

Nicole Strittmatter, PhD

Professor of Analytical Chemistry, Mass Spectrometry Expert

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Trained analytical chemist and mass spectrometry professional with over 10 years experience, 6 years of which were spent in pharmaceutical industry as mass spectrometry imaging expert. Main research focus on metabolomics, *in-situ* mass spectrometry, molecular imaging, and multimodal data integration.

Experience

10/2021 to present **Professor of Analytical Chemistry**

Faculty of Chemistry, Technical University of Munich, Germany



- Development of *in situ* mass spectrometric methods for the characterization of complex biological samples such as tissue sections and microbial biofilms, especially using ambient mass spectrometry, imaging mass spectrometry, high resolution mass spectrometry, multimodal analysis, metabolomics
- Teaching: modules CH0107 Analytical Chemistry (BWL, BSc 3rd Semester, 2SWS), CH4109 Fundamentals of Analytical Chemistry – Trace analysis (Chemistry, BSc 3rd Semester, 2SWS), CH3125 Lab Rotation Analytical Chemistry 2, elective MSC module Advanced Mass Spectrometry

06/2019 to 08/2021 **Associate Principal Scientist Mass Spectrometry Imaging**

AstraZeneca, Cambridge, UK



- Additional responsibilities involve increased role in project prioritisation, establishing internal and external collaborations, initiating and participating in grant proposals
- Identification and implementation of independent and impactful science projects

04/2015 to 05/2019 **Senior Scientist Mass Spectrometry Imaging**

AstraZeneca, Cambridge, UK.



- MSI support for pre-clinical and clinical studies within global AZ R&D
- Role involves initial communication with project leaders, cryosectioning, method development and data acquisition, data analysis, report writing and communicating data back to the project
- Technologies used include DESI Imaging on Orbitrap platform, MALDI-TOF, imaging mass cytometry, H&E, immunofluorescence microscopy, DESI-TQS
- Lead for imaging of nanomedicine drug delivery, focus on oncology
- Participation in workstreams for multimodal data registration and integration and new methodologies in imaging drug nanocarriers
- Leading an internal science engagement forum (>1 year) and establishing a cross-functional imaging in drug delivery discussion group
- 6-month secondment in DMPK group performing drug metabolite identification, quantification and structure elucidation

11/2011 to 03/2012

Research Assistant

*Institute for Inorganic and Analytical Chemistry,
Justus-Liebig University Gießen*



- Characterisation of the direct coupling of thin-film microextraction and desorption electrospray ionisation mass spectrometry for the application to wastewater matrices
- Comparison with LC-MS and SPE/LC-MS; *in-situ* experiments.

Education

2012-2016

Doctor of Philosophy

Department of Surgery and Cancer, Imperial College London



- Development of a rapid *in-situ* mass spectrometric profiling method for microorganisms and human cell lines based on Rapid Evaporative Ionisation Mass Spectrometry (REIMS)
- Generation and curation of spectral database, data analysis using multivariate statistical methods
- Culturing and handling of class 1 and 2 microbiological specimens (liquid and solid culture, aerobic and anaerobic), sterile working
- Identification of taxon-specific bacterial metabolites to identify microorganisms in human tissue and biofluid specimen
- DESI imaging of various murine and human tissue specimens with other PhD students and postdocs, researchers from other universities and pharmaceutical industry
- Managing and maintenance of DESI imaging capability and group's laboratory at Charing Cross Hospital

10/2009 to 09/2011

MSc in Chemistry

Justus-Liebig University Gießen, Germany



- Optional modules: Pollutants in the Environment, Chemistry of the Environment
- Advanced modules: Food Biotechnology, Analytical Methods in Life Sciences
- Specialisation Module: Proteomics and Toponomics
- Thesis topics:
 - Sampling and preparation of wastewater influent and effluent samples using thin-film microextraction (TFME)
 - Analysis of pharmaceuticals and personal care products using high-resolution DESI-MS
 - Development of a targeted LC-MS method for carbamazepine and triclosan for method validation

10/2006 to 10/2009

BSc in Chemistry

Justus-Liebig University Gießen, Germany



- Elective courses: Food Toxicology, Scientific Writing and Data Dissemination, Biotechnology of Sustainable Resources
- Thesis on characterisation of Special Inorganic Nanoscaled Dusts using differential scanning calorimetry, X-ray crystallography, thermogravimetric analysis and transmission electron microscopy.

