

“Introduction and Overview”

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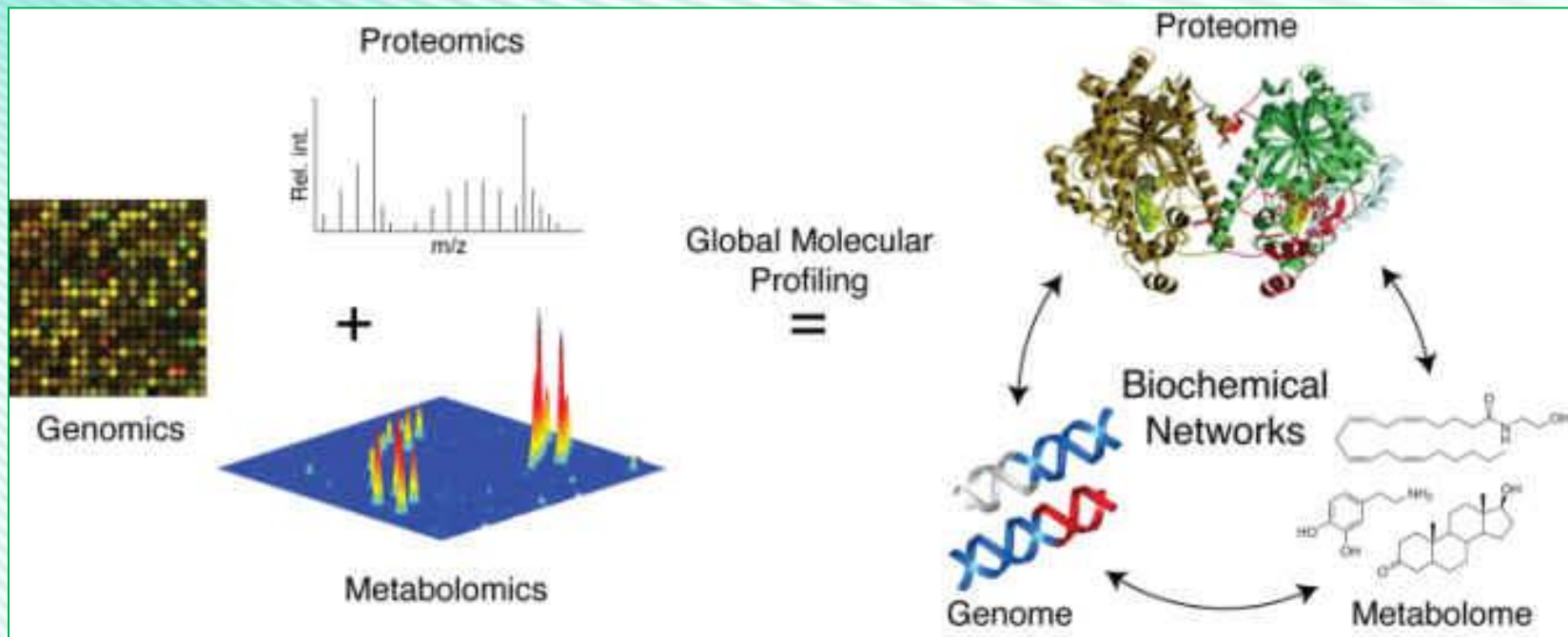
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Systems Biology and Metabolomics

“the systematic study of the unique chemical fingerprints that specific cellular processes leave behind”

