Profiles, Pharmacological Interactions, and Toxicity of “Tusibi” and Bath Salts Consumed at Colombian Electronic Music festivals

Part of

Characterization of the use of psychoactive substances and drugs of abuse in cases of forensic interest: direct correlation with violence and accidents for strengthening surveillance, diagnosis and control systems

Disclaimer: opinions and views expressed in this conference are those of the author and do not reflect the official stance of my employers, funding agencies…

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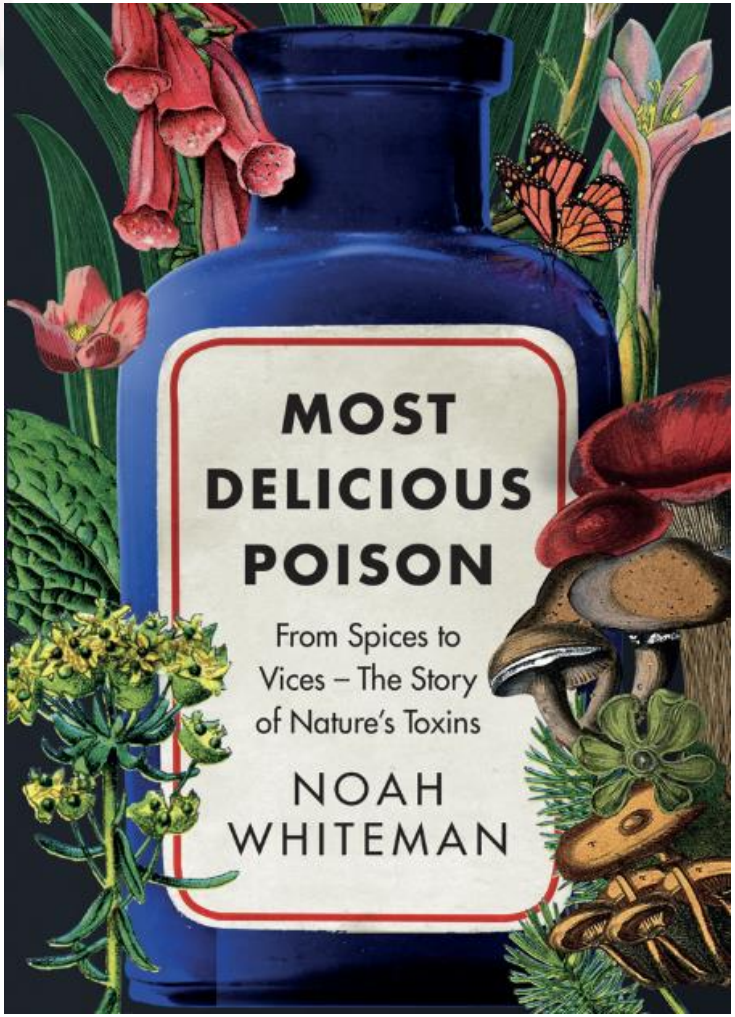
General Context



General Context

1. **Factors to consider for a successful identification**

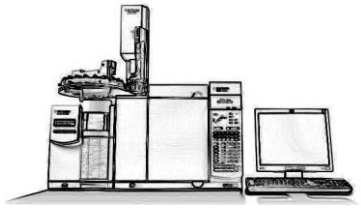
1- Drug properties influencing pharmacokinetics (ADME) and pharmacodynamics

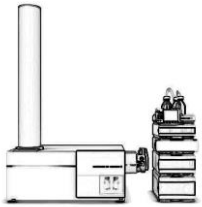
2- Sample collection, handling, storage, pre-processing (parent drug and metabolite extraction)

3. Technology: FT-IR, GC-MS, GC-MS/MS, LC-MS…

4. Data processing post-acquisition

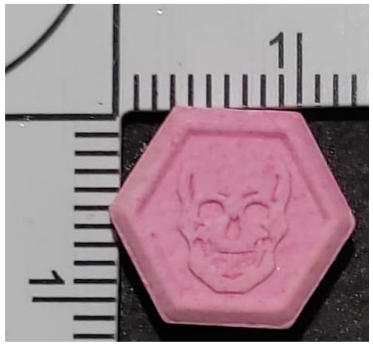
Are there reference standards available?

