

The Ernst Strüngmann Forum

Science is a highly specialized enterprise—one that enables areas of enquiry to be minutely pursued, establishes working paradigms and normative standards, and supports rigor in experimental research. Some issues, however, do not fall neatly into the purview of a single disciplinary field and for these areas, specialization can actually hinder conceptualization and limit the generation of potential problem-solving approaches. The Ernst Strüngmann Forum was created to address such topics.

Founded on the tenets of scientific independence and the inquisitive nature of the human mind, the Ernst Strüngmann Forum is dedicated to the continual expansion of knowledge. Its activities promote interdisciplinary communication on high-priority issues encountered in basic science. Through its innovative communication process, the Ernst Strüngmann Forum provides an intellectual haven within which experts scrutinize high-priority issues from multiple vantage points.

This process begins with the identification of themes. By nature, a theme constitutes a problem area that transcends classic disciplinary boundaries—a topic of high-priority interest that requires concentrated, multidisciplinary perusal. Proposals are received from leading scientists active in their field and reviewed by an independent Scientific Advisory Board. Once approved, a steering committee is convened to refine the scientific parameters of the proposal and select participants. Approximately one year later, a central gathering, or Forum, is held to which circa forty experts are invited. Expansive discourse is employed to address the problem. Often, this necessitates reexamining long-established ideas and relinquishing previously held perspectives, yet when accomplished, novel insights begin to emerge. Resultant ideas and newly gained perspectives from the entire process are disseminated to the scientific community for further consideration and implementation.

Preliminary discussion on this theme began in 2015, when April Benasich approached me with the wish to extend exploration into dynamic brain coordination and synchrony by utilizing a developmental perspective. Urs Ribary joined us in preparing the proposal and from April 15–17, 2016, the Program Advisory Committee (Yehezkel Ben-Ari, April Benasich, Julia Lupp, Charles Nelson, Urs Ribary, Wolf Singer, and Terry Sejnowski) met to refine the scientific framework for this Forum, which was held in Frankfurt am Main from March 5–10, 2017.

This volume synthesizes the resulting discourse that took place between a diverse group of experts and is comprised of two types of contributions. Background information is provided on specific aspects of the overall theme. These chapters, drafted before the Forum, initiated the discussion at the Forum; they have been peer-reviewed and subsequently revised to provide an

up-to-date assessment of these topics. In addition, Chapters 4, 7, 11, and 15 provide an overview of the working groups. These chapters are not consensus documents: their intent was to summarize the discourse, to expose diverging opinions, and to highlight areas where future enquiry is needed.

An endeavor of this kind creates its own unique group dynamics and puts demands on everyone who participates. Each invitee played an active role and for their efforts, I am grateful to all. A special word of thanks goes to the Program Advisory Committee, to the authors and reviewers of the background papers, as well as to the moderators of the individual working groups (Terry Sejnowski, Charles Nelson, Tomáš Paus, and Sylvain Baillet). The rapporteurs of the working groups (Nick Spitzer, Matthias Kaschube, Marina Bedny, and Jennifer Gelinas) deserve special recognition, for to draft a report during the Forum and finalize it in the months thereafter is no simple matter. Finally, I extend my appreciation to April Benasich and Urs Ribary, whose commitment and congenial personalities were essential to this 25th Ernst Strüngmann Forum.

A communication process of this nature relies on institutional stability and an environment that encourages free thought. The generous support of the Ernst Strüngmann Foundation, established by Dr. Andreas and Dr. Thomas Strüngmann in honor of their father, enables the Ernst Strüngmann Forum to pursue its work in the service of science. In addition, valuable partnerships with the following groups are gratefully acknowledged: the Scientific Advisory Board, which ensures the scientific independence of the Forum; the German Science Foundation, for its supplemental financial support; and the Frankfurt Institute for Advanced Studies, which shares its intellectual setting with the Forum. Long-held views are never easy to put aside. Yet, when this is achieved, when the edges of the unknown begin to appear and the resulting gaps in knowledge are able to be identified, the act of formulating strategies to fill such gaps becomes a most invigorating activity. On behalf of everyone involved, I hope this volume will inspire future research focused on understanding the mechanisms by which the brain develops into a mature, fully functioning organ.

Julia R. Lupp, Director

Ernst Strüngmann Forum

Frankfurt Institute for Advanced Studies (FIAS)

Ruth-Moufang-Str. 1, 60438 Frankfurt am Main, Germany

<https://esforum.de/>