Holistic Analysis of small molecules



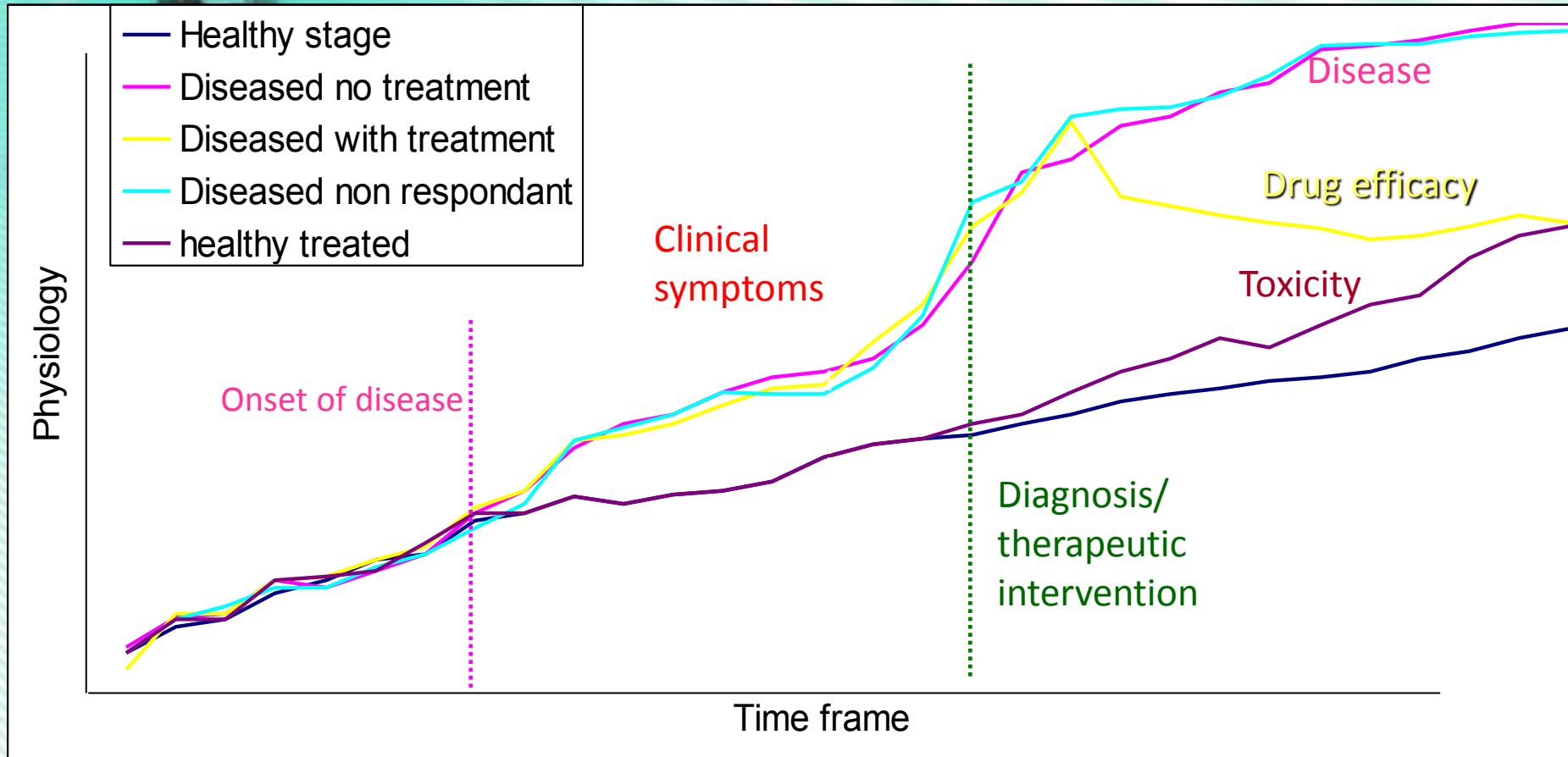
Perspective

- Metabolites downstream the biochemical pathway compared to genes, proteins, closer to phenotype
- Can describe effects of xenobiotics (e.g. pharmaceuticals) and host-guest interactions (e.g. mammals with gut microflora)
- Describes ongoing phenomena

What do metabolomics offer ?