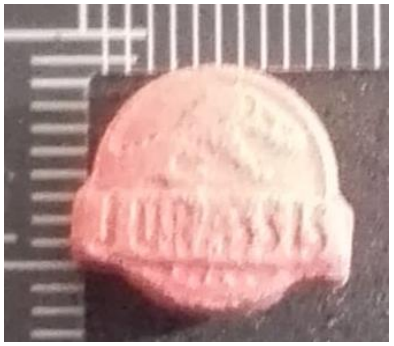


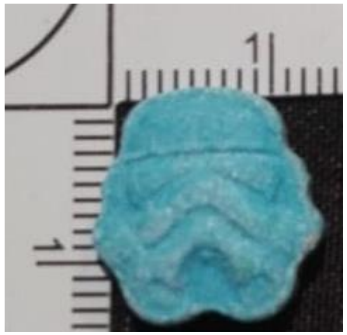


Methodology for non biological samples

ÉCHELE CABEZA

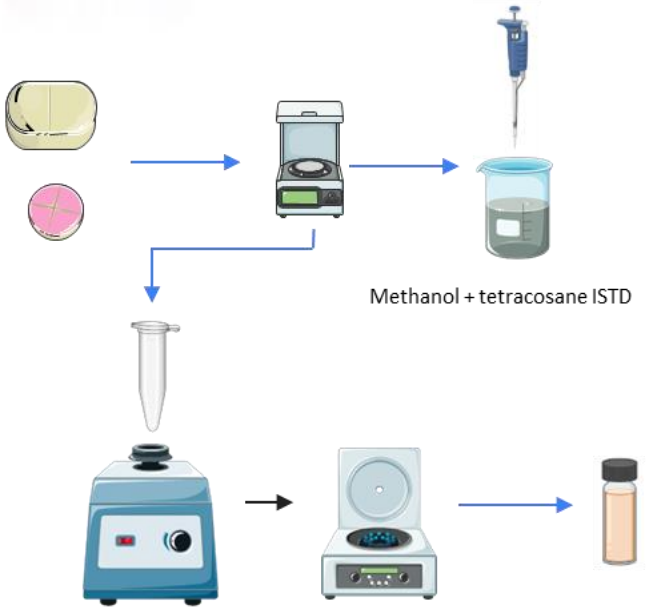






Methodology for non biological *NB* samples

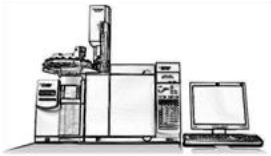
1. Sample preparation



Methanol + tetracosane ISTD

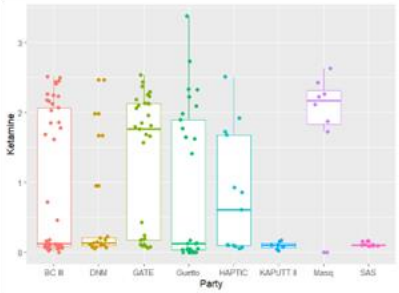
2. Data acquisition

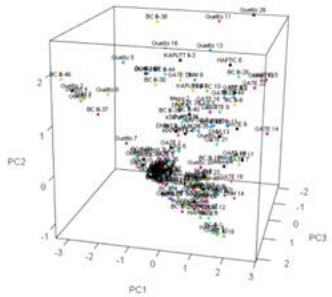
System suitability
Randomization
Pos/neg controls
Pool QCs
Solvent blanks



