

## **CURRICULUM VITAE of Thomas Kraemer**

### **Personal information**

Name Thomas Kraemer  
born 5<sup>th</sup> July, 1964, in Puettlingen/Germany  
unmarried

Nationality German (C-permit MA0238522)

Languages German, English, French

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### **Education and academic positions**

1989 Master of science in pharmacy, awarded pharmacist's license (21.12.1989)

1994 PhD Dissertation (Prof. Dr. Hans H. Maurer, University of Saarland, Germany, 19.12.1994)

1999 Board Certified Pharmacist of Pharmaceutical Analytics (12.08.1999)

2002-2005 Chairman of the Young Scientist Committee of TIAFT

2004 Habilitation for Pharmacology and Toxicology (29.06.2004)

2004 Offer of a Full Professorship at Eppendorf University, Hamburg

2005 Professor for Pharmacology and Toxicology, Saarland University (01.06.2005)

2007 Senior University Lecturer, Saarland University (03.04.2007)

2008 Forensic Toxicologist GTFCh (04.04.2008)

2011 Professor ad personam for Forensic Pharmacology and Toxicology, UZH (01.04.2011)

2013-2014 Steering Committee XeRR and Vice President

2015 Forensic Toxicologist SGRM (21.11.2015)

2015 Member of Drug Discovery Network Zurich as part of "Hochschulmedizin Zürich"

2017 Confirmation as Professor for Forensic Pharmacology and Toxicology, UZH (01.04.2017)

2017-2019 Head of "Fachbereich Querschnittsfächer" of the Medical Faculty of UZH

2021 Full member of Center of Competence Sleep and Health Zurich

### **Employment History**

1994 Deputy Head, Department of Experimental and Clinical Toxicology, Saarland University

2004 Head of the Forensic Toxicology Lab, Saarland University

2009 Head, Department of Forensic Chemistry and Toxicology (since 2010 Forensic Pharmacology and Toxicology), University of Zurich

### **Institutional Responsibilities**

Deputy Head of the Institute of Forensic Medicine (IRM-UZH), Member of the executive board of IRM-UZH

Head of the Department of Forensic Pharmacology and Toxicology

Guidance and Organization of Research and Service for Police and State attorneys

Planning, organization and realization of research projects; Supervision of Master, PhD students and Postdocs

Service work: Writing expert reports in forensic toxicological questions for police and state attorneys; Active teaching of police officers and state attorneys; Prevention work (against therapeutic or illegal drug (ab)use)

### **Approved Research Projects**

**2012** Swiss National Science Foundation (SNSF) "Dietary microparticles and their impact on Inflammatory Bowel Disease pathogenesis - Large Nested Project within the SWISS IBD Cohort Study"  
(Grant No. SNSF 138291): 283'646 CHF (Co-Applicant with Prof Gerhard Rogler)

**2016** Swiss National Science Foundation (SNSF) "Dietary microparticles and their impact on Inflammatory Bowel Disease pathogenesis - Large Nested Project within the SWISS IBD Cohort Study"  
(Grant No SNSF 170109): 286'000 CHF (Co-Applicant with Prof Gerhard Rogler)

**2016** Swiss National Science Foundation (SNSF) „Postmortem redistribution of centrally acting drugs“ (Grant No. SNSF 310030\_165875): CHF 94'217.00 (Co-applicant with Andrea Steuer, post-doc in own research group)

**2018** Swiss National Science Foundation (SNSF) R'Equip “Ion Mobility Mass Spectrometry to Unscramble Complex Biological Samples” (Grant No. SNSF 206021\_183310): 479'561 CHF (other applicant with Laurent Bigler)

### **Supervision of Junior Researchers**

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#### ***Post-Docs:***

*Andrea Steuer (Habilitation 2018) and Tina Binz (Habilitation 2020)*

#### ***PhD students:***

*Robert Erne (2020), Marco Elmiger (2019), Krishna Tulasi Kirla (2017), Michael Poetzsch (2015), Andreas Roemmelt (2015), Milena Madry (2014), Kristina Rust (2012)*

