

BIOLOGICAL CHEMISTRY

*Founded in 1877 by Felix Hoppe-Seyler as
Zeitschrift für Physiologische Chemie*

Felix Hoppe-Seyler (1825–1895) was a pioneer of biochemistry, remembered not only for his discovery of hemoglobin and his contributions to the chemical characterization of many other biological compounds and processes but also for having been the mentor of Friedrich Miescher and Albrecht Kossel. In his preface to the first issue of *Zeitschrift für Physiologische Chemie*, Felix Hoppe-Seyler coined the term *Biochemistry* ('Biochemie') for the then newly emerging discipline.



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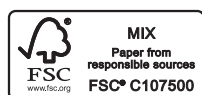
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COVER ILLUSTRATION

Biomolecules evolved to function inside living cells. However, protein function, structure and reactivity were so far mainly investigated in diluted aqueous buffer solutions. But can these results be readily translated into the cellular context? Commonly, artificial crowding agents were employed to mimic the cell and characterize the effects of crowding on the function and structure of proteins. In general, crowding is hypothesized to lead to compact structures and promote protein stability. In their Minireview on pp. 37-44 in this issue, Gnutt and Ebbinghaus discuss recent advances in the understanding of macromolecular crowding. The authors discuss the effects of the crowded cellular environment on protein stability and highlight how novel methods and crowding sensors allow to decipher the molecular basis of cellular crowding effects. Shown on the cover is a novel sensor that responds to changes in crowding. A random coil polymer was labelled with fluorescent dyes to measure the polymer size by fluorescence resonance energy transfer (FRET). If the sensor is placed into an environment with low available volume, a more compact structure (bottom panel) is found compared to diluted environments (top panel). The sensor is applied to study intracellular crowding differences between compartments and under severe osmotic stress.

Images courtesy of David Gnutt and Simon Ebbinghaus (Department of Physical Chemistry II, Ruhr-Universität Bochum, Germany), and Matthias Heyden (Max-Planck-Institut für Kohlenforschung, Mülheim an der Ruhr, Germany). The cover illustration is an adaption of a Figure from the article Gnutt et al., *Angew. Chem. Int. Ed.* 54 (2015), pp. 2548–2551, with permission from Wiley-VCH Verlag GmbH & Co. KGaA.



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