

## Screening for the Unknown



Claudia Nachbur  
Sales & Marketing

Dear reader,

The principle of effect-directed analysis is attracting growing interest in connection with fast toxicity screening for food and environment-related applications. In view of the enormous number of possible substances and their degradation products, risk evaluation based on target analysis often makes little sense. Effect-directed analysis offers the additional advantage of capturing unknown substances as well as substances that are not actively being sought.

But effect-directed HPTLC analysis is not restricted to bioluminescent bacteria. Its suitability has also been proven for other types of bioassays such as acetylcholinesterase inhibition, penicillin and *B. subtilis*, as well as for genotoxicity tests such as the umu and yeast estrogen screen (YES) tests.

The combination of HPTLC with bioassays offers many advantages that also come with the use of thin-layer chromatography: it is fast, robust and affordable. Image analysis facilitates quantitative recording of the inhibition process. And because HPTLC can now be combined with MS online, further analysis of the zones of interest is also possible.

Potential applications for effect-directed analysis are toxicity screening for environmental and food-related applications, in the risk assessment and monitoring of drinking water, wastewater and natural attenuation processes, and in the identification of biological activity in natural product extracts.

## News & Events

- Arab Lab 2007, Dubai, 11–14 Feb 2007, Booth # 137 (BDH)
- Pittcon 2007, Chicago/USA, 26 Feb–1 March 2007, Booth # 4842
- LAB Africa, Johannesburg/RSA, 14–16 March 2007, Stand # 64 (Swisslab)

# CAMAG

January 2007

## Selective detection of bioactive compounds

**BioLuminizer is a new detection system from CAMAG developed specifically to detect bioluminescence on HPTLC plates**

Thanks to a top-quality, high-resolution cooled CCD camera, BioLuminizer guarantees excellent image quality. Compact in design, the instrument is easy to use and clean, and is the first dedicated imaging system available for bioluminescent based effect-directed analysis.

Effect-directed analysis combining HPTLC with bioassays is a viable alternative to complex target analysis and provides a fast, low-cost means of demonstrating biological activity. The time and effort required to examine structures or isolate substances can be restricted to a few relevant substances. By using HPTLC to separate the test sample into individual substances, the possibility of the antagonistic or synergistic effects that occur with cuvette tests can be eliminated.

The principle on which the HPTLC/bioluminescence test is based is as follows: the complex sample is separated using HPTLC and the plate subsequently immersed in the luminescent bacterial suspension. The reaction takes place within a very short space of time: all zones with inhibitory or toxic effects appear as black zones, those with a stimulatory effect as lighter zones on the chromatogram.

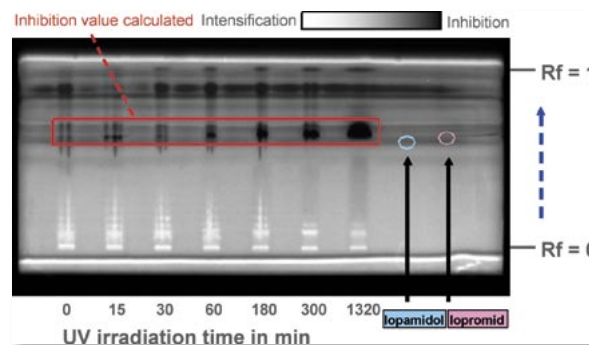
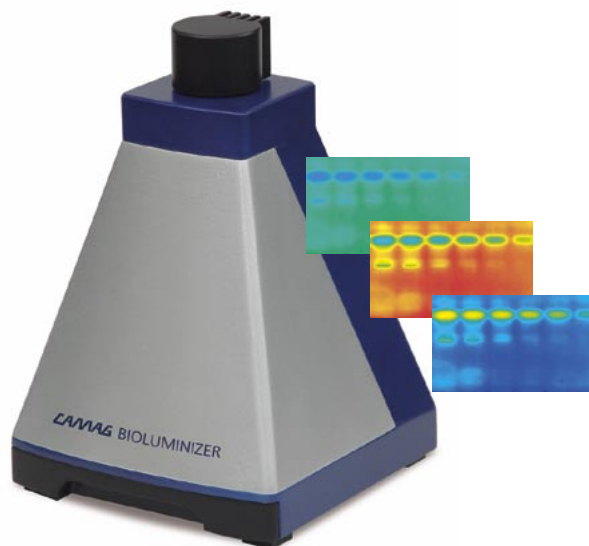
The following example is taken from an internship report at the Zweckverband Landeswasserversorgung in Langenau, Germany.

Process wastewater containing X-ray contrast media is frequently irradiated with UV light. In order to identify the oxidation products generated, wastewater samples and the reference samples are examined using effect-directed analysis and HPTLC separation.

The HPTLC/bioluminescence image shows the results for various irradiation times.

The bioactive effect of the degradation products can be clearly seen. An increase in the irradiation time generates substances with a distinctively inhibitory effect. In a cuvette test, this inhibitory effect would have been masked by degradation products, which stimulate luminescence and are visible in the lower section of the chromatogram.

[www.bioluminizer.com](http://www.bioluminizer.com) for more examples.



# CAMAG

## WORLD LEADER IN PLANAR CHROMATOGRAPHY

CAMAG · Sonnenmattstr.11 · CH-4132 Muttenz (Switzerland) · [www.camag.com](http://www.camag.com)