*Ongoing: Michael Scholz, Gabriel Streun,*

*Co-supervision with Andrea Steuer and Tina Binz*

*Lisa Eisenbeiss (2021), Lana Brockbals (2020), Martina Boxler: (2018), Sandra Staeheli: (2017)*

*Ongoing: Yannick Wartmann, Tom Schneider, Clarissa Voegel*

#### ***Master students (pharmacy, chemistry, biomedicine – (co-)supervision):***

*Yannick Wartmann (2021), Ilja Shapiro (2020), Fabio Simbuerger (2020), Daria Kaelin (2019), Gabriel Streun (2018), Dominique Kamber (2018), Justine Raeber (2018), Franziska Gähler (2017), Kim Arnold (2017), Woula Goutziomitos (2016), Elena Williner (2016), Lorena Stock (2015), Corina Schmidhauser (2014), Martina I. Boxler (2013), Sandra N. Stäheli (2012)*

### **Teaching Activities**

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Lectures and courses in pharmacology, toxicology and analytics for students of medicine, law, biomedicine and chemistry; Continuing education and CAS courses for physicians, police and state attorneys

### **Membership in Scientific Societies**

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Swiss Society of Forensic Medicine (SGRM)

The International Association of Forensic Toxicologists (TIAFT)

Society of Toxicological and Forensic Chemistry (GTFCh)

German Pharmaceutical Society (DPhG)

### **Active Membership in Scientific Societies**

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2011-2013 President Mosbach Meetings of the GTFCh (Society of Toxicological and Forensic Chemistry)

2011-2013 Associated board member of GTFCh

2002-2005 Chairman of the Young Scientist Committee of TIAFT

### **Organisation of conferences**

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Member Organizing committee of the TIAFT Meeting in Bonn 2010

Member Organizing Committee of the DGRM meeting in Luzern 2020

Member in Scientific Committees of several TIAFT and GTFCh meetings

### **Editorial and Scientific Reviewing Activities**

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Guest Editor of Forensic Science International; Ad hoc referee for a wide range of Journals, among others: Nature; Anal. Bioanal. Chem.; Arch. Pharm. Pharm. Med. Chem.; Clin. Chem.; Intern. J. Legal Med.; Therapeut. Drug Monit.; International Journal for Pharmaceutical and Medicinal Chemistry; J. Chromatogr. A and B; Bioanalysis; Forensic Science International; Drug Testing and Analysis

### **Prizes, Awards**

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1999 Young Scientist Award of the Society of Toxicological and Forensic Chemistry (GTFCh)

## Major scientific achievements of Thomas Kraemer

The Department of Forensic Pharmacology and Toxicology is part of the Institute of Forensic Medicine. We perform public service tasks for the police and the public prosecutor's office to maintain legal security in the Canton of Zurich and central Switzerland. Besides these highly important services for society, research is the second task. In the process, routine work influences research and vice versa. This is also necessary because clinical studies with illegal drugs are mostly prohibited in forensics (in contrast to the clinical field with therapeutic drugs). When I took over as head of the department, I founded a research group, which I still lead today. It consists of two post-docs who also conduct research in addition to their service duties. Both (Andrea Steuer and Tina Binz) were thus able to achieve their habilitation. In addition, 4 PhD students and 1 or more master-Students or interns typically belong to the group.

There is a clear, systematic development in my scientific career. It all started with achievements in analytical toxicology. Due to my internationally recognized experience (several invited keynote lectures to congresses of mass spectrometry societies) with development of the most sophisticated procedures for detection and quantification of almost any analyte in even the dirtiest matrices using all kind of high-tech instrumentation such as gas chromatography-(high-resolution) mass spectrometry (GC-(HR)MS), liquid chromatography – (high resolution) tandem mass spectrometry (LC-(HR)MS/MS), matrix-assisted laser desorption ionization-mass spectrometry imaging (MALDI-MSI), inductively-coupled plasma-mass spectrometry (ICP-MS) or even time of flight – secondary ion mass spectrometry (ToF-SIMS), highly exciting own projects could be accomplished and many requests for collaborations reached me from UZH colleagues and from other universities. It must be emphasized that it is not just about mastering technology (technology-driven research), but about analyzing scientific problems and developing solution strategies with the help of state-of-the-art techniques. So, it is hypothesis-driven research! Thus, we were the first to address an old problem in forensic toxicology by exploring **SWATH technology** (Sequential Window Acquisition of all Theoretical Mass Spectra, a data independent acquisition method), originally designed for proteomics, for small molecules relevant to forensics. We succeeded in showing that **simultaneous search analysis and quantitative determination** of the identified molecules are possible in the same run - a much noted paradigm shift in analytical forensic toxicology.