Podium presentations

1. **Strittmatter N**, Ling S, Maglennon G, Nilsson A, Andren P, Paola Serra M, Hamm G, Wallez Y, Richards FM, Barry S, Jodrell DI, Lau A, Goodwin R. *Multimodal Mass Spectrometry Imaging to Understand Drug Delivery, Metabolism, Response And Resistance in Pancreatic Ductal Adenocarcinoma*. European Molecular Imaging Meeting 2019, Glasgow, UK (19-22 March 2019)
2. **Strittmatter N**, Kanvatirth P, Mastroeni P, Hamm G, Goodwin RJA. *Elucidating the effect of ciprofloxacin treatment for Salmonella enterica infection in an in vivo mouse model*. 66th Conference of the American Society of Mass Spectrometry 2018 (ASMS), San Diego, CA, USA (June 3-7, 2018)
3. **Strittmatter N**, Bokobza S, Smith N, Goodwin RJA. *Detection of docetaxel and its distribution in prostate tumour xenografts by desorption electrospray ionisation mass spectrometry*. Imaging Mass Spectrometry Conference 2016 (OurConIV), Ustron, Poland (October 17-21, 2016)
4. **Strittmatter N**, McKenzie J, Speller AVM, Burke A, Pruski P, Mirnezami R, Marchesi J, Rebec M, Takats Z. *Qualitative and quantitative detection of bacteria in complex human matrices using taxon-specific markers*. The International Chemical Congress of Pacific Basin Societies 2015 (PacifiChem 2015), Honolulu, Hawaii, USA (December 15-20, 2015)
5. **Strittmatter N**, McKenzie J, Speller AVM, Burke A, Mirnezami R, Marchesi J, Rebec M, Takats Z. *Taxon-specific markers for the qualitative and quantitative detection of bacteria in human tissue samples*. 12th EMSG Ardgour Symposium 2015, Edinburgh, UK (November 16-20, 2015)
6. **Strittmatter N**, Swales JG, Cobice D, Webborn P, Goodwin RJA. *Desorption Electrospray Ionisation Mass Spectrometry Imaging of pharmaceutical formulations in pre-clinical tumour models*. Imaging Mass Spectrometry Conference 2015 (OurConIII), Pisa, Italy (October 27-29, 2015)
7. **Strittmatter N**, Goodwin RJA, Swales JG, Nilsson A, Andren PE, Takats Z, Ashton S, Jewsbury PJ, Pease E, Webborn P, Barry ST. *Analysis of nanoparticle-formulated anti-tumour drugs in preclinical models using multimodal mass spectrometry imaging*. Annual Conference of the British Mass Spectrometry Society (BMSS 2015), Birmingham, UK (September 15-17, 2015)
8. **Strittmatter N**, McKenzie J, Burke A, Rickards T, Rebec M, Takats Z. *Taxon-specific markers for the qualitative and quantitative detection of bacteria in human samples*. Mass Spectrometry: Applications to the Clinical Lab Meeting 2015 (MSACL 2015 US), San Diego, CA, USA (March 28 - April 1, 2015)
Young Investigator Travel Grant Awarded.
9. **Strittmatter N**, Rebec M, Jones EA, Golf O, Abdolrasouli A, Balog J, Behrends V, Veselkov KA, Takats Z. *Rapid Characterization and Identification of Clinically Relevant Microorganisms Using Rapid Evaporative Ionization Mass Spectrometry*. Applications to the Clinical Lab Meeting 2014 (MSACL 2014 EU), Salzburg, Austria (September 2-5, 2014)
Young Investigator Travel Grant Awarded.
10. **Strittmatter N**, Lovrics A, Jones EA, Golf O, Veselkov KA, Szakacs G, Takats Z. *Characterisation of Human Cell Lines Using Rapid Evaporative Ionization Mass Spectrometry*. International Mass Spectrometry Conference 2014, Geneva, Switzerland (August 24-29, 2014)
11. **Strittmatter N**, Takats Z. *From TFME-DESI MS to in-vivo analysis using REIMS: Applications of ambient mass spectrometry to biological samples*. 11th EMSG Ardgour Symposium 2014, Ardgour, UK (September 8-12, 2014)
12. **Strittmatter N**, Jones EA, Rebec M, Takats Z. *Identification of bacteria using rapid evaporative ionisation mass spectrometry*. 61st Conference of the American Society of Mass Spectrometry 2013 (ASMS), Minneapolis, MN, USA (June 9-13, 2013)

