

Designer opioids – a new threat hitting the German drug market

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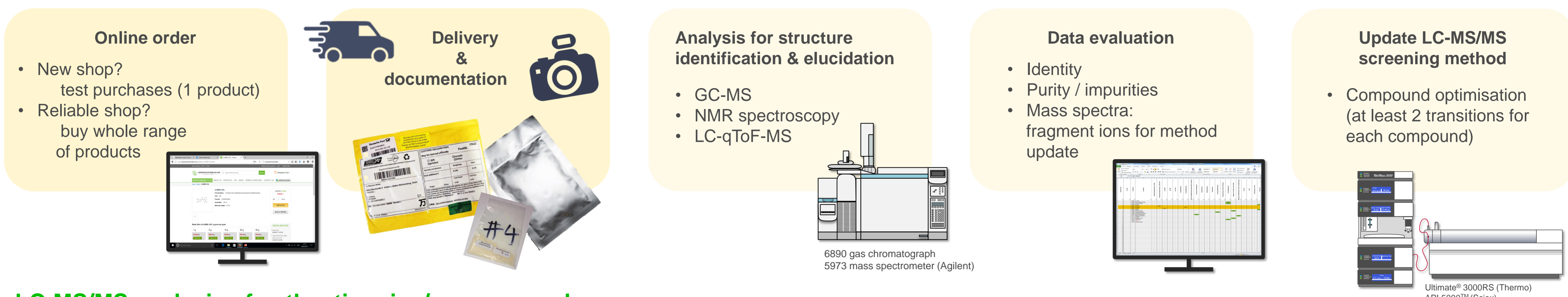
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Introduction

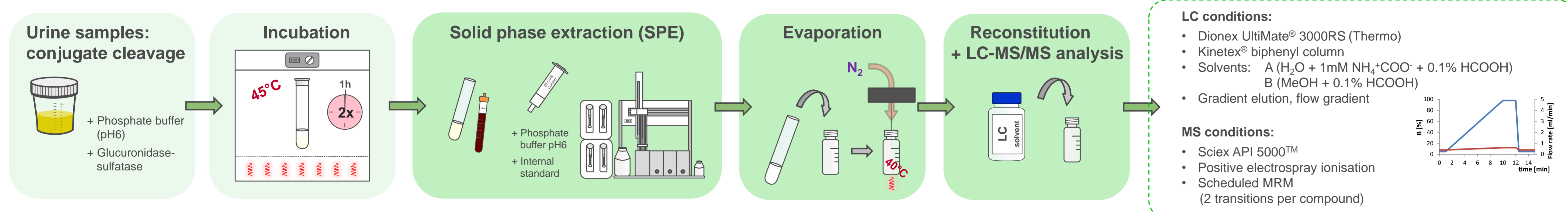
In recent years, opioid analogues had only a small share of the market of new psychoactive substances (NPS). In 2016, 'designer opioids' (DO) reached the German drug market with several cases of severe intoxications and fatalities being reported. In the present study DO were purchased from online vendors and structurally characterised.

Methods

Monitoring procedure



LC-MS/MS analysis of authentic urine/serum samples



Results & Discussion

Eleven DO – 8 fentanyl derivatives and 3 opioids developed by Upjohn ('U-drugs') – were purchased on the Internet in 2016 (chemical structures Fig.1). All analysed products contained the declared substances. Purity of the compounds was estimated by GC-MS and ranged from 61% (for Cyclopentylfentanyl (E)) to 99% (for U-49,900 (J)). The chemical structures were confirmed by comparison of analytical data from the EDND^[1] and by NMR and HRMS analysis.