3. Data processing

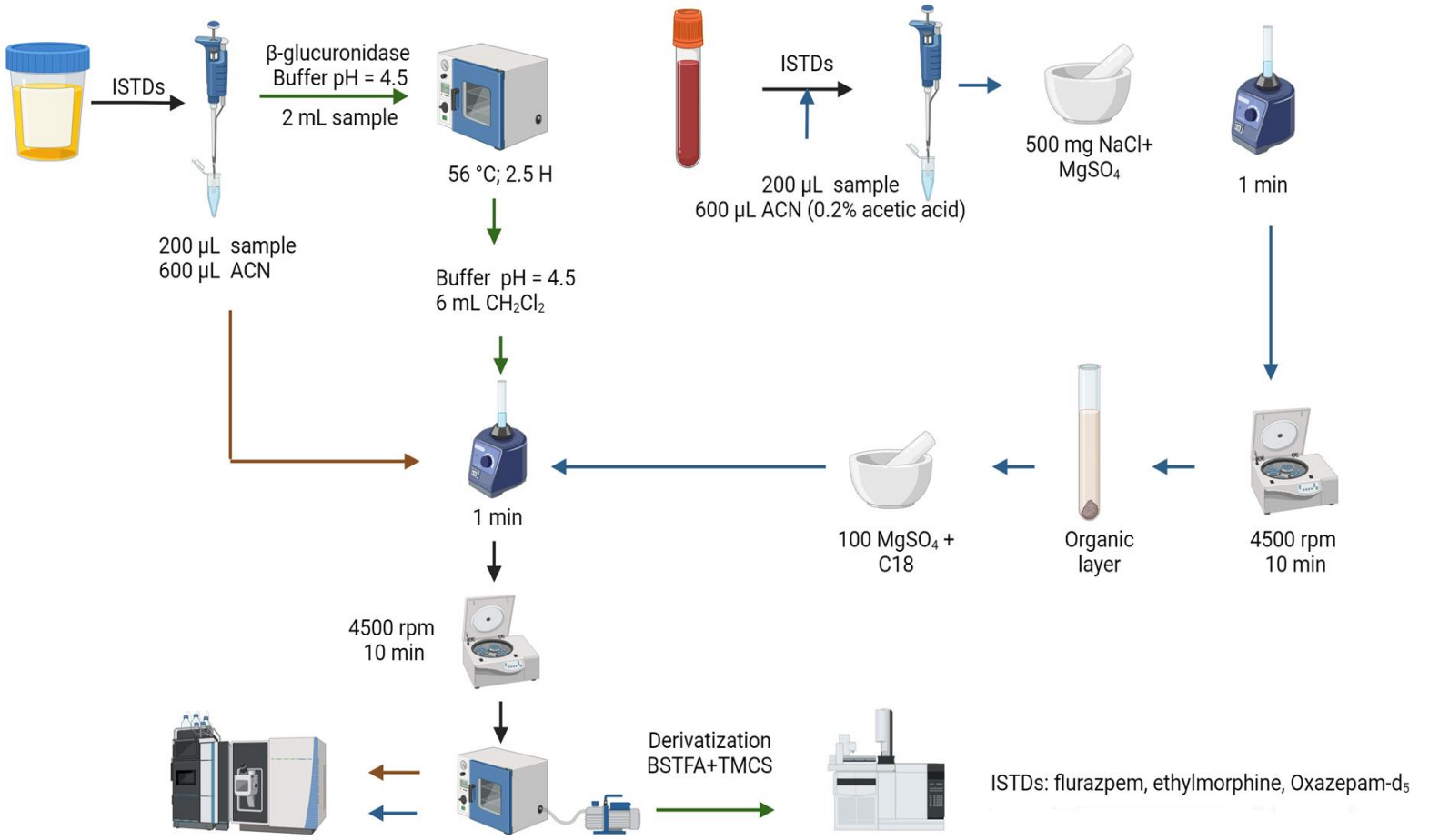
Deconvolution
Tentative annotation
Imputation
Normalization
Power transformation



