Preface
Lipidome and disease

Lipids were long believed to have two general functions: a structural role in biomembranes and an energy storage role utilizing cellular lipid droplets and plasma lipoproteins. The novel technology of lipid mass spectrometry has revealed that there are thousands of different lipids in the human body, with a multitude of different functions. Membrane lipids are involved in the maintenance of substructures in cellular membranes, the so-called lipid rafts. These domains are held responsible for sorting membrane proteins to their correct intracellular location, but also allow the entry of toxins, viruses and bacteria and have been associated with prion and Alzheimer's disease. In addition, a host of different lipids act as specific second messengers. Some lipids regulate intracellular membrane transport, other lipids regulate different physiological parameters such as the cell cycle.

It is therefore not surprising that there are many disease states associated with a defective balance of lipids. In a number of cases this is due to aberrations in the responsible enzymes or transporters, as a number of papers in the present special issue illustrate. Whereas in some cases the molecular mechanism of the disease is understood, in other cases the link between the molecular defect and the disease pathology is less clear. However, even in the latter cases basic knowledge of the underlying defect can help to devise strategies for diagnosis and treatment. Finally, various papers describe the effect of the revolutionary developments of novel technology in lipidomics, particularly mass spectrometry, on the diagnosis, monitoring and therapy of lipidome-related disorders.

This special issue accompanies the FEBS special meeting "New Concepts in Lipidology: from Lipidomics to Disease" jointly sponsored by the European Lipidomics Initiative. Besides the organization of science-related as well as policy meetings, this initiative (www.lipidomics.net) seeks to network the field of metabolomics, link it to genomics and proteomics, to define a research strategy using lipidomics as an example and create a Lipidomics Expertise Platform (www.lipidomics-expertise.de).

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