

## LS23-070 - An interdisciplinary approach to learn and test the causal mapping between neural network dynamics and behavior

### Zusammenfassung

Previous research has investigated how brains encode animal behavior and found that it is linked to how large groups of nerve cells work together in tight coordination. We still don't understand how the actions of such large groups of nerve cells is controlled. To solve this, we bring together a team of experts in artificial intelligence, computational biology and neurobiology. We will study a small creature, a worm called *C. elegans*, which has only 302 nerve cells and can therefore be better studied and understood. For example, it is possible to visualize brain activity including all of its individual nerve cells. We will use new computer techniques to learn from its brain activity and simulate how its nerve cells communicate. Literarily, we will learn how to read its mind! We will then test our ideas by using special genetic tricks to manipulate brain activity with light, in order to control specific groups of nerve cells and then observe how this affects decision making of the worm.

Wissenschaftliche Disziplinen:

Neurobiology (33%) | Artificial neural networks (34%) | Mathematical modelling (33%)

Keywords:

*C. elegans*, computational neuroscience, neural networks, neuronal circuits & behavior, optogenetics

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Status: Vertrag in Vorbereitung

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Weiterführende Links zu den beteiligten Personen und zum Projekt finden Sie unter

<https://www.wwtf.at/funding/programmes/ls/LS23-070/>