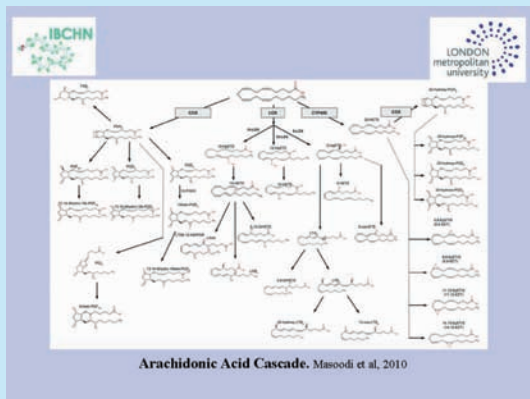
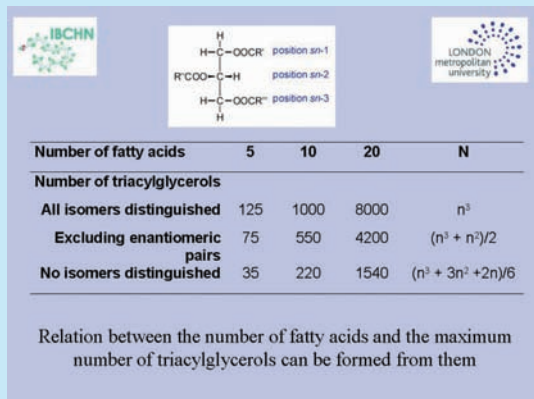
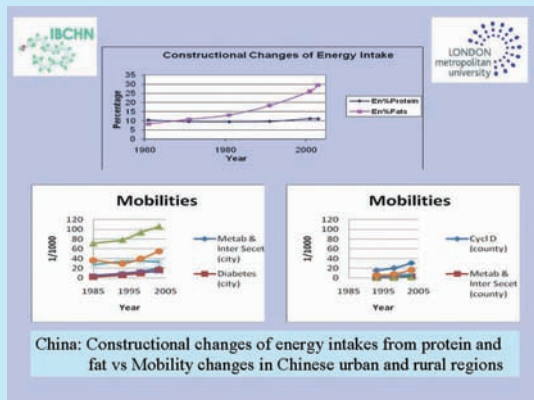
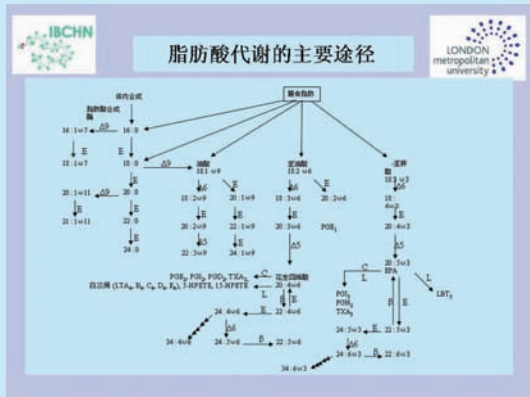
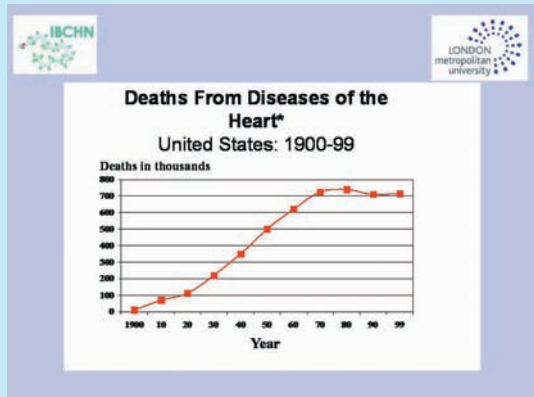
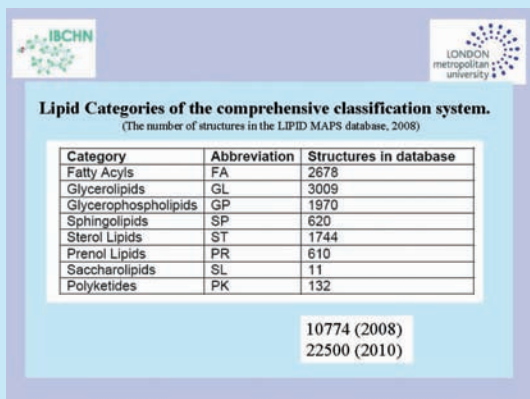
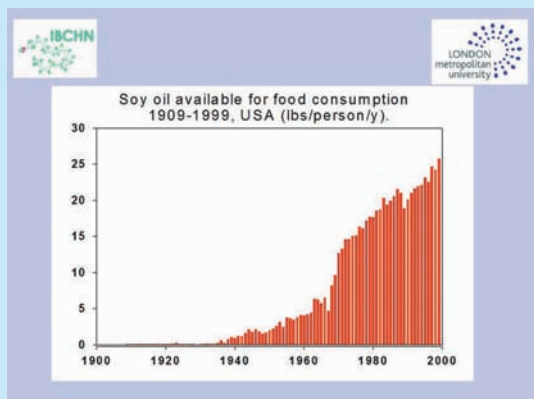




