



## Patient-derived 2D & 3D cell models for peripheral neuropathies

**Commonly used acronym:** SCREEN4PN

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### Organisation

**Name of the organisation** University of Antwerp (UAntwerpen)

**Department** Departement Biomedische Wetenschappen

**Specific Research Group or Service** Peripheral Neuropathy Research Group

**Country** Belgium

**Geographical Area** Flemish Region

## SCOPE OF THE METHOD

<b>The Method relates to</b>	Human health
<b>The Method is situated in</b>	Basic Research, Education and training, Translational - Applied Research
<b>Type of method</b>	In vitro - Ex vivo
<b>Specify the type of cells/tissues/organs</b>	induced pluripotent stem cells

## DESCRIPTION

### Method keywords

Neuromuscular junction  
Peripheral neuropathy  
Schwann cells  
iPSC-derived neurons  
myelination  
axonal degeneration  
organoids  
demyelination  
remyelination

### Scientific area keywords

biomedical research  
Induced pluripotent stem cells  
3D organoid models  
neuromuscular assembloids

## Method description

Inherited peripheral neuropathies (IPNs) are a group of diseases associated with mutations in various genes with fundamental roles in the development and function of peripheral nerves. Over the past 10 years, significant advances in identifying molecular disease mechanisms underlying axonal and myelin degeneration, acquired from cellular biology studies and transgenic fly and rodent models, have facilitated the development of promising treatment strategies. However, no clinical treatment has emerged to date. This lack of treatment highlights the urgent need for more biologically and clinically relevant models recapitulating IPNs. For both neurodevelopmental and neurodegenerative diseases, patient-specific induced pluripotent stem cells (iPSCs) are a particularly powerful platform for disease modeling and preclinical studies. In our laboratory, we are currently developing human derived organoid models as a tool to gain novel insights in the disease mechanisms of hereditary neuromyopathies and validate therapeutic molecules.

## Method status

Still in development

## PROS, CONS & FUTURE POTENTIAL

### Advantages

We replace and reduce the development of animal models by creating human derived organoids.

## REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

### References

Advances and challenges in modeling inherited peripheral neuropathies using iPSCs. Van Lent J, Prior R, Pérez Siles G, Cutrupi AN, Kennerson ML, Vangansewinkel T, Wolfs E, Mukherjee-Clavin B, Nevin Z, Judge L, Conklin B, Tynismaa H, Clark AJ, Bennett DL, Van Den Bosch L, Saporta M, Timmerman V. *Experimental Molecular Medicine*, 2024;56(6):1348-1364. doi: 10.1038/s12276-024-01250-x

### Links

[SCREEN4PN Platform](#)

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