Data independent acquisition and high-resolution mass spectrometry lead to an ever higher data load that has to be coped with. In an ongoing project, we successfully explored possibilities to **master the big data problem in forensic toxicology**. First, we tried simpler calibration models or parameter optimization for feature and hit generation with some success. However, especially with untargeted metabolomics methods more and more used also in our group (driven by my post-doc Andrea Steuer), it got more and more difficult to master the data overload. The newly established forensic metabolomics methods employed gas chromatography (GC) Orbitrap-MS and LC- quadrupole time of flight (TOF)-MS equipment. We were one of the first groups who applied **metabolomics methods for several important forensic questions**: screening for indirect markers of drug consumption; biomarkers to improve forensic case interpretation (e.g. GHB) or to identify sample manipulation attempts of urine and hair samples. In a side project, I successfully employed these metabolomics methods for chemical characterization and differentiation of canopic jar and mummy samples from Ancient Egypt (published in Analyst). With all these methods creating more and more data, I **started a machine learning project** in the group that has already yielded results (and publications). Using an interpretable

machine learning model, we can now detect chemically adulterated urine samples analyzed by high resolution mass spectrometry. At the moment, automated detection of synthetic cannabinoids in urine samples using machine learning is successfully tested by one of my PhDs.

Another achievement was the proof of concept that **Zebrafish (Danio rerio) early life stages** can serve as **alternative model to study new psychoactive substances (NPS)**. NPS are a huge problem in forensic toxicology with up to 100 new psychoactive substances emerging on the illegal market each year. We could show that the model can help to understand their toxicity and behavioural effects. For this project we established a collaboration with the zebrafish experts at EAWAG (Prof. Schirmer). One of the resulting papers was the cover story of the journal Toxicological Sciences by Oxford academic.

A collaboration with Professor Rogler from USZ proved to be scientifically very successful (SNF funding 324730\_170109 and 138291 with me as co-applicant) and publication in a high-ranked journal (Gut). This collaboration was about **titanium dioxide (TiO<sub>2</sub>) nanoparticles** which are widely used as food additives or in pharmaceutical formulations and are consumed by millions of people on a daily basis. It was our ICP-MS method that was finally able to sensitively determine titanium in blood and tissue samples and thus to show that people with a defective intestinal barrier function and pre-existing inflammatory condition, such as an intestinal bowel disease, might be negatively impacted by the use of TiO<sub>2</sub> nanoparticles. With more and more scientific proof of the dangers of TiO<sub>2</sub> nanoparticles (a.k.a. E171), their use as food additive has been banned in France and Switzerland.

**Establishing hair analytics for forensic and clinical research:** Our outstanding abilities in hair analysis led to a very successful collaboration with Professor Quednow from the (Psychiatrische Universitätsklinik Zürich) with 10 publications (and ongoing). He highly appreciates our ability to confirm even long-term consumption of illegal or therapeutic drugs, where he typically can rely only on self-declarations. With my post-doc Tina Binz further broadening our portfolio in hair analysis with highly sophisticated **methods for stress marker cortisol and endocannabinoids**, we can offer even more scientific insights, which is unique in the world.