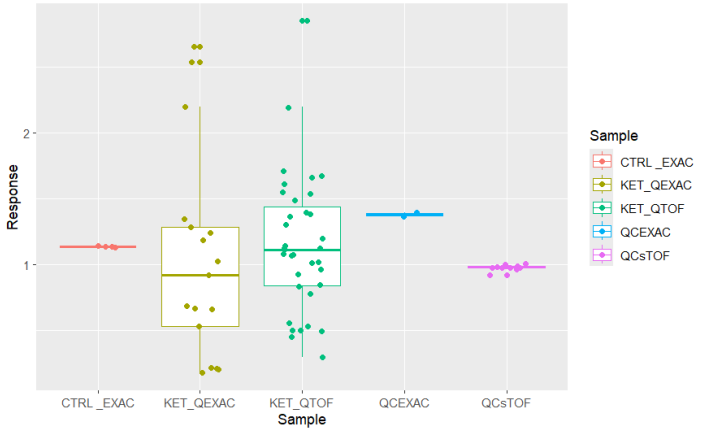


For comparison between IR an GC-MS

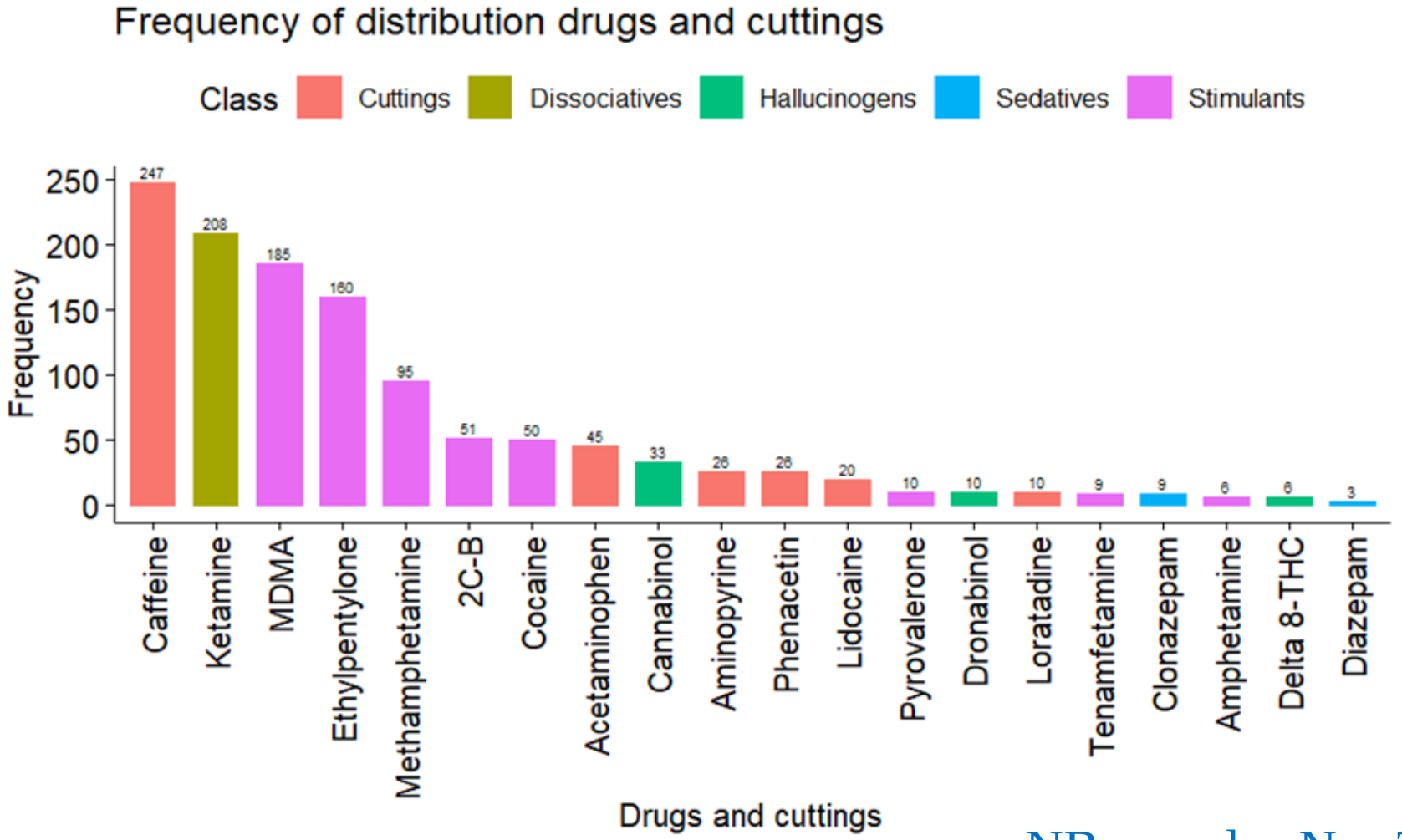
Our baseline / state of the art



Methodology for biological postmortem samples

