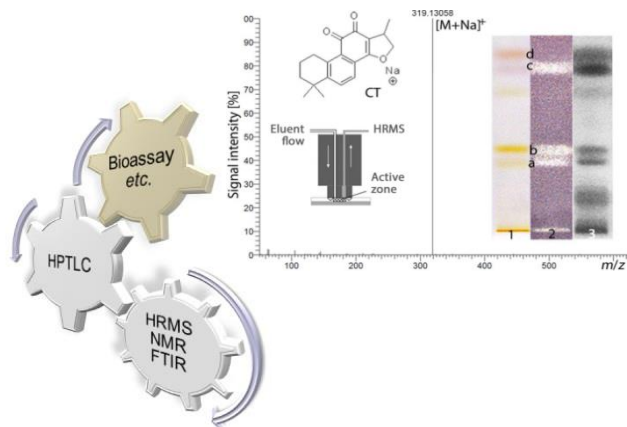




## Hybrid Modul Hyphenated HPTLC

Prof. Dr. Gertrud Morlock

- Chromatography combined with assays
- Pointing to single bioactive compounds in complex samples
- Streamlined profiling via biological and biochemical assays in the adsorbent bed
- High-performance thin-layer chromatography combined with effect-directed assays and high-resolution mass spectrometry (HPTLC-UV/Vis/FLD-EDA-HRMS)



### PROGRAM

Digitally via Link:  
MON 27.02. – FRI 03.03.2023  
09.00 – 16.00 Theory each day

At JLU Giessen:  
On agreement, 1 or 2 day(s) for Lab demonstration  
Start/End depending on arrival/departure

We recommend as the closest hotel to our place:  
<https://restaurant-heyiligenstaedt.de/boutique-hotel>

### REGISTRATION/CERTIFICATE

Email to [gertrud.morlock@uni-giessen.de](mailto:gertrud.morlock@uni-giessen.de)

Hybrid Module costs: 1800 Euro/person

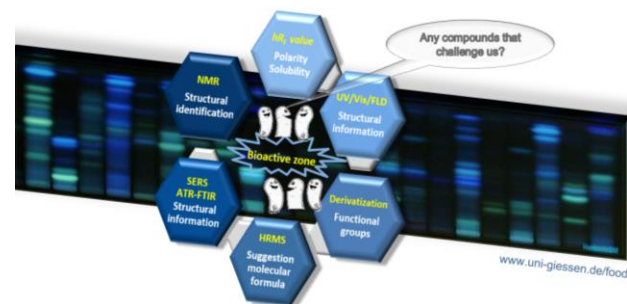
### CONTENTS

- Antimicrobials via Gram-negative *Aliivibrio fischeri* bioassay
- Antimicrobials via Gram-positive *Bacillus subtilis* bioassay
- Genotoxic compounds via SOS-Umu-C assay
- Hormone-effective compounds via planar yeast estrogen/androgen screen (pYES/pYAS)
- Agonistic and antagonistic effect detection (pYAES/pYAAS)
- Enzym inhibitors via  $\alpha$ - and  $\beta$ -glucosidase,  $\alpha$ -amylase, acetyl and butyryl cholinesterase, tyrosinase and  $\beta$ -glucuronidase assays
- On-surface simulated digestive system: nanoGIT<sup>active</sup>
- On-surface metabolization by the S9 enzym system
- Adhesive/adherent cell assays on-surface
- Coupling to ESI-HRMS or DART-MS

### RESPONSIBLE FOR MODULE



Justus Liebig University Giessen  
Prof. Dr. Gertrud Morlock  
Full Professor  
Chair of Food Science  
[www.uni-giessen.de/food](http://www.uni-giessen.de/food)