Upcoming

13. **Strittmatter N**, Moss JI, Race AM, Sutton D, Rodriguez Canales J, Ling S, Wong E, Wilson J, Smith A, Howes C, Bunch J, Barry ST, Goodwin RJA, Ashford MB. *Understanding nanomedicine distribution using multimodal molecular imaging*. 17th European Molecular Imaging Meeting 2022 (EMIM), Thessaloniki, Greece (March 15-18, 2022)

Additional Information

Language Skills	native German, fluent English, basic French, qualification in Latin
Scientific Engagement	Ad-hoc reviewer for Nature Scientific Reports, Rapid Communications in Mass Spectrometry, Clinical Applications, Journal of Mass Spectrometry & Advances in the Clinical Lab Section Editor Imaging, Journal of Mass Spectrometry & Advances in the Clinical Lab (since Dec 2020) Reviewer Category "Image-guided Drug Delivery" for the EMIM 2022 (15-18 March, Thessaloniki, Greece) Conference of the European Society for Molecular Imaging Invited Book Review for Analytical and Bioanalytical Chemistry (in preparation)
Memberships	European Society for Molecular Imaging (ESMI) Deutsche Gesellschaft für Massenspektrometrie (DGMS) Gesellschaft Deutscher Chemiker (GDCh), Fachgruppe Analytik
Professional interests I would like to develop	Coding (R), Chromatography, Protein Analysis

List of Publications

>40 publications since 2012, 10 first author publications, >1200 citations, h-index: 22 (source Scopus, 01.02.2022)

Manuscripts

1. **Strittmatter N**, Duering RA, Takats Z, Analysis of wastewater samples by direct combination of thin-film microextraction and desorption electrospray ionization mass spectrometry. *Analyst* **2012**, 137(17), 4037-4044. DOI: 10.1039/C2AN35411J
2. **Strittmatter N**, Jones EA, Veselkov KA, Rebec M, Bundy JG, Takats Z. Analysis of intact bacteria using rapid evaporative ionisation mass spectrometry. *Chemical Communications* **2013**, 49(55):6188-90. DOI: 10.1039/c3cc42015a
3. **Strittmatter N**, Rebec M, Jones EA, Golf O, Abdolrasouli A, Balog J, Behrends V, Veselkov KA, Takats Z. Characterization and identification of clinically relevant microorganisms using rapid evaporative ionization mass spectrometry. *Analytical Chemistry* **2014**, 86(13): 6555-62. DOI: 10.1021/ac501075f
4. Swales JG, Tucker JW, **Strittmatter N**, Nilsson A, Cobice D, Clench MR, Mackay CL, Andren PE, Takáts Z, Webborn PJ. Mass spectrometry imaging of cassette-dosed drugs for higher throughput pharmacokinetic and biodistribution analysis. *Analytical Chemistry* **2014**, 86(16): 8473-80. DOI: 10.1021/ac502217r
5. Veselkov KA, Mirnezami R, **Strittmatter N**, Goldin RD, Kinross J, Speller AVM, Abramov T, Jones EA, Darzi A, Holmes E, Nicholson JK, Takats Z. Chemo-informatic strategy for imaging mass spectrometry-based hyperspectral profiling of lipid signatures in colorectal cancer. *Proceedings of the National Academy of Sciences of the United States of America* **2014**, 111(3): 1216-21. DOI: 10.1073/pnas.1310524111
6. Abbassi-Ghadi N, Veselkov KA, Kumar S, Huang J, Jones EA, **Strittmatter N**, Kudo H, Goldin RD, Takáts Z, Hanna GB. Discrimination of lymph node metastases using desorption electrospray ionisation-mass spectrometry imaging. *Chemical Communications* **2014**, 50(28): 3661-4. DOI: 10.1039/c3cc48927b
7. Liebeke M, **Strittmatter N**, Fearn S, Morgan AJ, Kille P, Fuchser J, Wallis D, Palchykov V, Robertson J, Lahive E, Spurgeon DJ, McPhail D, Takats Z, Bundy JG. Unique metabolites protect earthworms against plant polyphenols. *Nature Communications* **2015**, DOI: 10.1038/ncomms8869
8. Inglese P, **Strittmatter N**, Doria ML, Mroz AK, Speller AVM, Poynter L, Dannhorn A, Kudo H, Mirnezami R, Goldin RD, Nicholson JK, Takats Z, Glen RC. Network analysis of mass spectrometry imaging data from colorectal cancer identifies key metabolites common to metastatic development. *bioRxiv* **2018**. DOI: <https://doi.org/10.1101/230052>
9. Golf O, **Strittmatter N**, Karancsi T, Pringle SD, Speller AV, Mroz A, Kinross JM, Abbassi-Ghadi N, Jones EA, Takats Z. Rapid evaporative ionization mass spectrometry imaging platform for direct mapping from bulk tissue and bacterial growth media. *Analytical Chemistry* **2015**, 87(5): 2527-34. DOI: 10.1021/ac5046752
10. Abbassi-Ghadi N, Jones EA, Veselkov KA, Huang J, Kumar S, **Strittmatter N**, Golf O, Kudo H, Goldin RD, Hanna GB, Takats Z. Repeatability and reproducibility of desorption electrospray ionization-mass spectrometry (DESI-MS) for the imaging analysis of human cancer tissue: a gateway for clinical applications. *Analytical Methods* **2015**, 7: 71-80. DOI: 10.1039/C4AY01770F

