



Cutting edges in neuroscience to exceed borders

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Neurosciences have obtained fundamental insights in the past decades into brain functions. On the basic physiological level, neurosciences teach us how the brain receives sensory information from the world around us, how it creates its images, performs judgments, and takes actions. By creating images, the human brain developed self-consciousness. Understanding the brain's functions provides important information about who we are. Hence, neurosciences are a major foundation stone of humanities and inseminate social and cultural developments. At the same time, the brain's organization principles—the way how emotional functions influence an individual's judgments and actions—give rise to human conflicts. In this world in which peace is at risk in the Ukraine crisis aftermath, knowledge of these principles may also help us establish living conditions, in which human conflicts are solved and in which peace, freedom, and prosperity can thrive with a mindset that exceeds borders.

Modern neurosciences were founded in the closing 19th century by developments in histochemistry and electrophysiology. These developments were the basis for subsequent studies which allowed us to elucidate the brain's structure and functions. Developmental biological studies in the second half of the last century provided the groundwork for our current understanding of how the brain shapes itself, how the brain grows, matures, and performs its functions, and how the brain responds to injury. Basic and clinical neurosciences vividly stimulated each other along this way, and they remain seeds of mutual insemination still today. This mutual benefit is in part enabled by the fact that the mammalian brain resumes ontogenic principles upon injury [1, 2]. Developments in molecular biology and genetics accelerated developments in neurosciences at the offspring of the new millennium, enabling understanding of the signal pathways that control neuronal functions in the healthy and the injured brain. Unfortunately, in many disease areas, these insights still did not translate into the development of disease therapies. The development of therapeutic options in highly prevalent diseases such as stroke, multiple sclerosis, or Alzheimer's disease remains a huge challenge. In the globalized world of the 21st century, the search for new treatments unites neurologists and neuroscientists from various countries. Very recently, neurosciences were inspired by methodological developments in brain imaging (two-photon microscopy, superresolution microscopy, light-sheet microscopy), which enables us to obtain dynamic views of neurobiological processes from the nanoscopic to the whole organ level, even *in vivo* in real-time. At present, bioinformatics (network analysis, deep learning algorithms, computational models) boost our possibilities to extract scientific information from the brain, utilizing large data sets from neuroimaging, electrophysiology, molecular biology, and pharmacology studies for testing structure-function

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relationships. These new approaches strongly facilitate the identification of disease biomarkers or treatment targets, via which biological processes can be modified. To which degree these new methods will change our understanding of the brain and perhaps result in the implementation of new therapies, still needs to be proven.

In this age of rapidly advancing research technologies, increasing data amounts, and increasing knowledge generated by a growing neuroscience community, research progress strongly depends on the global availability of scientific information. Data access should not be restricted by financial charges, which limits data access by researchers from less wealthy environments and lower-income countries. To enable free data access, the open access movement came up at the turn of the millennium. Through the so-called golden way, the publisher makes all articles and related contents available for free immediately on the journal's website [3]. In such publications, articles are usually licensed for sharing and reuse via creative commons licenses. To cover the costs, the majority of open access journals bills the authors for article processing charges. In many cases, article processing charges cannot be afforded by authors from low-income countries.

Exploration of Neuroscience is a strictly peer-reviewed open-access online journal. The journal publishes papers of the highest quality and significance in all areas related to basic and applied neurosciences without article processing charges. It is simply a scientific quality that counts. Priority is given to work identifying novel insights into nervous system structure and function, disease mechanisms, molecular biomarkers, therapeutic targets, and treatments. Particular emphasis is given to studies providing advancements to the clinical translation of basic research findings. Appropriate topics include, but are not limited to, vascular neurology, neuroimmunology, neurooncology, neurodegenerative diseases, movement disorders, cognitive disorders, mood disorders, neurogenetics, sleep disorders, and epilepsy. Basic research topics of interest include neuronal degeneration and plasticity, glial biology, cerebrovascular physiology, and neuroendocrine systems, besides others. Both central and peripheral nervous systems and diseases are addressed. Studies presenting innovative methodological developments including structural and functional neuroimaging, electrophysiological network analysis, inducible transgenic or knockout systems and, specifically, optogenetics, are particularly invited, since they may pave the way for subsequent neurophysiological and pathophysiological studies. Studies on new treatment concepts, including cell-based therapies, biologicals and gene therapies, are highly welcome, as are studies examining pharmacological and rehabilitative treatments or prevention strategies. We aim to attract impactful articles *in vitro* and *in vivo* from subcellular to whole organ levels deepening our understanding of the healthy and the injured brain with the potential of improving neurological disease outcomes. Original research, reviews, meta-analyses, case reports, commentaries, perspective articles, and letters to the editor will be considered if solidly grounded with novel concepts and insights. Papers will be judged based on stringency, originality, and innovation potential. Outstanding papers will be featured in an editorial. With this journal, we hope to set new standards in the field that promote rigorous research studies, advance basic and clinical neurosciences, facilitate progress in neurological disease diagnostics and treatment and enable information access across borders.

Declarations

Author contributions

The author contributed solely to the work.

Conflicts of interest

The author declares that there are no conflicts of interest.

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