

N.B. : l'essentiel de cette contribution est confidentiel  
et sera mis en ligne lorsque publié  
merci pour votre patience

## Why important effects in samples are overlooked and how planar bioassays can help



G. Morlock, JLU Giessen, Germany

# Links



## A bioimaging system combining human cultured reporter cells and planar chromatography to identify novel bioactive molecules



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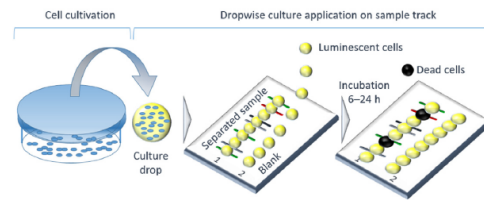
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<sup>b</sup> BioDetection Systems B.V., Science Park 406, 1098, XH Amsterdam, the Netherlands

### HIGHLIGHTS

- First on-surface adherent cell assays were demonstrated.
- Adherent human cells grow on planar chromatogram with separated samples.
- Human cells used as a biotector for cytotoxic substances on HPTLC plates.
- Non-target screening of cytotoxic substances in natural samples.
- Activation of the PPAR $\gamma$  receptor in human adherent cells on HPTLC plates.

### GRAPHICAL ABSTRACT



### 2023

220. Nikolaichuk, H., Choma, I. *Morlock, G.E.*: Effect-Directed Profiling of *Akebia quinata* and *Clitoria ternatea* via High-Performance Thin-Layer Chromatography, Planar Assays and High-Resolution Mass Spectrometry, in submission
219. Müller, I., *Morlock, G.E.*: Quantitative saccharide release of hydrothermally treated flours by validated salivary/pancreatic on-surface amylolysis (nanoGIT) and high-performance thin-layer chromatography, in submission
218. Inarejos-Garcia, A.M., Heil, J., Martorell, P., Álvarez Pérez, B., Llopis Pla, S., Helbig, I., Liu, J., Quebbeman, B., Nemeth, T., Holmgren, D., *Morlock, G.E.*: Effect-directed, chemical and taxonomic profiling of peppermint proprietary varieties and corresponding leaf extracts, antioxidants 12 (2023) 476, [free download](#)
217. Meyer, D., *Morlock, G.E.*: HPTLC analysis of industrial bamboo tableware for genotoxins, melamine and formaldehyde, J Planar Chromatogr 36 (2023) in print
216. Nikolaichuk, H., Choma, I. *Morlock, G.E.*: Bioactivity Profiles on 13 Different Effect Mechanisms for 15 Golden Root Products Via High-Performance Thin-Layer Chromatography, Planar Assays and High-Resolution Mass Spectrometry, molecules 28 (2023) 1535, [free download](#)
215. Mügge, F.L.B., *Morlock, G.E.*: Chemical and cytotoxicity profiles of 11 pink pepper (*Schinus spp.*) samples via non-targeted hyphenated high-performance thin-layer chromatography, in submission
214. Meyer, D., Marin-Kuan, M., Latado, H., Schilter, B., *Morlock, G.E.*: Planar 6-fold multiplex bioassay to differentiate endocrine agonist, antagonist, false positive antagonist, cytotoxin, anti-cytotoxin, and false positive anti-cytotoxin, in submission
213. Mehl, A., Seiferling, S., *Morlock, G.E.*: Non-Target Planar Estrogenic Screening of 60 Pesticides, 6 Plant Protection Products, and Tomato, Grape and Wine Samples, Anal Bioanal Chem, in print
212. Mehl, A., *Morlock, G.E.* Strong antibacterial effects in animal-derived food detected via non-target planar bioassays, in submission
211. Schreiner, T., *Morlock, G.E.*: Investigation of the estrogenic potential of 15 rosé, white and red wines via effect-directed ten-dimensional hyphenation, J. Chromatogr. A 1690 (2023) 463775, [free download](#)
210. Schreiner, T., Eggerstorfer, N., *Morlock, G.E.*: Effects of Gastrointestinal Digestion on Bioactivity of Convenience Tomato Products Studied by Ten-Dimensional Hyphenation, in submission
209. Bauer, M.; *Morlock, G.E.*: Nutrition behavior of adult students and teachers at German vocational training centres linked with school kiosk offering, in submission
208. Kruse. S., Becker. S., Pierre. F., *Morlock, G.E.*: Metabolic profiling of bacterial co-cultures reveals intermicrobiome interactions