Bio-Markers

Biochemistry insight



Potential for the discovery of biomarkers

Additional knowledge of the biochemical pathways

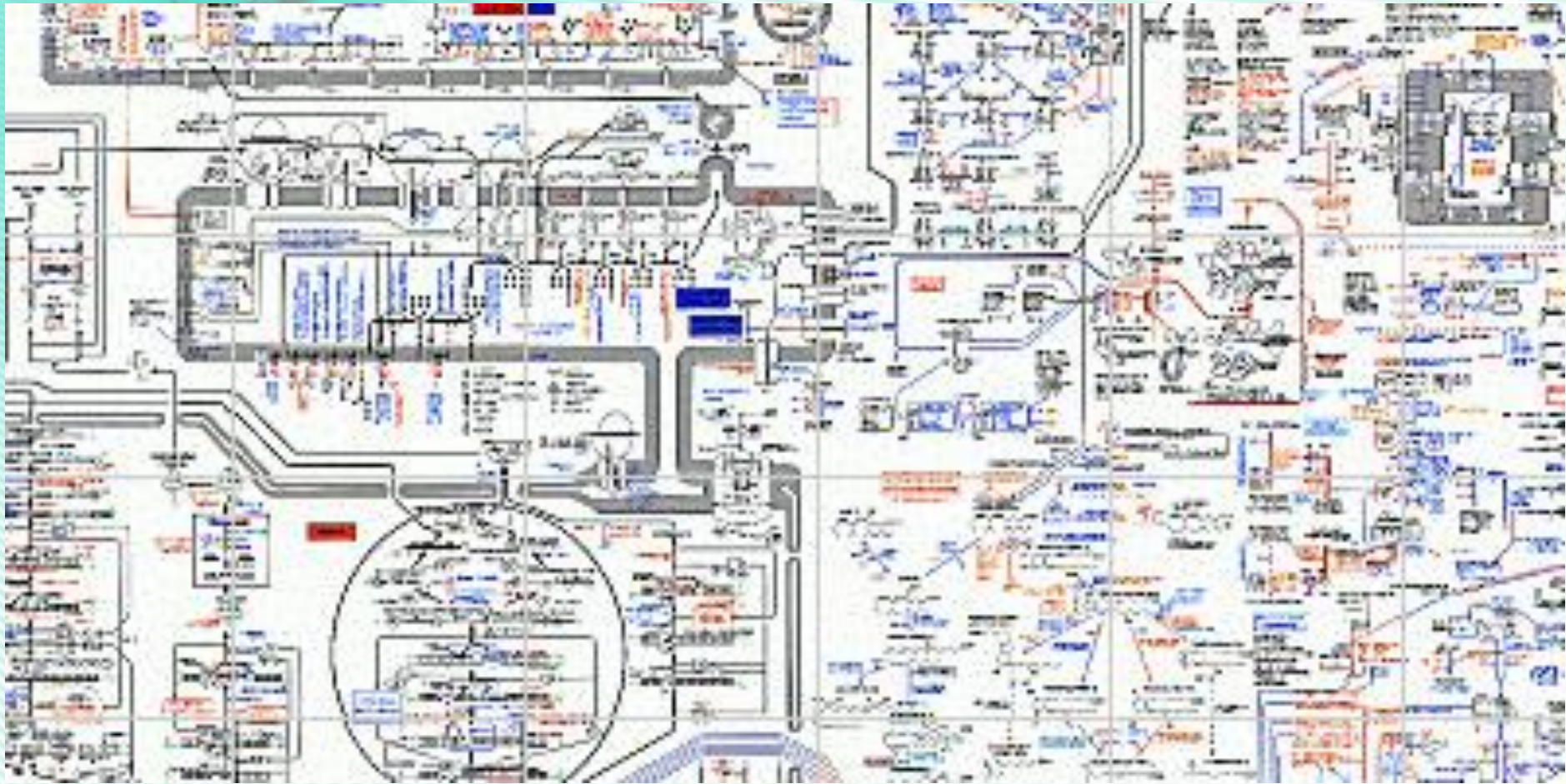


Plants/Food

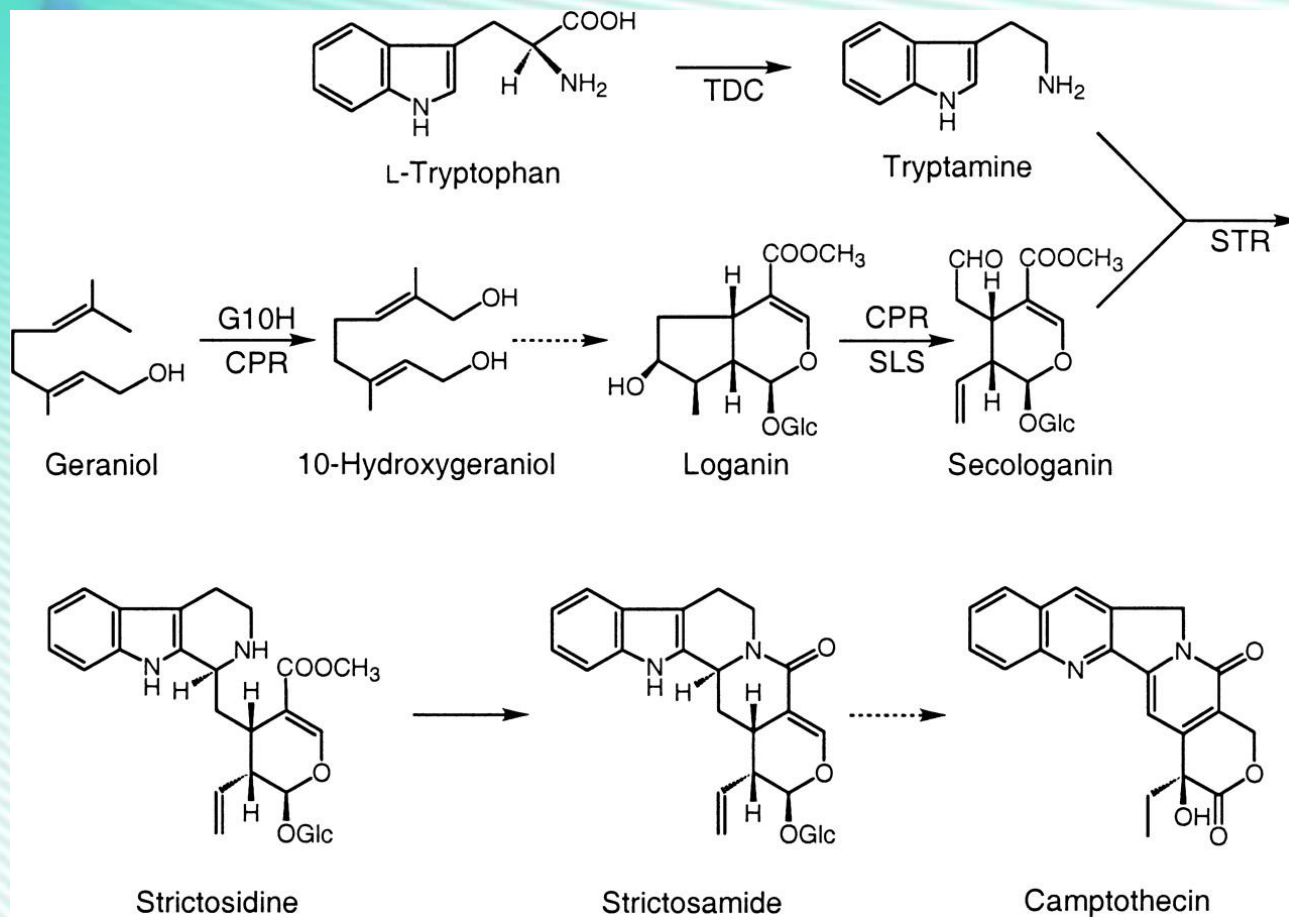
- Metabolomics can shed light in biochemistry
- Can speed biotechnology processes e.g. plant hybridization
- Potential in authenticity-geographical origin control
- Small molecules comprise a large part of the total organic content of foods e.g. wine and honey, and their properties, organoleptic characteristics/nutritional value and so forth.

