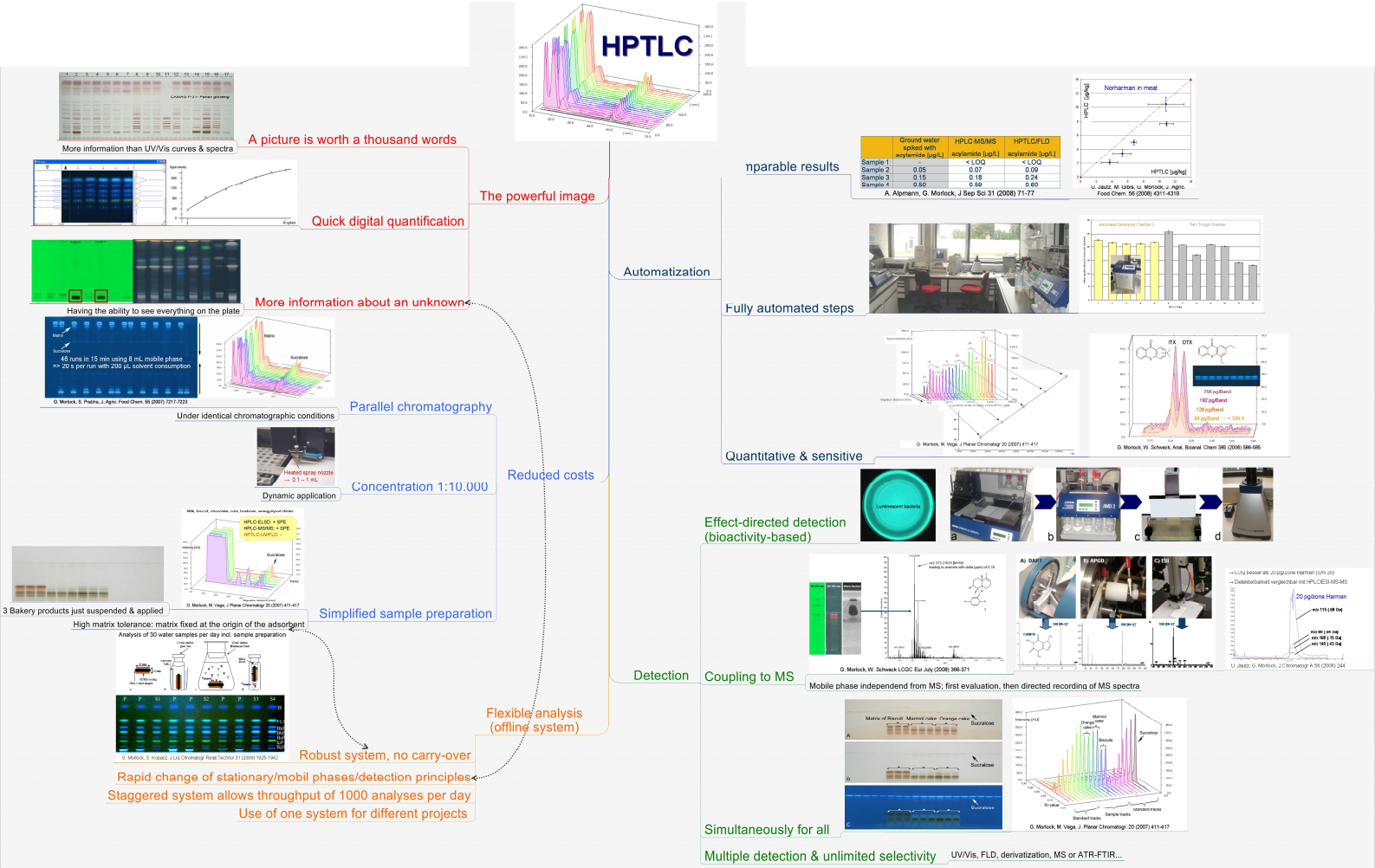
70 years of planar chromatography – the planar format still offers unrivalled features

Morlock, G. and Schwack, W.

Institute of Food Chemistry, University of Hohenheim

Introduction

Planar chromatography dates back to the year 1938 when, N. A. Izmailov and M. S. Shraiber at the Pharmaceutical Institute in Kharkov (Ukraine) first made a circular thin-layer chromatogram. It is impressive all the more to recognize that the thin-layer chromatographic technique (TLC) had developed into a high performance method (HPTLC) that can keep pace, referred to rapidness, with the ultra-rapid HPLC separations of today. It can contribute to cost-effective analysis when HPTLC solves challenging questions in a simple way.



Conclusions

Planar chromatography enables parallel chromatography (bandwise up to 46 runs at one go) under identical chromatographic conditions. Since the application volume can be kept flexible (100 nL to 1 mL) and the plate is discarded after the analysis, the clean-up step is less exhaustive in comparison with HPLC and GC, even not necessary. Reproducible chromatograms are nowadays ensured by intelligent automated developing chambers including the control of the plate activity. The multiple detection by UV/Vis and FLD as well as the ease and flexibility of performing in situ pre- or post-chromatographic derivatization (simultaneously for all runs) strengthens the position of HPTLC as a particular chromatographic technique. This also contributes to the beautiful images obtained in HPTLC which offer and visualize analysts information at a glance.

In various fields of analysis, activity-based or effect-directed detection is a more comprehensive detection approach. All substances which are generating a distinct effect are detected in complex mixtures down to the picomol range. Meaning bioactive compounds including also unknown metabolites, contaminants, or degradation products are detected for example in waste water, forensic, cosmetic, consumable or natural product samples. This approach is quite different from target analysis generally used. It can ideally be directly combined with mass spectrometry to enable the identification of single biological active compounds. This is an extremely powerful new approach for bioactive or functional compounds because so far, these substances were detected by tedious isolation of single substances followed by the respective bioassay. All these features are unrivalled because they are offered just by the planar format.

To reach the water source, you have to swim against mainstream.
Konfuzius