Unfortunately, hair analysis was criticized in some publications that claimed that external contamination of the hair was indistinguishable from a true finding. In a study that was also supported by the competitive Candoc program of the UZH, I could show in a series of papers, that differentiation of intake and contamination was possible using correct washing procedures and metabolite ratios. Some of the highly sophisticated studies received international attention (articles about our work in „C&EN“ and „The Analytical Scientist“). **Our highly acclaimed work** has restored confidence in hair analysis and has thus made it possible that **hair analyses can continue to be used with confidence in legal proceedings** as well.

What I personally consider my greatest scientific achievement is the promotion of young scientists: 2 habilitations, 10 PhDs and numerous master theses from my small research group since its founding here at UZH. Members of the group have been awarded with more than a dozen national and international scientific awards (Best oral presentation, Best poster, Best PhD-thesis, Young scientist award etc.). Obviously, my group does something right in its research.

## Research output Thomas Kraemer (5 years 2016 – 11/2021)

### Full list:

A complete list of publications can be found under:

<https://orcid.org/0000-0002-3283-606X> or



### Publications in international peer-reviewed scientific journals

1. Voegel, C. D.; Kroll, S. L.; Schmid, M. W.; Kexel, A. K.; Baumgartner, M. R.; **Kraemer, T.**; Binz, T. M.; Quednow, B. B., Alterations of stress-related glucocorticoids and endocannabinoids in hair of chronic cocaine users. *Int J Neuropsychopharmacol* **2021**.
2. Voegel, C. D.; Baumgartner, M. R.; **Kraemer, T.**; Wust, S.; Binz, T. M., Simultaneous quantification of steroid hormones and endocannabinoids (ECs) in human hair using an automated supported liquid extraction (SLE) and LC-MS/MS - Insights into EC baseline values and correlation to steroid concentrations. *Talanta* **2021**, *222*, 121499.
3. Stucki, M.; Voegel, C. D.; Binz, T. M.; **Kraemer, T.**; Lavaud, A.; Voelter, K., Systemic detectability of dexamethasone and prednisolone after eye drop application in horses. *Equine Vet J* **2021**.
4. Streun, G. L.; Steuer, A. E.; Ebert, L. C.; Dobay, A.; **Kraemer, T.**, Interpretable machine learning model to detect chemically adulterated urine samples analyzed by high resolution mass spectrometry. *Clin Chem Lab Med* **2021**, *59* (8), 1392-1399.
5. Steuer, A. E.; Raeber, J.; Simbuerger, F.; Dornbierer, D. A.; Bosch, O. G.; Quednow, B. B.; Seifritz, E.; **Kraemer, T.**, Towards Extending the Detection Window of Gamma-Hydroxybutyric Acid-An Untargeted Metabolomics Study in Serum and Urine Following Controlled Administration in Healthy Men. *Metabolites* **2021**, *11* (3).
6. Scholz, C.; Madry, M. M.; **Kraemer, T.**; Baumgartner, M. R., LC-MS/MS Analysis of Delta9-THC, CBN and CBD in Hair: Investigation of Artefacts. *J Anal Toxicol* **2021**.
7. Scholz, C.; Cabalzar, J.; **Kraemer, T.**; Baumgartner, M. R., A Comprehensive Multi-Analyte Method for Hair Analysis: Substance-Specific Quantification Ranges and Tool for Task-Oriented Data Evaluation. *J Anal Toxicol* **2021**, *45* (7), 701-712.
8. Madry, M. M.; Poetzsch, S. N.; Steuer, A. E.; **Kraemer, T.**; Baumgartner, M. R., Significance of Metabolite Ratios in the Interpretation of Segmental Hair Testing Results-Differentiation of Single from Chronic Morphine Use in a Case Series. *Metabolites* **2021**, *11* (8).
9. Kirla, K. T.; Erhart, C.; Groh, K. J.; Stadnicka-Michalak, J.; Eggen, R. I. L.; Schirmer, K.; **Kraemer, T.**, Zebrafish early life stages as alternative model to study 'designer drugs': Concordance with mammals in response to opioids. *Toxicol Appl Pharmacol* **2021**, *419*, 115483.
10. Erne, R.; Baumgartner, M. R.; **Kraemer, T.**, Insights into the Decontamination of Cocaine-Positive Hair Samples. *J Anal Toxicol* **2021**, *45* (7), 713-721.
11. Dornbierer, D. A.; Yerlikaya, F.; Wespi, R.; Boxler, M. I.; Voegel, C. D.; Schnider, L.; Arslan, A.; Baur, D. M.; Baumgartner, M. R.; Binz, T. M.; **Kraemer, T.**; Landolt, H. P., A novel bedtime pulsatile-release caffeine formula ameliorates sleep inertia symptoms immediately upon awakening. *Sci Rep* **2021**, *11* (1), 19734.
12. Brockbals, L.; Wartmann, Y.; Mantiniaks, D.; Glowacki, L. L.; Gerostamoulos, D.; **Kraemer, T.**; Steuer, A. E., Postmortem Metabolomics: Strategies to Assess Time-Dependent Postmortem Changes of Diazepam, Nordiazepam, Morphine, Codeine, Mirtazapine and Citalopram. *Metabolites* **2021**, *11* (9).