11. Guenther S, Muirhead LJ, Speller AV, Golf O, **Strittmatter N**, Ramakrishnan R, Goldin RD, Jones EA, Veselkov K, Darzi A, Takats Z. Spatially resolved metabolic phenotyping of breast cancer by desorption electrospray ionization mass spectrometry. *Cancer Research* **2015**. DOI: 10.1158/0008-5472.CAN-14-2258
12. Oetjen J, Veselkov K, Watrous J, McKenzie JS, Becker M, Hauberg-Lotte L, Kobarg JH, **Strittmatter N**, Mróz AK, Hoffmann F, Trede D, Palmer A, Schiffler S, Steinhorst K, Aichler M, Goldin R, Guntinas-Lichius O, von Eggeling F, Thiele H, Maedler K, Walch A, Maass P, Dorrestein PC, Takats Z, Alexandrov T. Benchmark datasets for 3D MALDI- and DESI-imaging mass spectrometry. *GigaScience* **05/2015**. DOI: 10.1186/s13742-015-0059-4
13. Swales JG, **Strittmatter N**, Tucker JW, Clench MR, Webborn PJH, Goodwin RJA. Spatial Quantitation of Drugs in tissues using Liquid Extraction Surface Analysis Mass Spectrometry Imaging. *Scientific Reports* **2016**, 6, 37648. DOI: 10.1038/srep37648
14. Ashton S, Song YH, Nolan J, Cadogan E, Murray J, Odedra R, Foster J, Hall P, Low S, Taylor P, Ellston R, Polanska U, Wilson J, Howes C, Smith A, Goodwin RJA, Swales JG, **Strittmatter N**, Takáts Z, Nilsson A, Andren P, Trueman D, Walker M, Reimer CL, Troiano G, Parsons D, De Witt D, Ashford M, Hrkach J, Zale S, Jewsbury S, Barry ST. Aurora kinase inhibitor nanoparticles target tumors with favorable therapeutic index in vivo. *Science Translational Medicine* **2016**, 325(8), p325ra17. DOI: 10.1126/scitranslmed.aad2355
15. **Strittmatter N** and Lovrics A, Sessler J, McKenzie JS, Kucsma N, Szakacs G, Takats Z. Shotgun Lipidomic Characterization of the NCI60 Cell Line Panel Using Rapid Evaporative Ionization Mass Spectrometry. *Analytical Chemistry* **2016**, 88 (15), 7507–7514. DOI: 10.1021/acs.analchem.6b00187*
16. Shariatgorji M and **Strittmatter N**, Nilsson A, Källback P, Alvarsson A, Zhang X, Vallianatou T, Svenningsson P, Goodwin RJA, Andren PE. Simultaneous imaging of multiple neurotransmitters and neuroactive substances in the brain by desorption electrospray ionization mass spectrometry. *NeuroImage* **2016**, 136, 129-138. DOI: 10.1016/j.neuroimage.2016.05.004*
17. Abbassi-Ghadi N, Golf O, Kumar S, Antonowicz SSA, McKenzie JS, Huang J, **Strittmatter N**, Kudo H, Jones EA, Veselkov KA, Goldin RD, Hanna GB, Takats Z. Imaging of Esophageal Lymph Node Metastases by Desorption Electrospray Ionization Mass Spectrometry. *Cancer Research* **2016**, 76(19), 5647-5656. DOI: 10.1158/0008-5472.CAN-16-0699
18. Dória ML, McKenzie JS, Mroz AK, Phelps DL, Speller AVM, Rosini F, **Strittmatter N**, Golf OH, Veselkov KA, Brown R, Ghaem-Maghami S, Takats Z. Epithelial ovarian carcinoma diagnosis by desorption electrospray ionization mass spectrometry imaging. *Scientific Reports* **2016**, 6, 39219. DOI: 10.1038/srep39219
19. England RM, Hare JI, Barnes J, Wilson J, Smith A, **Strittmatter N**, Kemmitt PD, Waring MJ, Barry ST, Alexander C, Ashford MB. Tumour regression and improved gastrointestinal tolerability from controlled release of SN-38 from novel polyoxazoline-modified dendrimers. *Journal of Controlled Release* **2017**, 247, 73–85. DOI: 10.1016/j.jconrel.2016.12.034
20. Hulme HE, Meikle LM, Wessel H, **Strittmatter N**, Swales J, Thomson C, Nilsson A, Nibbs RJB, Milling S, Andren PE, Mackay CL, Dexter A, Bunch J, Goodwin RJA, Burchmore R and Wall DM. Mass spectrometry imaging identifies palmitoylcarnitine