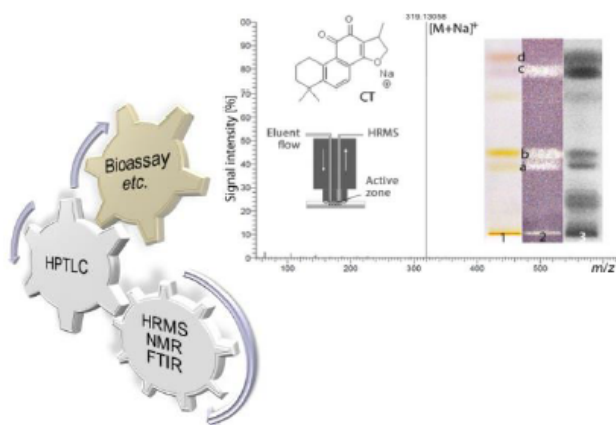
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## Hybrid Modul Hyphenated HPTLC

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)



**SAFETY    AUTHENTICITY    RISK ASSESSMENT**

### PROGRAM

Digitally via Link: ↓  
 MON 26.02. – FRI 01.03.2024  
 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-heylingenstaedt.de/boutique-hotel>

### REGISTRATION/CERTIFICATE

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

Hybrid Module costs: 1800 Euro/person

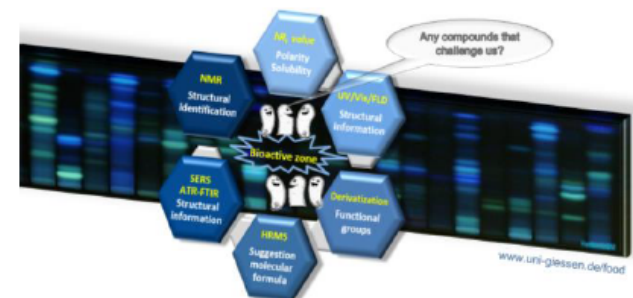
### CONTENTS

- 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)
- Enzyme 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 metabolism by the S9 enzyme 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

# Premiere

# Do-It-Yourself workshop

## 2LabsToGo Workshop



Limited to 20 scientists

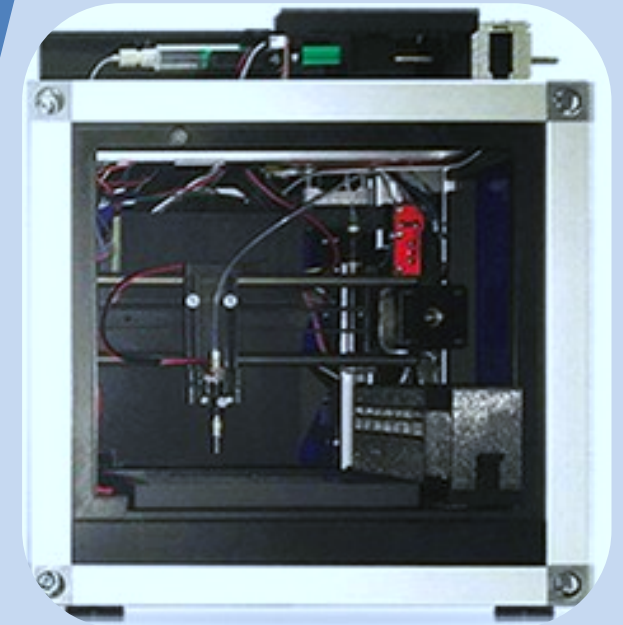
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at materials cost price, advance payment (ca. 3500 Euro)



- Assembly of the system, Tuesday 13:00 to Thursday
- Applications, Friday
- Troubleshooting, Saturday 13:00 end



**Build your own 2LabsToGo system to carry home**



03.-07.09.2024 (week before HPTLC 2024)



JLU Giessen, Heinrich-Buff-Ring 19, new Chemistry lecture hall, room C103, 35392 Giessen, Germany



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Thank you!