Analytical and clinical experiences –
from product monitoring to drug testing

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New psychoactive substances reported through the EWS
Results in positive serum samples (n = 734)
05/2010 – 03/2012 (selection of compounds)

Intoxication cases (rescue centers)

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Total number of analyzed intoxication cases: 97 (Freiburg area)
Intoxication cases: Main symptoms

- Tachycardia: 58%
- Severe vomiting: 29%
- Somnolence: 24%
- Panic attacks: 24%
- Severe agitation: 16%
- Hallucinations: 13%
- Hypokalaemia: 11%
- Seizures: 8%
- Coma: 5%
Risk potential

Acute effects:
- Seizures
- Vomiting & somnolence/coma => danger of aspiration!
- Tachycardia
- Psychosis
- Development of tolerance

Long term toxicity:
- ???  -> Redistribution, long terminal elimination half-lives
Examples for structural modifications

UR-144
$K_i$ (CB$_1$): 150 nM

JWH-018
$K_i$ (CB$_1$): 9.0 nM

AM-2201
$K_i$ (CB$_1$): 1.0 nM

AM-1220
$K_i$ (CB$_1$): 0.27 nM

AB-001
$K_i$ (CB$_1$): ?
Analysis of synthetic cannabinoids in biomatrices

**Blood (serum):** 34 synthetic cannabinoids
- up to date, quantitative results -> clinical evaluation
- invasive

**Urine:** 15 synthetic cannabinoids (metabolites)
- non-invasive sampling, high sensitivity (long term detectability),
- ‘lag time’ (metabolism), reference compounds, method development complex

**Hair:** Retrospective evaluation, contamination(?)

**Oral fluid:** Short term detectability (smoking), non-invasive
Why are analytical methods for blood/urine so important?

- One of the main motivations for SPICE consume is the ‘non-detectability’
- Deterrent effects (e.g. forensic psychiatry, road traffic…)

Caution: Interpretation can be difficult due to redistribution effects (low concentrations…)

- Immunoassay based tests not satisfactory (so far)
Conclusions

- Use of synthetic cannabinoids is definitely more dangerous than cannabis use (potency, structural variety)
- First time consumers and high-dose users are most vulnerable
- Analytical methods are highly preventive but need to be updated regularly
- Systematic surveillance is absolutely necessary (quick changes on the market)
Acknowledgement

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