

Presentation of scientific institutions

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Better data – better science

NFDI Neuroscience: an initiative to promote efficient data management for neuroscience



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Information technology changes our lives with offers of novel tools and services at an unprecedented rate. Today, it is sometimes hard for us to understand how in the past we had managed to get by without such technologies at our fingertips – for example, a quick look at the street map on our mobile phone. Yet, many of these developments once were difficult to imagine. In science, the digital transformation has long begun and is bound to change our style of doing research in similarly radical ways. Through standardized interfaces, shared tools, and common vocabularies researchers will benefit from the advantages of professional research data management (RDM), such as comprehensive data descriptions, easy data exchange among collaborators, or the ability to navigate ever more complex and large data. In this way, modern expectations including reproducibility and practical reusability are met. However, the digital transformation requires researchers to adapt their data acquisition and analysis from custom “home-made” procedures towards standardized solutions co-designed by researchers and data scientists. As in the non-scientific world, the transformation requires expert guidance in choosing the right tools in a complex landscape of data management solutions.

To support the adoption of professional RDM, the DFG coordinates a funding program called the *Nationale Forschungsdateninfrastruktur* (NFDI, <http://dfg.de/nfdi>). In this context, the consortium NFDI Neuroscience formed in 2018 as an open community network. The aim of NFDI Neuroscience is to act as a platform that brings together solutions for RDM challenges emerging at national and

international levels, making these solutions available to researchers on a large scale. Thus, neuroscience data should be handled in accordance with the FAIR principles (<https://doi.org/10.1038/sdata.2016.18>) by using appropriate and interoperable solutions for data storage, data annotation, data integration, and data processing. NFDI Neuroscience pursues a concept where the consortium acts as a direct point of contact for researchers regarding RDM issues. It will bring service providers and users together and push forward new developments based on needs identified by the neuroscientific community. As such, NFDI Neuroscience will build up a competence network interwoven with the neuroscientific community. The initiative is supported by the NWG and the Bernstein Network for Computational Neuroscience.

NFDI Neuroscience has held a series of community workshops (see also Ritzau-Jost & Seidenbecher (2019) *Neuroforum* 25(4):279–280) focusing on various groups involved in the process: individual researchers, large research consortia (such as CRCs), and providers of RDM services and expertise. Across all groups, the necessity for a more coherent approach to tackle RDM was recognized. Specific implementations and guidelines were identified as potential areas of NFDI Neuroscience involvement. In addition, NFDI Neuroscience could facilitate discussions in the community on overarching concerns, such as measures for ensuring the quality of curated data records. In particular, since broad training in RDM topics was often requested, NFDI Neuroscience is developing teaching activities including an introductory training workshop “Research Data Management in Neuroscience” (see <https://nfdi-neuro.de> for details).

Just like services such as online street maps once were science fiction, fully automated, standardized services for data acquisition and analysis may still seem like fantasy, given the daunting complexity and heterogeneity of the data. Nevertheless, more and more viable solutions appear that often inspire specifically the young generation of scientists to finally tackle the RDM challenges. After a recent RDM workshop for the Bernstein Network’s SMARTSTART program, one of the students confirms: “In the few months since the workshop I

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could already profit from the presented content, be it through minor things like references to data-analysis packages or more long-lasting aspects like taking the extra time to produce well-documented code and relevant meta-data.”

Research data is at the core of scientific progress, and we as neuroscientists have a responsibility to maximize its impact now and in the future. Thus, research data needs to be handled in a rigorous, fully documented fashion to make it sustainable.