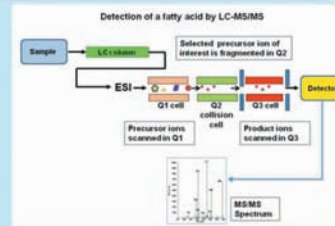


Definition

Lipidomics is defined as the systematic study of lipid molecules and their function in biological systems.

The analysis of lipids on the systems-level scale together with their interacting factors.

The full characterization of lipid molecular species and of their biological roles with respect to expression of proteins involved in lipid metabolism and function, including gene regulation.



Schema showing detection of a fatty acid by LC-MS/MS using a linear ion-trap instrument and an electrospray (ESI) ion source



Lipidomics

Main works:

- * Analyzing the individual lipid molecular species and their metabolites;
- * Studying the individual lipid's functions and metabolic regulations;
- * Mapping the metabolic and interactive ways and nets of lipids.



Main data sources of Lipidomics



Lipidomics

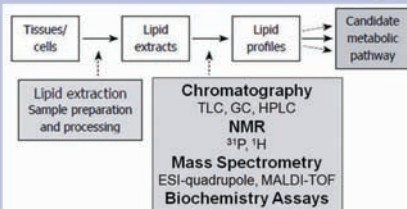
Computational lipidomics	Eicosanomics
Oxidative lipidomics	Phospholipidomics
Neurolipidomics	Sphingolipidomics
Endocannabinoidomics	Glycolipidomics
Targeted lipidomics	Steroidomics
Mediator lipidomics	etc
Functional lipidomics	



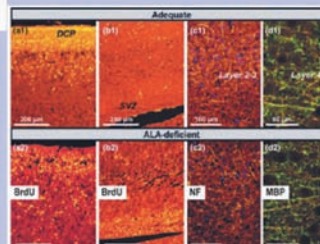
Human plasma lipid diversity



Quehenberger O, et al. 2010



Lipidomics work flow – lipid extraction and analysis.



Cross-sections of the parietal cortex from postnatal pups stained with BrdU (a, b) neurofilament (NF, c) and myelin basic protein (MBP, d).

Brand A, Crawford M, Yavin E. (2010) J. Neurochem. 114, 1393-1404

IBCHN

Class of lipidmodified proteins.

LONDON metropolitan university

Extracellular space

Phospholipid bilayer

Cytosol

RECK-Cys

GPI

Myristoylation

N-myristoyltransferase

Palmitoylation

Cys-Palmitoylation

Myristoylation

Gly-Myristoylation

Hedgehog

Gly-Hedgehog

Cholesterol

Gly-Cholesterol

Ras

Cys-Ras

Farnesylation

Gly-Farnesylation

Geranylgeranylation

Gly-Geranylgeranylation

Ferri N, et al. Biomarkers, 2005



Instruments in IBCHN





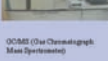
QDMS (Quartz Chromatograph Mass Spectrometer)



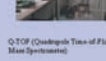
QTOF (Quadrupole Time of Flight Mass Spectrometer)



GC-OTC-IR-ME2 (Gas Chromatograph-Organic Thin Layer Chromatography-Infra Red-Mass Spectrometer)



ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometer)



MALDI-TOF (Matrix Assisted-Laser Desorption/Ionisation Time of Flight Mass Spectrometer)



300 MHz NMR (300 MHz Magnet)



Summary

- Lipidomics is revolutionizing the approach to the analysis and understand of lipids.
- The scientists are exploring the importance of individual molecular species of specific lipid classes in living systems.

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THANKS!

谢谢!