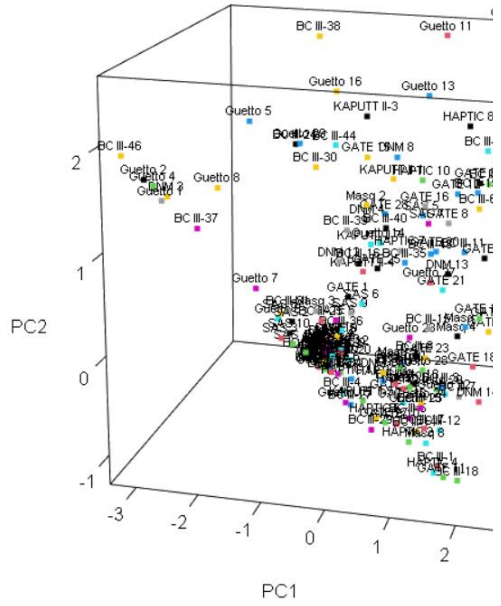


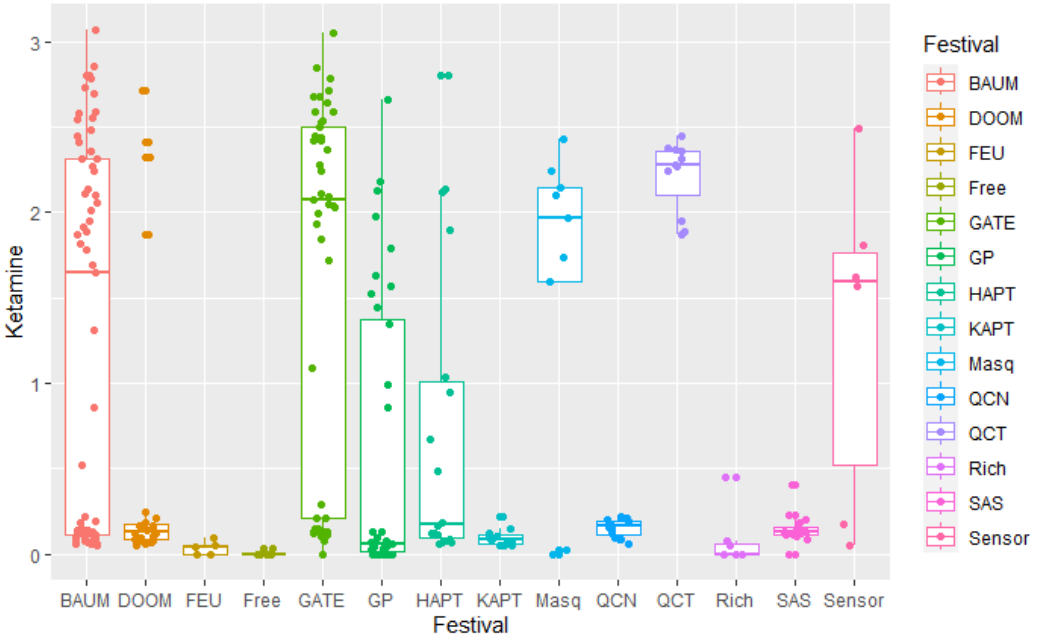
Results and conclusions



NB samples N = 300

Results and conclusions