13. Brockbals, L.; Staeheli, S. N.; Gascho, D.; Ebert, L. C.; **Kraemer, T.**; Steuer, A. E., Time- and Site-Dependent Postmortem Redistribution of Antidepressants and Neuroleptics in Blood and Alternative Matrices. *J Anal Toxicol* **2021**, *45* (4), 356-367.
14. Voegel, C. D.; Hofmann, M.; **Kraemer, T.**; Baumgartner, M. R.; Binz, T. M., Endogenous steroid hormones in hair: Investigations on different hair types, pigmentation effects and correlation to nails. *Steroids* **2020**, *154*, 108547.
15. Streun, G. L.; Elmiger, M. P.; Dobay, A.; Ebert, L.; **Kraemer, T.**, A machine learning approach for handling big data produced by high resolution mass spectrometry after data independent acquisition of small molecules - Proof of concept study using an artificial neural network for sample classification. *Drug Test Anal* **2020**, *12* (6), 836-845.
16. Steuer, A. E.; Kaelin, D.; Boxler, M. I.; Eisenbeiss, L.; Holze, F.; Vizeli, P.; Czerwinska, J.; Dargan, P. I.; Abbate, V.; Liechti, M. E.; **Kraemer, T.**, Comparative Untargeted Metabolomics Analysis of the Psychostimulants 3,4-Methylenedioxy-Methamphetamine (MDMA), Amphetamine, and the Novel Psychoactive Substance Mephedrone after Controlled Drug Administration to Humans. *Metabolites* **2020**, *10* (8).
17. Mohler, T.; Welter, J.; Steurer, M.; Neumann, L.; Zueger, M.; **Kraemer, T.**; Dullenkopf, A., Measuring the accuracy of propofol target-controlled infusion (TCI) before and after surgery with major blood loss. *J Clin Monit Comput* **2020**, *34* (1), 97-103.
18. Madry, M. M.; **Kraemer, T.**; Baumgartner, M. R., Large scale consumption monitoring of benzodiazepines and z-drugs by hair analysis. *J Pharm Biomed Anal* **2020**, *183*, 113151.
19. Erne, R.; Bernhard, L.; Kawecki, M.; Baumgartner, M. R.; **Kraemer, T.**, Using time-of-flight secondary ion mass spectrometry (ToF-SIMS) and matrix assisted laser desorption/ionization mass spectrometry (MALDI-MS) for investigations on single hair samples to solve the contamination versus incorporation issue of hair analysis in the case of cocaine and methadone. *Analyst* **2020**, *145* (14), 4906-4919.
20. Eisenbeiss, L.; Binz, T. M.; Baumgartner, M. R.; Steuer, A. E.; **Kraemer, T.**, A possible new oxidation marker for hair adulteration: Detection of PTeCA (1H-pyrrole-2,3,4,5-tetracarboxylic acid) in bleached hair. *Drug Test Anal* **2020**, *12* (2), 230-238.
21. Eisenbeiss, L.; Binz, T. M.; Baumgartner, M. R.; **Kraemer, T.**; Steuer, A. E., Towards Best Practice in Hair Metabolomic Studies: Systematic Investigation on the Impact of Hair Length and Color. *Metabolites* **2020**, *10* (10).
22. Eisenbeiss, L.; Binz, T. M.; Baumgartner, M. R.; **Kraemer, T.**; Steuer, A. E., Cheating on forensic hair testing? Detection of potential biomarkers for cosmetically altered hair samples using untargeted hair metabolomics. *Analyst* **2020**, *145* (20), 6586-6599.
23. Brockbals, L.; Staeheli, S. N.; **Kraemer, T.**; Steuer, A. E., Postmortem metabolomics: Correlating time-dependent concentration changes of xenobiotic and endogenous compounds. *Drug Test Anal* **2020**, *12* (8), 1171-1182.
24. Brockbals, L.; **Kraemer, T.**; Steuer, A. E., Analytical considerations for postmortem metabolomics using GC-high-resolution MS. *Anal Bioanal Chem* **2020**, *412* (24), 6241-6255.
25. Zoelch, N.; Hock, A.; Steuer, A. E.; Heimer, J.; **Kraemer, T.**; Thali, M. J.; Gascho, D., In situ postmortem ethanol quantification in the cerebrospinal fluid by non-water-suppressed proton MRS. *NMR Biomed* **2019**, *32* (5), e4081.
26. Steuer, A. E.; Raeber, J.; Steuer, C.; Boxler, M. I.; Dornbierer, D. A.; Bosch, O. G.; Quednow, B. B.; Seifritz, E.; **Kraemer, T.**, Identification of new urinary gamma-hydroxybutyric acid markers applying untargeted metabolomics analysis following placebo-controlled administration to humans. *Drug Test Anal* **2019**, *11* (6), 813-823.
27. Steuer, A. E.; Kamber, D.; **Kraemer, T.**, Evaluation of endogenous urinary biomarkers for indirect detection of urine adulteration attempts by five different chemical adulterants in mass spectrometry methods. *Drug Test Anal* **2019**, *11* (5), 638-648.
28. Steuer, A. E.; Brockbals, L.; **Kraemer, T.**, Metabolomic Strategies in Biomarker Research-New Approach for Indirect Identification of Drug Consumption and Sample Manipulation in Clinical and Forensic Toxicology? *Front Chem* **2019**, *7*, 319.
29. Steuer, A. E.; Arnold, K.; Kamber, D.; **Kraemer, T.**, Suitability evaluation of new endogenous biomarkers for the identification of nitrite-based urine adulteration in mass spectrometry methods. *Drug Test Anal* **2019**, *11* (2), 230-239.

