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# Systems Biology of Lipids Metabolism

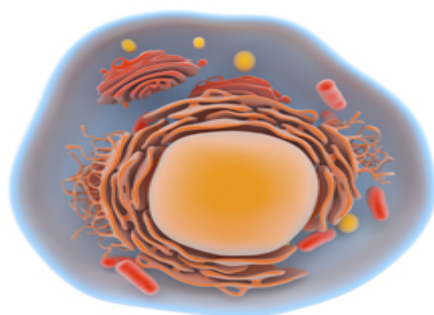
## Results in Brief

### Sphingolipids — understanding structure and function

Sphingolipids are integral in maintaining our cell membrane structure and regulating metabolism and other key functions. Lipid deregulation can cause diseases such as diabetes, obesity, hypertension and Alzheimer's disease.



HEALTH



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The EU-funded 'Systems biology of lipids metabolism' (SBLIME) project was initiated to characterise and investigate the molecular mechanisms of sphingolipids. Researchers employed a systems biology approach along with high-resolution chromatography and mass spectrometry for the analysis of global and lipid metabolism as well as biosynthesis pathways.

SBLIME scientists successfully developed a yeast kinetic model of sphingolipid metabolism using biochemical, metabolomic and lipidomic data. The kinetics of each reaction and enzyme saturation were accurately described. The model could successfully reproduce lipid distributions in static and dynamic conditions. Further studies could reveal interactions between system components.

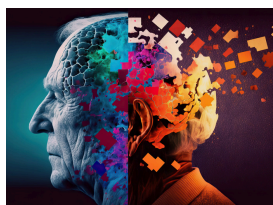
Several sensitivity analysis techniques were compared for applicability to the

sphingolipid model as well as any model based on the System Biology Markup Language (SBML). SBML will end up as the new benchmark for describing biological systems, and project members intended to create a versatile and modular tool for analysis.

Scientists comprehensively analysed steady-state concentrations and fluxes using the selected sensitivity analysis tools. Results revealed key parameters involved in lipid pathway function as well as distribution.

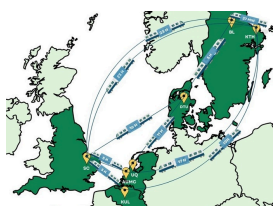
Project outcomes have laid the groundwork for further studies on mechanisms of lipid metabolism, interactions and function with important implications for medicine. Techniques developed within this study could also be adapted by other research groups in the biotechnology sector.

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### Project Information

#### SBLIME

Grant agreement ID: 249205

Project closed

#### Start date

1 November 2009

#### End date

31 October 2012

#### Funded under

Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

#### Total cost

€ 45 000,00

#### EU contribution

€ 45 000,00

#### Coordinated by

ECOLE POLYTECHNIQUE  
FEDERALE DE LAUSANNE



Switzerland

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