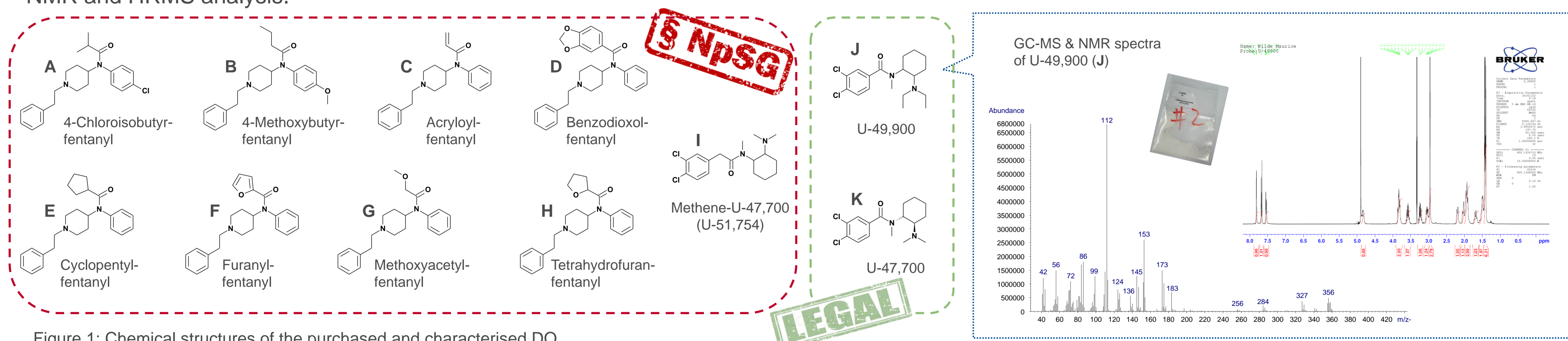
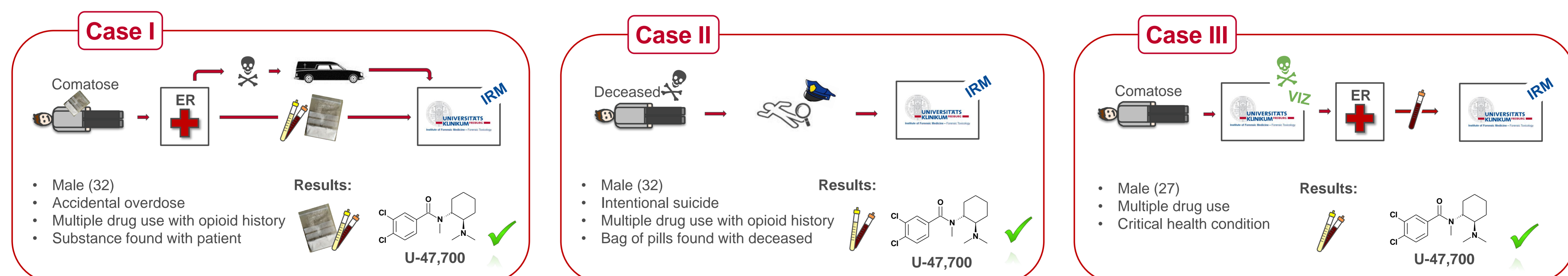


Figure 1: Chemical structures of the purchased and characterised DO.

Some of these DO have been detected in severe intoxication cases. The most prevalent DO detected in three cases in Freiburg since June 2016 was U-47,700 (K). U-47,700 has also been identified in over 15 authentic samples sent to our laboratory for NPS analysis. Furthermore, the fentanyl derivative furanylfentanyl (F) as well as the compound U-49,900 (J) were identified in two forensic cases.



Conclusion

Consumption of DO poses a high risk to public health, especially when co-used with other CNS depressants like benzodiazepines, which may lead to fatal intoxications. Since most of the fentanyl derivatives are covered by the German law on new psychoactive substances ('NPSG') due to the phenethylamine-like structural element, an increasing appearance of other opioids like the 'U-drugs' can be expected. Therefore, the market for research chemicals and 'legal highs' has to be monitored closely and screening methods have to be up-to-date.

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References

[1] European database on new drugs (EDND) provided by the EMCDDA <https://ednd.emcdda.europa.eu/html.cfm/index7246EN.html>

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