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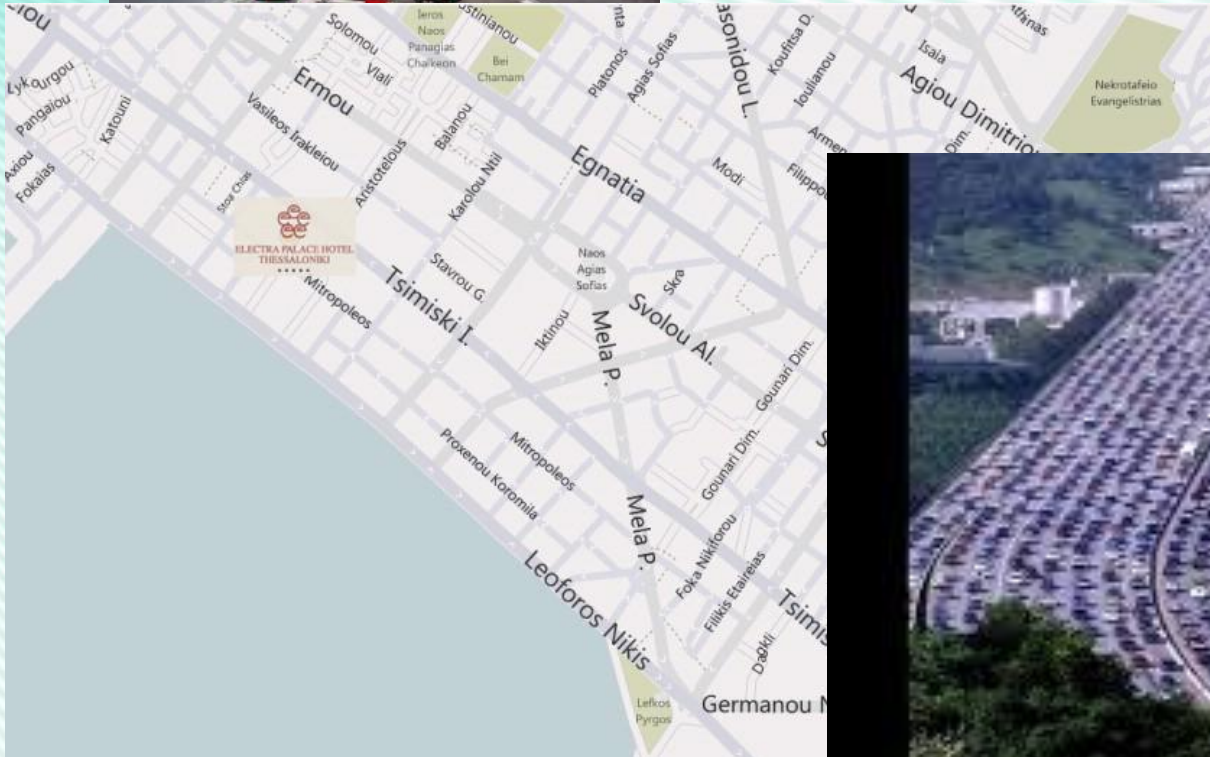
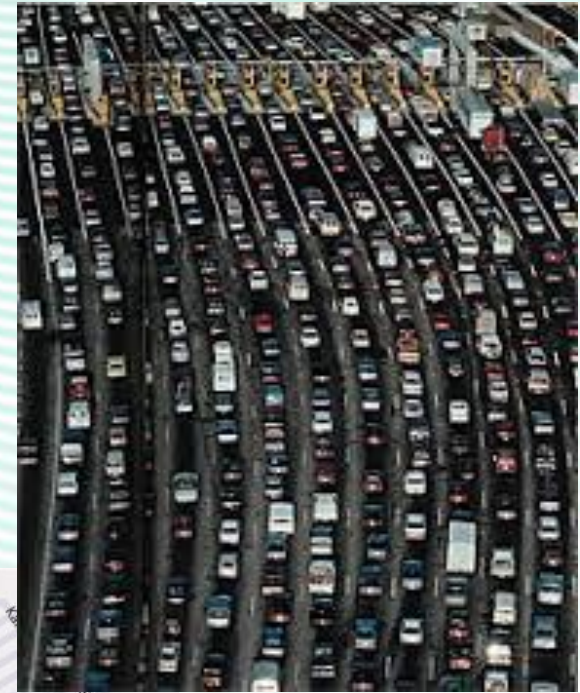
Biochemical Pathways