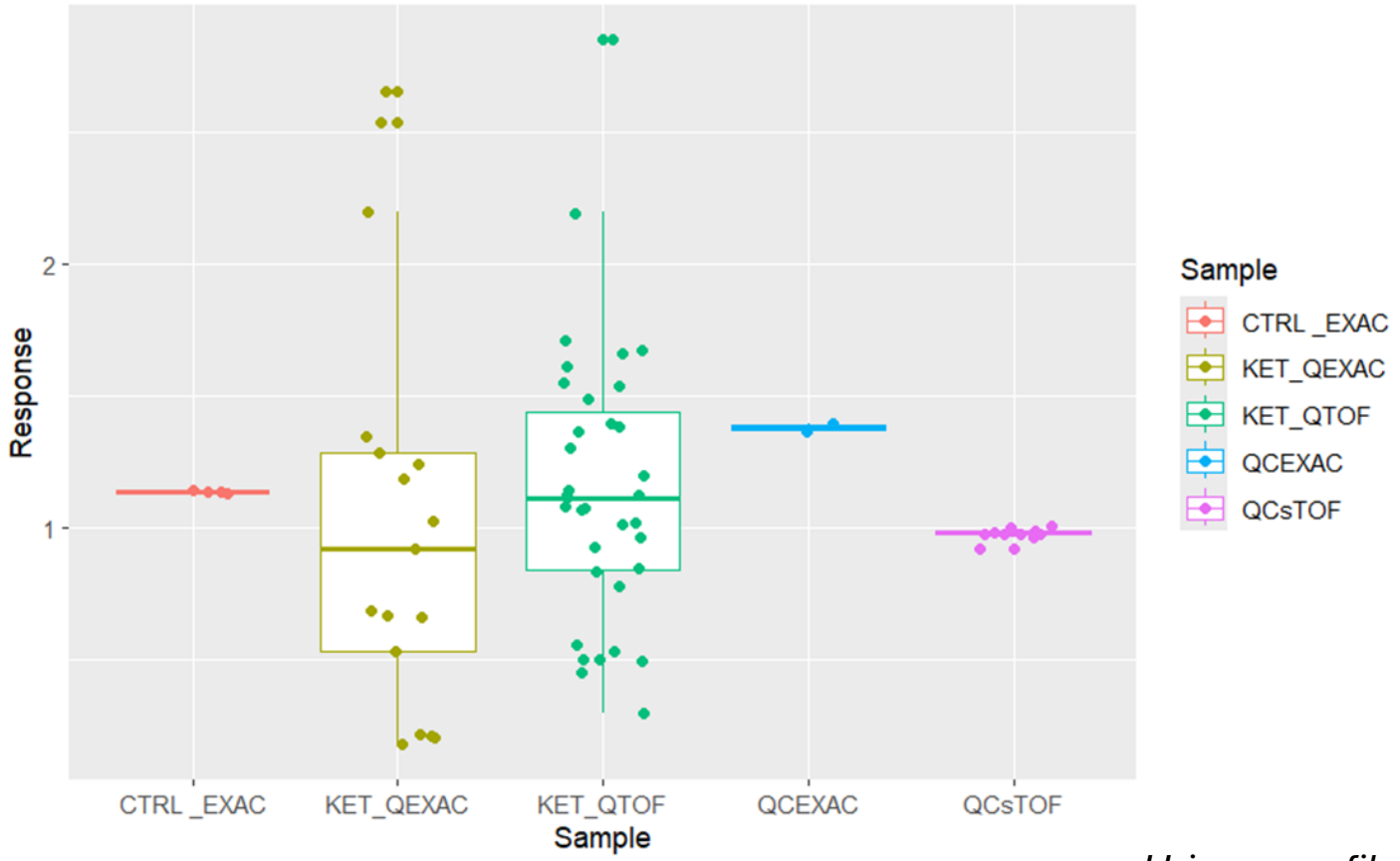
Boxplot of the comparison of the normalized base peak intensities of ketamine between 12 electronic music festivals. QCT / QCN quality controls for “tusibi” GC-MS runs