30. Staeheli, S. N.; Veloso, V. P.; Bovens, M.; Bissig, C.; **Kraemer, T.**; Poetzsch, M., Liquid chromatography-tandem mass spectrometry screening method using information-dependent acquisition of enhanced product ion mass spectra for synthetic cannabinoids including metabolites in urine. *Drug Test Anal* **2019**, *11* (9), 1369-1376.
31. Staeheli, S. N.; Steuer, A. E.; **Kraemer, T.**, Identification of urinary metabolites of the synthetic cannabinoid 5F-CUMYL-P7AICA in human casework. *Forensic Sci Int* **2019**, *294*, 76-79.
32. Scholz, C.; Quednow, B. B.; Herdener, M.; **Kraemer, T.**; Baumgartner, M. R., Cocaine Hydroxy Metabolites in Hair: Indicators for Cocaine Use Versus External Contamination. *J Anal Toxicol* **2019**, *43* (7), 543-552.
33. Madry, M. M.; **Kraemer, T.**; Baumgartner, M. R., Cocaine adulteration with the anthelmintic tetramisole (levamisole/dexamisole): Long-term monitoring of its intake by chiral LC-MS/MS analysis of cocaine-positive hair samples. *Drug Test Anal* **2019**, *11* (3), 472-478.
34. Erne, R.; Bernard, L.; Steuer, A. E.; Baumgartner, M. R.; **Kraemer, T.**, Hair Analysis: Contamination versus Incorporation from the Circulatory System- Investigations on Single Hair Samples Using Time-of-Flight Secondary Ion Mass Spectrometry and Matrix-Assisted Laser Desorption/Ionization Mass Spectrometry. *Anal Chem* **2019**, *91* (6), 4132-4139.
35. Eisenbeiss, L.; Steuer, A. E.; Binz, T. M.; Baumgartner, M. R.; **Kraemer, T.**, (Un)targeted hair metabolomics: first considerations and systematic evaluation on the impact of sample preparation. *Anal Bioanal Chem* **2019**, *411* (17), 3963-3977.
36. Dornbierer, D. A.; Boxler, M.; Voegel, C. D.; Stucky, B.; Steuer, A. E.; Binz, T. M.; Baumgartner, M. R.; Baur, D. M.; Quednow, B. B.; **Kraemer, T.**; Seifritz, E.; Landolt, H. P.; Bosch, O. G., Nocturnal Gamma-Hydroxybutyrate Reduces Cortisol-Awakening Response and Morning Kynurenine Pathway Metabolites in Healthy Volunteers. *Int J Neuropsychopharmacol* **2019**, *22* (10), 631-639.
37. Dornbierer, D. A.; Baur, D. M.; Stucky, B.; Quednow, B. B.; **Kraemer, T.**; Seifritz, E.; Bosch, O. G.; Landolt, H. P., Neurophysiological signature of gamma-hydroxybutyrate augmented sleep in male healthy volunteers may reflect biomimetic sleep enhancement: a randomized controlled trial. *Neuropsychopharmacology* **2019**, *44* (11), 1985-1993.
38. Brockbals, L.; Staeheli, S. N.; Gentile, S.; Schlaepfer, M.; Bissig, C.; Bolliger, S. A.; **Kraemer, T.**; Steuer, A. E., Fatal poisoning involving cyclopropylfentanyl - Investigation of time-dependent postmortem redistribution. *Forensic Sci Int* **2019**, *294*, 80-85.
