

## Tuning interneurons to improve cognition in Down Syndrome

<b>Project partners</b>
Universities of Basel and Freiburg
<b>Project duration / Awarded funding</b>
01.02.2019 – 30.01.2021 / 33.971 €
<b>Short description of the project</b>
The researchers of this neurophysiology project are investigating the cellular causes of cognitive disorders in Down's syndrome or trisomy 21. The central question is to what extent the altered activity of certain inhibitory nerve cells in the brain contributes causally to the disorder and whether a targeted modification of their excitability can reduce cognitive impairments.
<b>Concrete implementation of the project (What was the funding used for?)</b>
<ul style="list-style-type: none"> <li>• A Down Syndrome mouse model that allows the optical identification of specific interneurons was generated with the support of two Eucor-funded research assistants</li> <li>• Supported by two cross-border Master students, we experimentally characterized this mouse model using complementary techniques in labs in Basel and Freiburg</li> <li>• Technological expertise was transferred between labs to establish Ca<sup>2+</sup> recordings in freely moving mice</li> <li>• We organised several workshops on inhibition in neurological disorders</li> </ul>
<b>Project result(s) and continuation of collaboration</b>
We found that the number of excitatory connections onto a group of inhibitory neurons that express parvalbumin is increased in Down Syndrome mice. This causes increased inhibition in the hippocampus, a likely cause for impaired learning and memory in Down Syndrome. Ongoing research aims at identifying possible treatments.
<b>Further information (links, articles, photos)</b>
<a href="https://www.neurex.org/events/events-to-come/item/476-releasing-the-brake-on-cognition-altered-inhibition-in-down-syndrome-and-aging">https://www.neurex.org/events/events-to-come/item/476-releasing-the-brake-on-cognition-altered-inhibition-in-down-syndrome-and-aging</a> <a href="https://www.nwg-goettingen.de/2021/module/symposienliste/abstracts.asp?sypid=33">https://www.nwg-goettingen.de/2021/module/symposienliste/abstracts.asp?sypid=33</a>