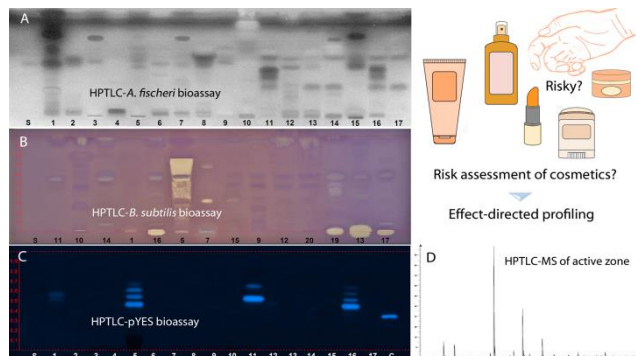


### MODULE AIMS

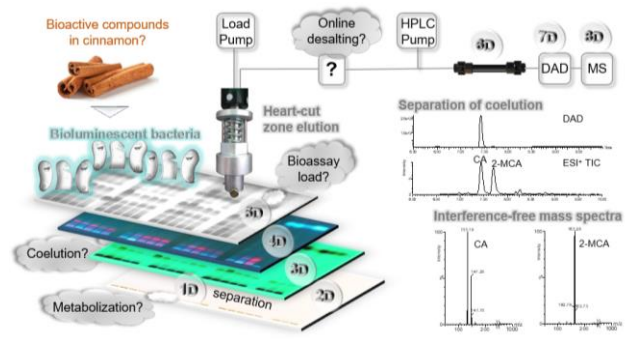
The participants

- Understand the meaning of effect-directed analysis as well as advantages and disadvantages of the different techniques
- Survey the variety of on-surface or *in situ* assays (in the adsorbent bed)
- Know the streamlined workflow on one plate, *i. e.* parallel separation of compounds in complex samples, discovery of active compounds and their characterization by chromatographic, spectroscopic and spectrometric information (3-20 min/sample for up to 20 samples in parallel)
- Recognize the highly efficient combination of planar chromatography with biological and biochemical or other effect-directed assays
- Realize the power of hyphenated HPTLC and can benchmark effect-directed profilings

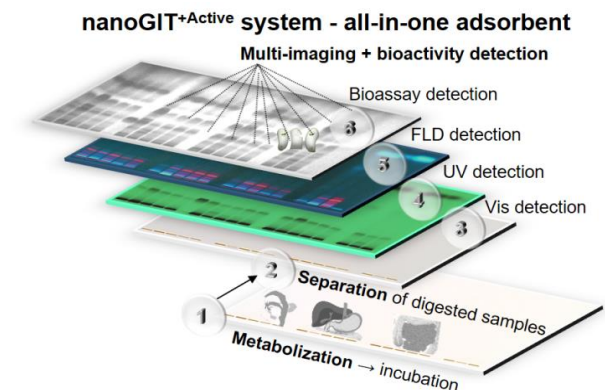
## EFFECT-DIRECTED PROFILING OF COSMETICS



## DIRECT RECORDING OF HRMS SPECTRA



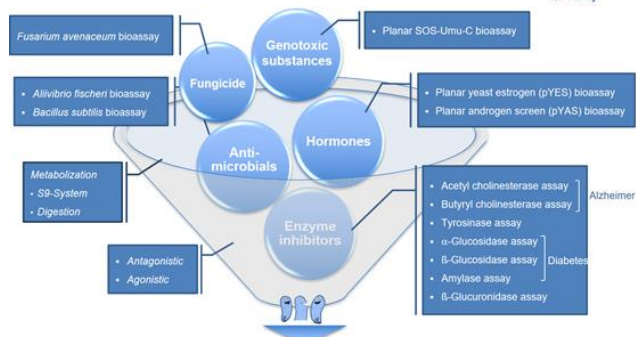
## ON SURFACE SIMULATED DIGESTIVE SYSTEM



## EXAMPLES OF ASSAYS IN USE

### Giving answers to what matters

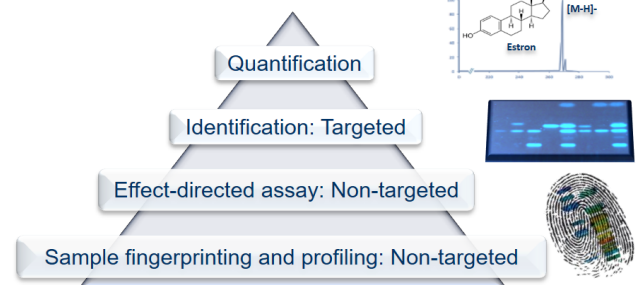
Far better an approximate answer to the right question, than an exact answer to the wrong.  
J. Tukey



>20 000 compounds reduced to few important ones

Morlock, G., q-more.chemie.de

## EFFECTIVE SYSTEM



### HPTLC-UV/Vis/FLD-assay-HRMS

- Fast profiling of samples in parallel
- Samples remain as native as possible
- Sample preparation is kept minimalistic
- View on sample is comprehensive
- Pointing to single active compounds
- Molecular formulae of active substances
- Data storage is minimalistic

Morlock, G., q-more.chemie.de

## LOCATION



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The working place of Justus Liebig:



Source: wikipedia.org