39. Boxler, M. I.; Schneider, T. D.; **Kraemer, T.**; Steuer, A. E., Analytical considerations for (un)-targeted metabolomic studies with special focus on forensic applications. *Drug Test Anal* **2019**, *11* (5), 678-696.
40. Wunderli, M. D.; Vonmoos, M.; Treichler, L.; Zeller, C.; Dziobek, I.; **Kraemer, T.**; Baumgartner, M. R.; Seifritz, E.; Quednow, B. B., Social Cognition and Interaction in Chronic Users of 3,4-Methylenedioxymethamphetamine (MDMA, "Ecstasy"). *Int J Neuropsychopharmacol* **2018**, *21* (4), 333-344.
41. Voegel, C. D.; La Marca-Ghaemmaghami, P.; Ehlert, U.; Baumgartner, M. R.; **Kraemer, T.**; Binz, T. M., Steroid profiling in nails using liquid chromatography-tandem mass spectrometry. *Steroids* **2018**, *140*, 144-150.
42. Staeheli, S. N.; Poetzsch, M.; Veloso, V. P.; Bovens, M.; Bissig, C.; Steuer, A. E.; **Kraemer, T.**, In vitro metabolism of the synthetic cannabinoids CUMYL-PINACA, 5F-CUMYL-PINACA, CUMYL-4CN-BINACA, 5F-CUMYL-P7AICA and CUMYL-4CN-B7AICA. *Drug Test Anal* **2018**, *10* (1), 148-157.
43. Madry, M. M.; **Kraemer, T.**; Baumgartner, M. R., Systematic assessment of different solvents for the extraction of drugs of abuse and pharmaceuticals from an authentic hair pool. *Forensic Sci Int* **2018**, *282*, 137-143.
44. Kirla, K. T.; Groh, K. J.; Poetzsch, M.; Banote, R. K.; Stadnicka-Michalak, J.; Eggen, R. I. L.; Schirmer, K.; **Kraemer, T.**, Importance of Toxicokinetics to Assess the Utility of Zebrafish Larvae as Model for Psychoactive Drug Screening Using Meta-Chlorophenylpiperazine (mCPP) as Example. *Front Pharmacol* **2018**, *9*, 414.
45. Ganz, K.; Jenny, D.; **Kraemer, T.**; Jenni, L.; Jenni-Eiermann, S., Prospects and pitfalls of using feathers as a temporal archive of stress events and environmental pollutants: a review and case study. *Journal of Ornithology* **2018**, *159* (3), 771-783.
46. Ganz, K.; Jenni, L.; Madry, M. M.; **Kraemer, T.**; Jenny, H.; Jenny, D., Acute and Chronic Lead Exposure in Four Avian Scavenger Species in Switzerland. *Arch Environ Contam Toxicol* **2018**, *75* (4), 566-575.
47. Elmiger, M. P.; Poetzsch, M.; Steuer, A. E.; **Kraemer, T.**, Parameter Optimization for Feature and Hit Generation in a General Unknown Screening Method-Proof of Concept Study Using a Design of Experiment Approach for a High Resolution Mass Spectrometry Procedure after Data Independent Acquisition. *Anal Chem* **2018**, *90* (5), 3531-3536.
48. Brockbals, L.; Staeheli, S. N.; Gascho, D.; Ebert, L. C.; **Kraemer, T.**; Steuer, A. E., Time-Dependent Postmortem Redistribution of Opioids in Blood and Alternative Matrices. *J Anal Toxicol* **2018**, *42* (6), 365-374.

