

Special Issue on **The Riddle of Nature and Nurture in Neurobiological Mechanisms of Cognitive Development**

CALL FOR PAPERS

How do nature and nurture interact to sculpt the functional architecture of the brain during ontogeny? Since the neuronal organization determines cognitive capacities of human and nonhuman animals encompassing neuronal processes like attention, memory formation, problem solving, or decision making, this question is of central importance to understand developmental routes leading to neurotypical and impaired cognitive development. On the one hand, the genetic endowment defines developmental steps, susceptibility towards positive or aversive experiences, or risk to develop psychiatric disorders. On the other hand, environmental factors guide individual development by shaping cellular differentiation processes and by permanently modifying gene expression via epigenetic mechanisms. The relative importance of specific factors onto neuroplasticity may vary depending on the developmental stage, cognitive functions, and the underlying neuronal modules. To gain a deeper understanding of the synergistic role of different factors and their adaptive advantages, we need research investigating the neurobiological basis of ontogenetic plasticity. Interdisciplinary and comparative approaches are well suited to highlight this neglected perspective.

This special issue focuses on human and animal research investigating specific and interactive environmental effects onto functional brain development and addresses studies which combine neuronal (cellular, genetic, or anatomical) and behavioral approaches. Comparative studies investigating species-dependent differences in ontogenetic plasticity as well as reviews discussing adaptive neuroplasticity are especially welcome. This research may unravel convergent mechanisms underlying ontogenetic plasticity and may identify approaches to define cellular, genetic, or molecular mechanisms underlying cognitive development in an effort to inspire translational research recognizing potential early interventions after aversive experiences. Since protective or aversive experiences profoundly impact emotional processing, which is intimately connected with cognition, studies investigating interactions between emotional and cognitive development are also relevant.

In sum, this special issue highlights cognitive development from a multimethodological neurobiological perspective and is therefore of potential interest for researchers from different fields interested in the nature-nurture debate about functional brain development.

Potential topics include but are not limited to the following:

- ▶ Ontogenetic influences of sensory or social experience onto the neuronal foundations of cognitive abilities or complex behavior (enrichment, deprivation, and cross-modal plasticity studies combining)
- ▶ Structure-function interrelations of experience-dependent cognitive development
- ▶ Epigenetic mechanisms mediating experience-dependent cognitive development
- ▶ Experience-dependent development of cerebral asymmetries
- ▶ Positive influences onto neuronal mechanisms compensating aversive experiences (e.g., stress)
- ▶ Neuronal foundations of interactive cognitive and emotional development
- ▶ Influences of environmental experience on the risk to develop psychiatric disorders
- ▶ Genotype-dependent differences in ontogenetic neuroplasticity
- ▶ Comparative studies on ontogenetic neuroplasticity

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/np/ridnu/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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