



Universität  
Basel

## Research Project

### Single organelle size sorting by a nanofluidic device

#### Third-party funded project

**Project title** Single organelle size sorting by a nanofluidic device

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**Organisation / Research unit**

Departement Physik / Theoretische Physik (Bruder)

Departement Biozentrum / Structural Biology (Stahlberg)

**Department**

**Project start** 01.08.2018

**Probable end** 31.07.2022

**Status** Completed

Reduction of the number and size of mitochondria in dopaminergic neurons of the central nerve system is the hallmark of neurodegenerative Parkinson's disease. We here propose to establish a method to quantify the number and size of mitochondrial organelles, to provide a direct diagnostic tool for Parkinson's disease. The proposed single-organelle size sorter is shown in the figure (not to scale). Nanochannels with a variable height are realized in PDMS, using gray scale lithography and bonded on a glass slide. A single cell is lysed with osmotic pressure and the solution is introduced into a nanochannel via capillary forces. The bioparticles are sterically trapped at different locations, thus static size sorting is achieved. The width of the channels is sufficiently large to avoid clogging so that the particles reach their steric trapping position. Size distribution and density of certain bioparticles are evaluated under an optical microscope.

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