Plot3d main drugs relative quantities per electronic music festival. There is a significant difference in the profiles and relative amounts of drugs between and among parties. No grouping associated with electronic music festivals is observed

Findings in 300 non-biological “club drugs” samples

Results and conclusions

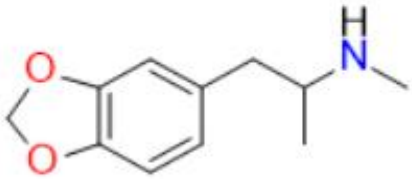
Significative differences between relative concentrations

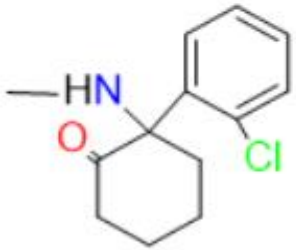


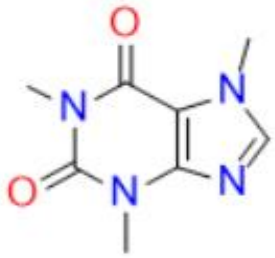
Urinary profiles N = 80

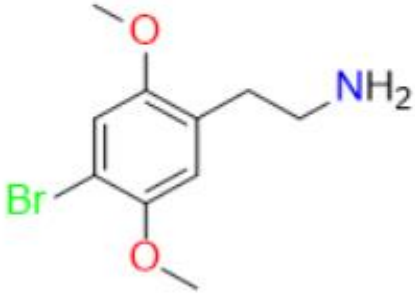
Results and conclusions

MDMA	Ketamine	Caffeine	2-CB
logP = 1.65	*logP* = 2.69	*logP* = -0.24	*logP* = 1.99
vd = 5 L/kg	vd = 0.37 L/kg	vd = 0.6 L/kg	vd = 16 L/kg







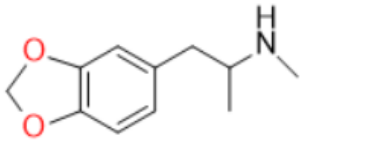


Tusibi, tucibi, tusi, tuci: sniffed max 60 mg dose

2C-B: oral 30 mg

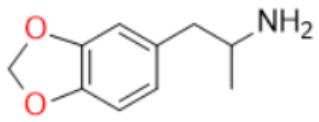
Risk of adverse events: different SNC effects, compositions, ADME, plasmatic concentrations…

Results and conclusions



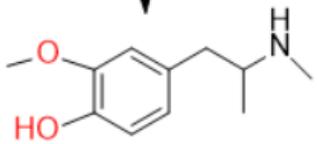
3,4-methylenedioxymethamphetamine **MDMA**
M+H 194.11756

N-demethylation



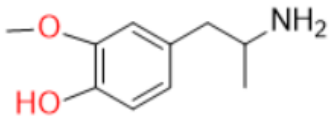
3,4-methylenedioxyamphetamine **MDA**
M+H 180.10191

O-demethylation



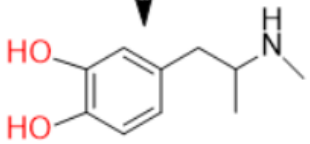
4-hydroxy-3-methoxymethamphetamine **HMMA**
M+H 196.13321

O-demethylation



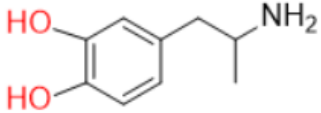
4-hydroxy-3-methoxyamphetamine **HMA**
M+H 182.11772

O-demethylation



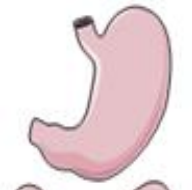
3,4-dihydroximethamphetamine **HHMA**
M+H 182.11755

O-demethylation



3,4-dihidroxyanfetamina **HHA**
M+H 168.10191

Proposed in silico and in vivo (postmortem) metabolic routes



Absorption
Inhibition/induction of intestinal.
enzymes or transporters.

