Our mitochondrial stem cell research group is located at the Department of Clinical Medicine (K1), University of Bergen and is part of Neuro-SysMed, the Centre of Excellence for Clinical Research in Neurological Disorders, Department of Neurology at Haukeland University Hospital.

We are using stem cells transformed from a patient's own fibroblasts to study mitochondrial diseases caused by *POLG* mutations. The goal of our research group is to conduct iPSC-based in vitro model system studies to increase the understanding of mitochondrial diseases, identify the underlying mechanisms of this common mitochondrial diseases and develop an iPSC-based platform to test therapeutic agents.

We have established the capabilities and facilities required for the reprogramming and differentiation of iPSCs, enabling the study of neuronal cells from patients and healthy controls. Validated iPSCs can differentiate into neural stem cells (NSCs) and compartmentalized neuronal subtypes, as well as astrocyte/glial cell populations. We have also recently developed 3D brain organoids to study disease mechanisms and test treatments.

Our broad research aim is to determine the biological and pathological basis of neurodegenerative diseases associated with mitochondrial dysfunction, and we aim to develop this and conduct more in-depth molecular phenotyping studies. Since the group is also part of the Neuro-SysMed Center, we will use our model and stem cell approach to study other neurodegenerative diseases such as Parkinson's and Alzheimer's.

**See also our group website:**

[Mitochondrial Stem Cell Research | Mitochondrial Medicine & Neurogenetics (MMN) | UiB](https://www.uib.no/en/rg/mitochondrial_medicine/103070/mitochondrial-stem-cell-research)

**Relevant publications:**

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* N Balafkan, S Mostafavi, M Schubert, R Siller, KX Liang, G Sullivan, LA. Bindoff, Method for differentiating human induced pluripotent stem cells toward functional cardiomyocytes in 96-well microplates, Sci Rep. 2020 Oct 28;10(1):18498. doi: 10.1038/s41598-020-73656-2.
* X Liang, CK Kristiansen, GH Vatne, Y Hong, LA Bindoff, Patient-specific neural progenitor cells

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