This Highlight Issue of Biological Chemistry publishes a wide selection of the results obtained within the research groups of the collaborative research centre Sonderforschungsbereich (SFB) 642 of the German Research Council (DFG). The SFB 642 contributed to a detailed understanding of GTP- and ATP-dependent signal transduction and transport processes at biological membranes at different scales. Single recombinant proteins up to complex protein-interaction networks in living cells have been studied. The complex, dynamic interplay between the proteins at membranes have been elucidated here with highest possible spatiotemporal resolution. The orchestration of expertise within the SFB 642 provided the unique opportunity to start with a detailed understanding of molecular reaction mechanisms and interactions of proteins in vitro in order to arrive at a thorough comprehension of how these processes are being integrated into the entire activity of the living cell. Determination of the three-dimensional structure of recombinant proteins in vitro is always a milestone in protein sciences, but the ultimate goal is the detailed understanding of the dynamic interplay of the proteins in vivo. As such a broad approach is a prerequisite to elucidate a biological issue of this complexity, a large consortium like the SFB was needed to succeed over different scales. Besides GTPases the structures and functions of membrane-bound ATPases, especially peroxisomal proteins, were also studied in great detail. These results are described in Schwerter et al. (2017), Bittner et al. (2017) and Reidick et al. (2017). The GTP- and ATP-dependent membrane processes were bridged by a central Project Z addressing proteome analysis, see the contribution by Lindemann et al. (2017). Mutations of the involved proteins can cause serious diseases. Thus, the issues addressed by SFB 642 provide a deeper understanding of these processes and contribute to precision medicine.

The principal investigators (Teilprojektleiter) of SFB 642 were recruited from the Ruhr-University Bochum, the Technical University Dortmund and the Max Planck Institute of Molecular Physiology in Dortmund. When it was established in 2004 SFB 642 was one of the first third-party financed consortiums within the later founded University Alliance Ruhr (UA Ruhr). In its 12-year funding period the consortium delivered 639 publications, 153 with impact factors above 9, and 174 common publications of which at least two PIs from different research groups of the SFB contributed. The generous €26.6 million funding of the DFG allowed us to promote a number of qualified young scientists. One hundred and nineteen graduate students performed their thesis within the SFB in an integrated research training group. Six younger PIs (Nachwuchsgruppenleiter) without permanent positions obtained tenure and became tenured Professors during the funding period at other universities.

SFB 642 has brought about structural changes at the Ruhr-University Bochum by being a precondition for the
PURE consortium (Protein Research Unit RUHR within Europe) founded in 2010. In addition to the PIs from SFB 642 clinicians are also integrated into PURE to ensure that the results and techniques developed in protein research in basic science at SFB 642 are translated into clinical applications. In 2014 PURE successfully acquired third-party funding from the German Science Council (Wissenschaftsrat) for a new research building called ProDi (molecular Protein-Diagnostics). ProDi will host 153 basic science researchers and clinical researchers under one roof from 2018 on. The mission is the development of innovative methods, especially label-free vibrational imaging in combination with proteomics, which will monitor protein alterations as biomarkers for an early, precise and predictive diagnosis of oncological and neurodegenerative diseases.

The SFB has set milestones at the Ruhr-University Bochum and the UA Ruhr in the last 12 years. We are very grateful to the DFG for their funding and especially their reviewers for their fruitful advice over the past 12 years. SFB 642 is an illustrative example how the DFG can catalyze excellent science within universities using the SFB program and thereby induce long lasting structural changes within universities to improve their international visibility. SFB 642 also advises the DFG in its support of the SFB program as it is an excellent initiative and thereby supports outstanding research within the universities going forward.

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**References**


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