49. Brockbals, L.; Habicht, M.; Hajdas, I.; Galassi, F. M.; Ruhli, F. J.; **Kraemer, T.**, Untargeted metabolomics-like screening approach for chemical characterization and differentiation of canopic jar and mummy samples from Ancient Egypt using GC-high resolution MS. *Analyst* **2018**, *143* (18), 4503-4512.
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### **Oral contributions to conferences (talk or poster)**

In order to promote young scientists, lectures or posters are given at national and international congresses by my PhD students or post-docs. Thus, more than 50 talks or posters have been presented since 2016.

Only invited lectures or keynotes are held by me personally.

1. **Kraemer, T.:** Postmortem Toxicological analysis: principles and Interpretation; Invited keynote presentation at the EAPCCT ANNUAL CONGRESS in Basel, Switzerland, May **2017**
2. **Kraemer, T.:** Mass Spectrometry in Forensics; Invited keynote presentation at the European Mass Spectrometry Conference EMSC, Saarbrücken, Germany, March **2018**
3. **Kraemer, T.:** Sherlock Holmes meets Mass Spectrometry - It's elementary, my dear Watson!; Invited keynote presentation at the 20TH NORDIC CONFERENCE ON FORENSIC MEDICINE - Joint NCFM - NAFT Conference, Helsinki, Finland, June **2018**
4. **Kraemer, T.:** New Developments in Psychoactive Substances – The NPS Problem; Keynote Address, SST Meeting Basel, Switzerland, November **2018**
5. **Kraemer, T.:** Vegetarian Dogs, Drugged Fish, Poisoned Birds and Some Dead Guys - Mass Spectrometric Solutions in Forensics; keynote at the 17th Nordic Mass Spectrometry Conference, Espoo, Finland, August **2019**

### **Outreach activities (e.g. public engagement in science, technology and knowledge transfer activities, scientific art performances, etc.)**

- Guest lecture at the University of Konstanz, Germany, on mass spectrometry.
- Lectures for the public on the subject of drugs or poisons (e.g. Volkshochschule Zurich).
- Numerous lectures on the topic of drugs or detection of driving incapacity for police/prosecutors/lawyers (e.g. European Expert Meeting Drug Detection , St Ingbert, Germany; Symposium of the Police Technical Institute of the German Police University (PTI) in Frankfurt/M., Germany; Zurich Conference on Road Traffic Law
- Presentations at workshops on current topics in forensic toxicology (e.g. at TIAFT meetings in Boca Raton, USA and Ghent, Belgium; Specialty Diagnostix Symposium, Frankfurt, Germany)