Genetics.
Individual factors (diet, age, lifestyle...)

Physicochemical properties

Sympathetic system activation/depression

BBB

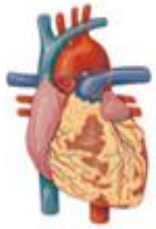
Inhibition of serotonin and norepinephrine reuptake.
Rise in body temperature.
RAAS activation.
Hallucinations.
Anesthesia.
Respiratory effects

Metabolism
Inhibition/induction of hepatic.
enzymes or transporters.

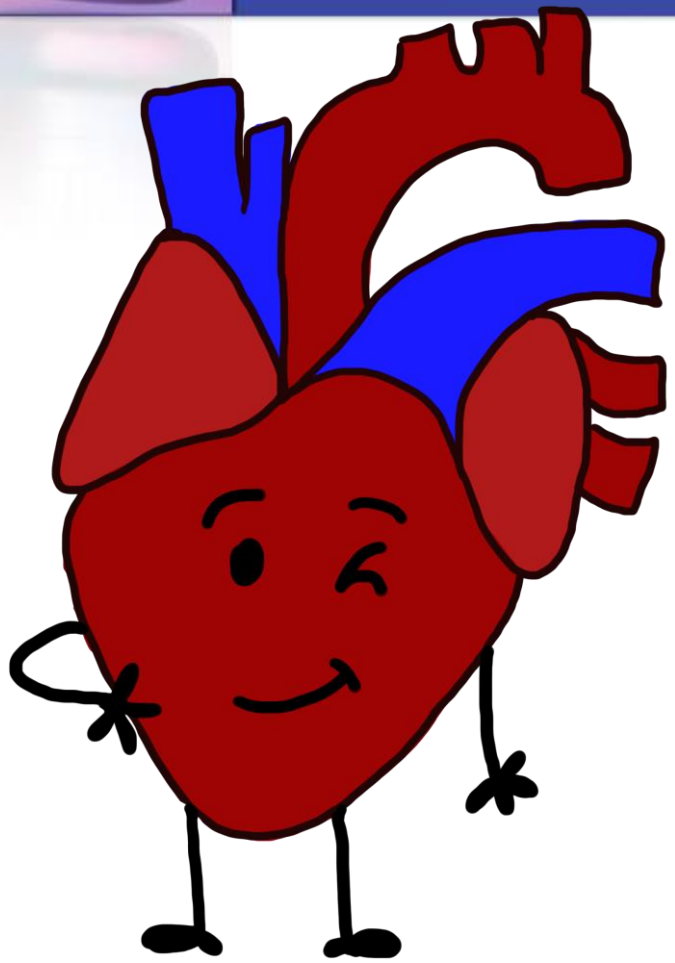
Distribution

Excretion
Renal function decline.
Inhibition of renal drug transporters.
Inhibition intravascular volume.
Declines glomerular filtration.
Hydronephrosis/cystitis.

Vasodilation.
Dopaminergic / Anticholinergic effect.
Inhibition of cGMP degradation
Decreased chronotropic and inotropic.
Bradycardia.
Atrioventricular block.
Electrolyte disturbances.
Increases in blood pressure.
Hemodynamic instability.
Heart rate and cardiac index.



Main drug-drug interactions



Thanks a lot…

- Questions?... easy ones please
- Comments… be nice please
- Reviews … constructive ones
- Contributions… in cash please

If I have seen further, it is by standing on the shoulders of giants