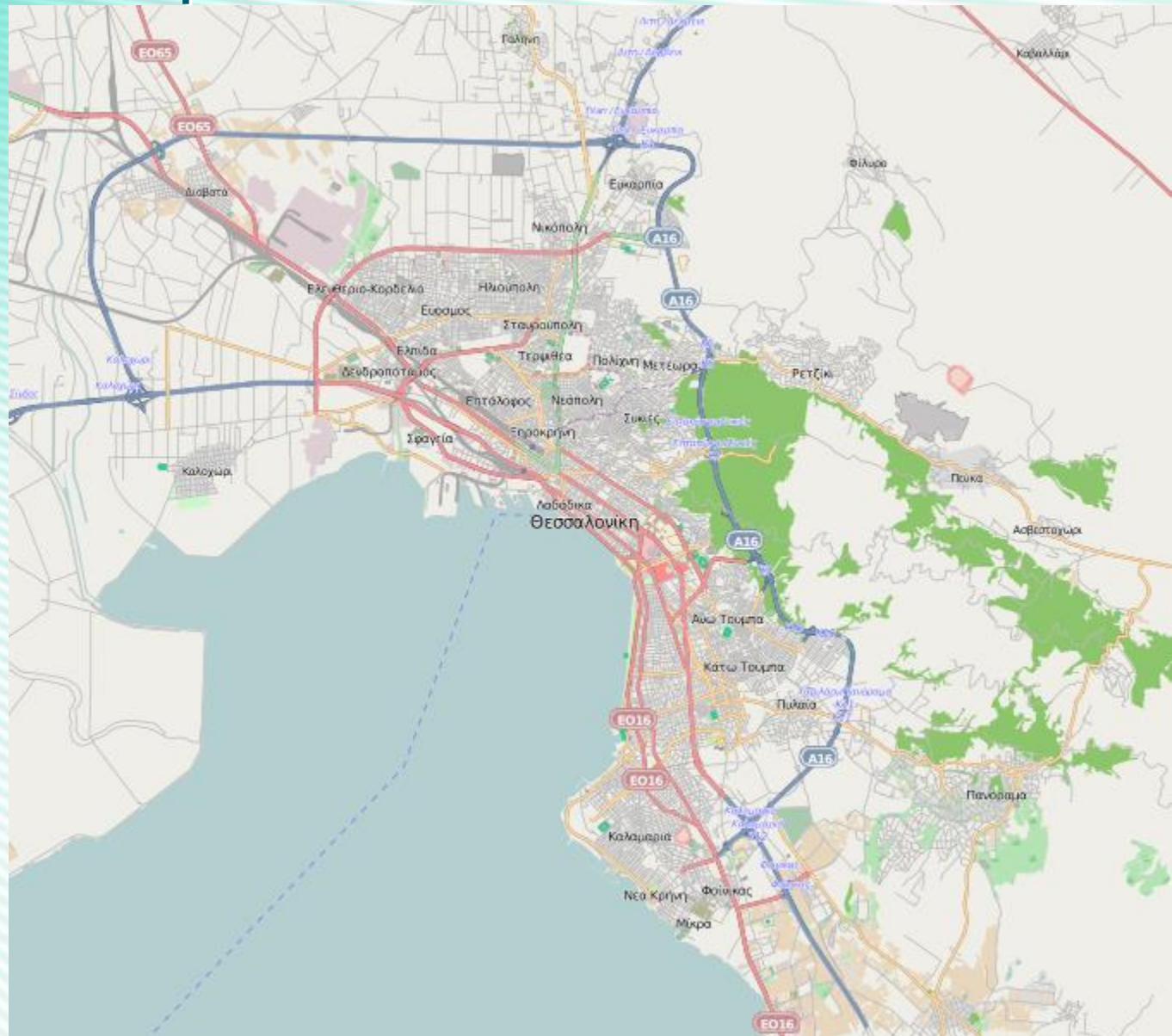
Tryptophan path in plant

