house developed software.

The DNTOX in vitro test system is comprised of a set of multicellular test methods that are based on human neural progenitor cells (hNPCs) and human induced pluripotent stem cells (hiPSCs). These cells are cultivated as free-floating or plated and adherent 3D spheres as well as 2D monolayer cultures. Our cell models can be used to study several key neurodevelopmental and neuronal processes.

✓  
2D & 3D  
in vitro  
systems

✓  
human-  
based

✓  
multicellular &  
multiplexed

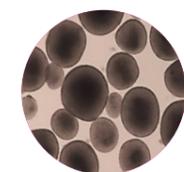
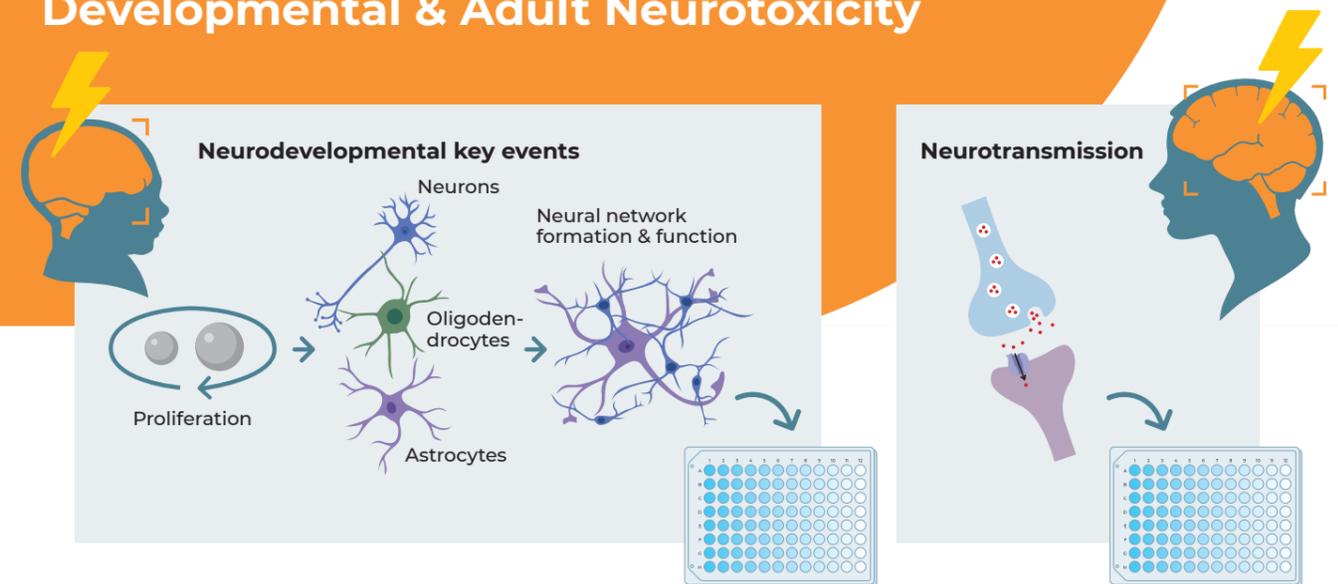
✓  
Internationally  
and officially  
recognized

✓  
Proof of  
Concept

✓  
OECD  
recommends  
testing

## In vitro test systems

### Developmental & Adult Neurotoxicity



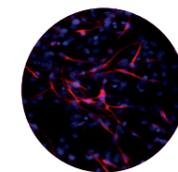
#### Proliferation

is evaluated by measuring sphere size increase or by BrdU incorporation into newly synthesized DNA.



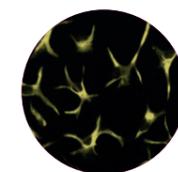
#### Migration

of radial glia, neurons and oligodendrocytes can be assessed manually by using brightfield microscopy or automatically based on ICC-stained cells by an in-house developed software.



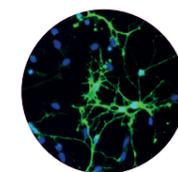
#### Differentiation to neurons & neurite outgrowth

is identified based on a TUBB3 immunocytochemical staining and using a Convolutional Neural Network (CNN).



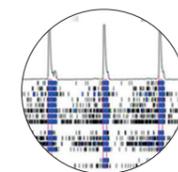
#### Differentiation to astrocytes

is identified based on a GFAP immunocytochemical staining and using a Convolutional Neural Network (CNN).



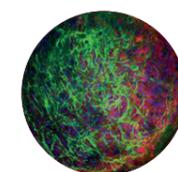
#### Differentiation to oligodendrocytes

is identified based on a O4 immunocytochemical staining and using a Convolutional Neural Network (CNN).



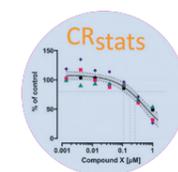
#### Neural network formation & electrical function

is assessed by using microelectrode arrays (MEAs), thus providing information on electrical activity, firing patterns, and synchronicity of the neural networks.



#### 3D BrainSpheres

are differentiated on microelectrode arrays (MEAs) to identify effects on different neurotransmitter receptor subtypes. For acute and chronic neurotoxicity testing.



#### Computational Biology & Bioinformatics

We develop machine learning-empowered microscopy image analysis and statistical software to quantify, evaluate and classify data.

and more...



Initial recommendations

[https://one.oecd.org/document/ENV/CBC/MONO\(2023\)13/en/pdf](https://one.oecd.org/document/ENV/CBC/MONO(2023)13/en/pdf)



National Institutes of Health  
Turning Discovery Into Health

115+ chemicals · 2021–2026



120 compounds · 2019–2020



Ministry of Environment  
of Denmark  
Environmental  
Protection Agency

28 compounds · 2019–2022



The system is unique.

**6 Strengths:**  
The test procedure offers convincing advantages for customers.



No animal testing  
**Advantage: Company image gain**



Significantly faster results  
(6 weeks instead of 12 months)  
**Advantage: New scope for action**



3D human-based, multiplexed & multicellular  
**Advantage: Human physiological relevance**



Optimised processes, automated & AI-supported  
**Advantage: More reproducibility**



Reduced use of materials and personnel  
**Advantage: Considerably cost-effective**



Scientifically validated, recommended by OECD  
**Advantage: Approaching regulatory acceptance**

Get in touch with us!



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