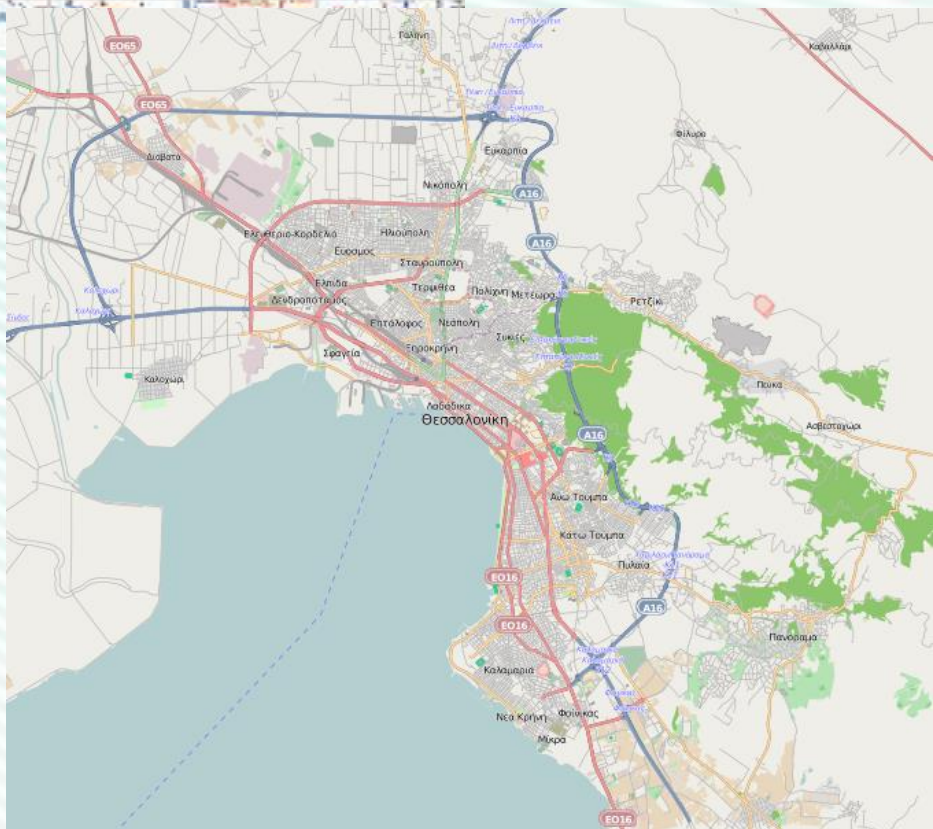
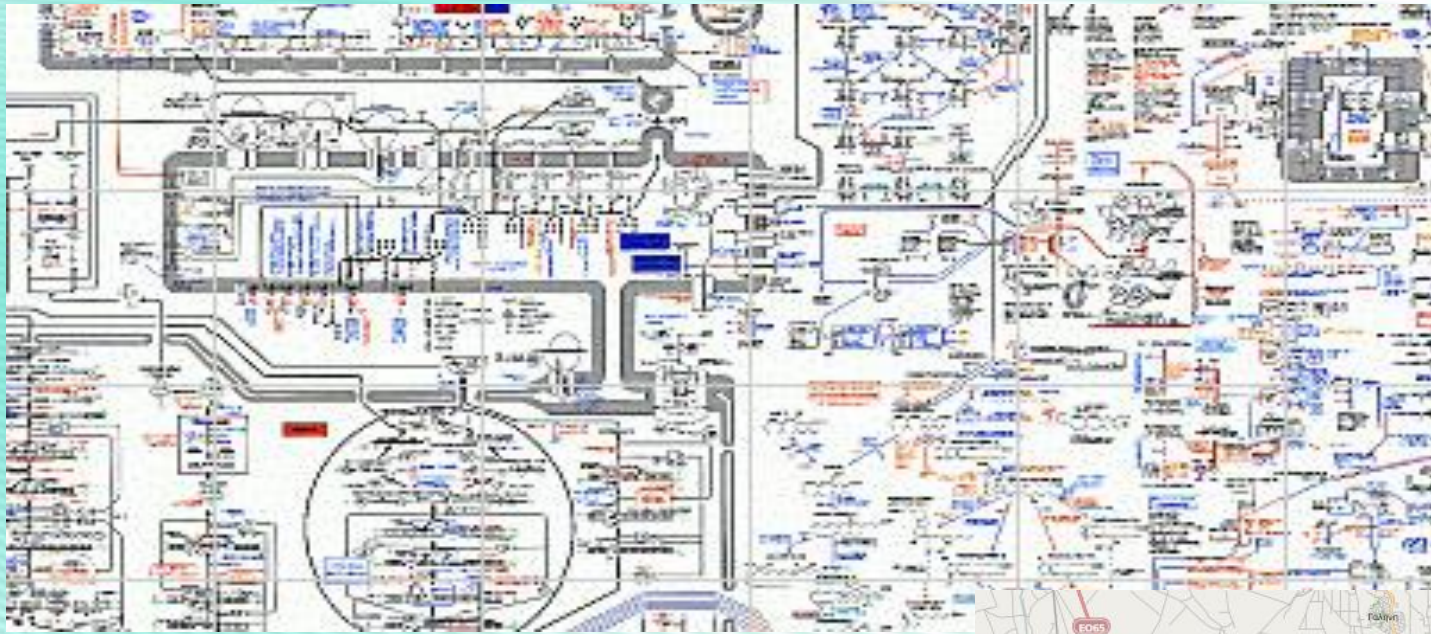


Congestion

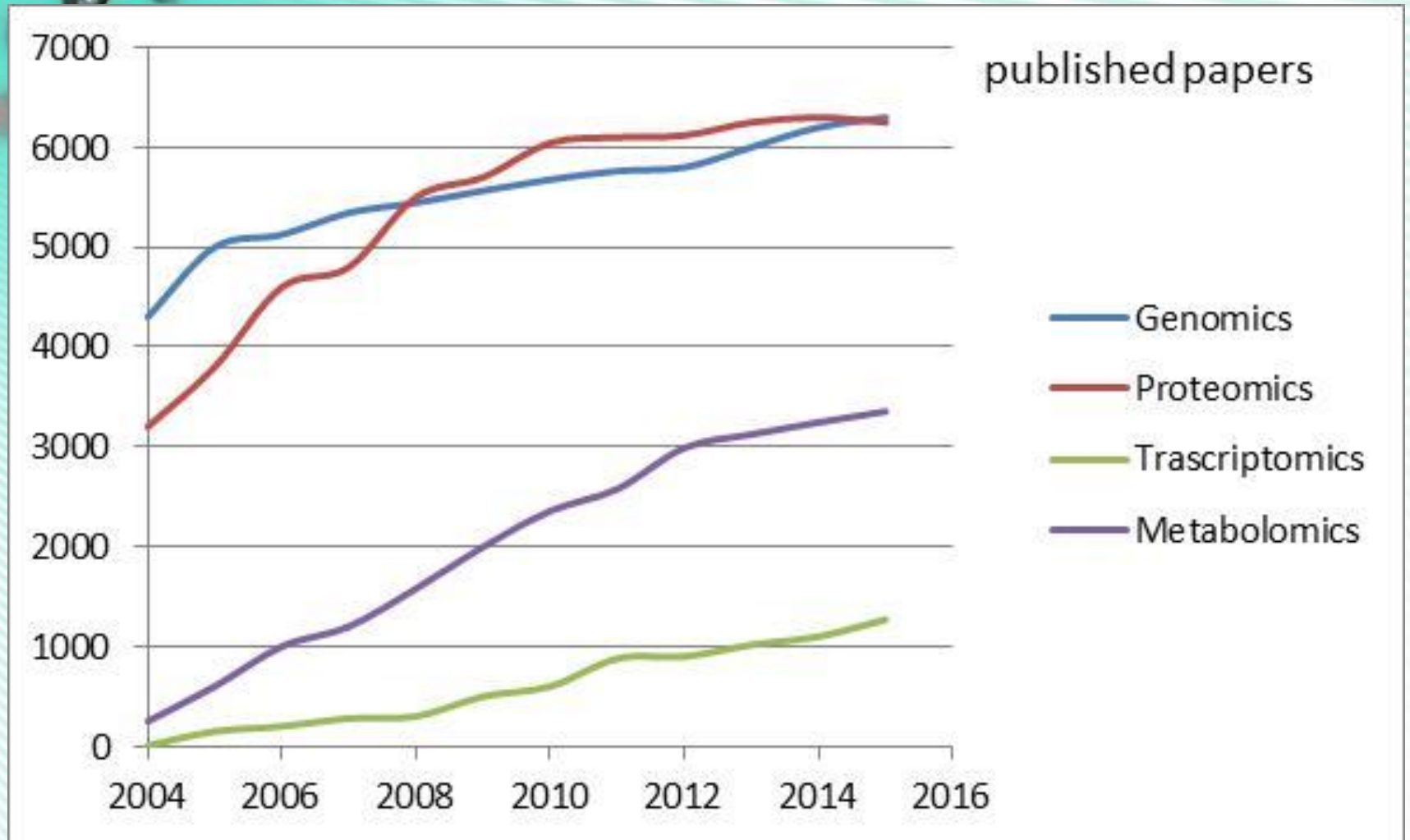


Holistic Perspective





An expanding field



What we do

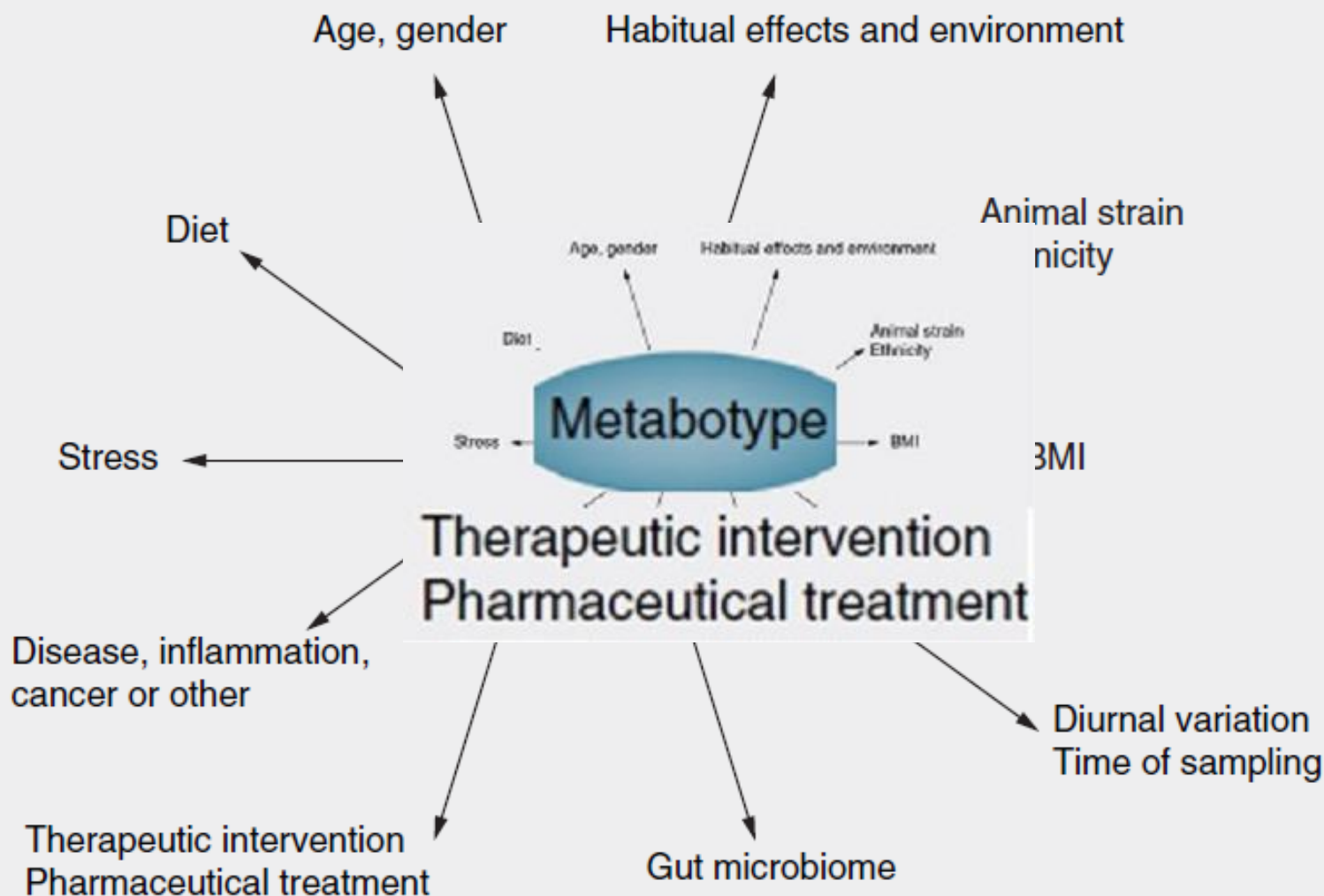
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- Publish in 153 journals
 - > 8500 publications
 - Patents 791 hits in USPTO
 - >3 annual Conferences



Problems

- Analytical Chemists, Informaticians/Chemometricians, Biochemists still speak different language
- Fragmentation of research. Several labs do the same job e.g. spent weeks to identify the same unknown molecules
- Genomics labs can split tasks /Metabolomics labs can't
- Standardisation/COST proposal to be submitted

Figure 1.1. The interplay between different factors and the metabolic content revealed by metabolomics.



Source: *Considerations in the design of clinical and epidemiological metabolic phenotyping studies*
G Theodoridis et al 2013, ebook *Metabolic profiling in clinical applications*. doi:10.4155/EBO.13.487



Workshop Program

- Fundamentals
- Health Sciences
- Food/Nutrition

- Seminars are for question/answer
- Metabolites Special Issue

Helen Gika Guest Editor



Our workshop

- Start 2008 in Thessaloniki
- 2nd Athens, 2012
- 3rd Patras 2014

Present Meeting

- >120 participants
- >28 Institutions
- >14 Countries



Thanks to

Auth group

Speakers/Poster Presenter

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