as an immunological mediator during *Salmonella* Typhimurium infection. *Scientific Reports* **2017**, 7, 2786. DOI: 10.1038/s41598-017-03100-5

21. Galea D, Inglese P, Cammack L, **Strittmatter N**, Rebec M, Mirnezami R, Laponogov I, Kinross J, Nicholson JK, Takats Z & Veselkov KA. Translational utility of a hierarchical classification strategy in biomolecular data analytics. *Scientific Reports* **2017**, 7, 14981. DOI: 10.1038/s41598-017-14092-7
22. Swales JG, Dexter A, Hamm G, Nilsson A, **Strittmatter N**, Michopoulos F, Hardy C, Morentin-Gutierrez P, Mellor M, Andren PE, Clench MR, Bunch J, Critchlow SE, Goodwin RJA. Quantitation of endogenous metabolites in mouse tumors using mass-spectrometry imaging, *Analytical Chemistry* **2018**, 90(10), 6051-6058. DOI: 10.1021/acs.analchem.7b05239
23. Vallianatou T, **Strittmatter N**, Nilsson A, Shariatgorji M, Hamm G, Pereira M, Källback P, Svenningsson P, Karlgren M, Goodwin RJA, Andren P. A mass spectrometry imaging approach for investigating how drug-drug interactions influence drug blood-brain barrier permeability. *Neuroimage* **2018**, 172, 808-816. DOI: 10.1016/j.neuroimage.2018.01.013
24. Bäckström E, Hamm G, Nilsson A, Fihn BM, **Strittmatter N**, Andrén P, Goodwin RJA, Fridén M. Uncovering the regional localization of inhaled salmeterol retention in the lung, *Drug Delivery* **2018**, 25(1), 838-845. DOI: 10.1080/10717544.2018.1455762
25. Varshavi D, Scott FH, Varshavi D, Veeravalli S, Phillips IR, Veselkov K, **Strittmatter N**, Takats Z, Shephard EA, Everett JR. Metabolic biomarkers of ageing in C57BL/6J wild-type and flavin-containing monooxygenase 5 (FMO5)-knockout mice. *Frontiers in Molecular Biosciences* **2018**, 5, 28. DOI: 10.3389/fmolb.2018.00028
26. Davison AS and **Strittmatter N**, Sutherland H, Hughes AT, Hughes J, Bou-Gharios G, Milan AM, Goodwin RJA, Ranganath LR, Gallagher JA. Assessing the effect of nitisinone induced hypertyrosinaemia on monoamine neurotransmitters in brain tissue from a murine model of alkaptonuria using mass spectrometry imaging. *Metabolomics* **2019**, 15(5), 68. DOI: 10.1007/s11306-019-1531-4*
27. Hulme H, Meikle LM, **Strittmatter N**, van der Hooft JJJ, Swales J, Bragg RA, Villar VH, Ormsby M, Barnes S, Brown SL, Dexter A, Kamat MT, Komen JC, Walker D, Milling S, Osterweil E, MacDonald AS, Schofield CJ, Tardito S, Bunch J, Douce G, Edgar JM, Edrada-Ebel R, Goodwin RJA, Burchmore R, Wall DM, Microbiome-derived carnitine mimics as novel mediators of gut-brain axis communication. *Science Advances* **2020**, 6(11), eaax6328. DOI: 10.1126/sciadv.aax6328
28. Moss JI, Barjat H, Emmas SA, **Strittmatter N**, Maynard J, Goodwin RJA, Storm G, Lammers T, Puri S, Ashford MB, Barry ST. High-resolution 3D visualization of nanomedicine distribution in tumors. *Theranostics* **2020**, 10(2), 880-897. DOI: 10.7150/thno.37178
29. Hamm GR, Bäckström E, Brülls M, Nilsson A, **Strittmatter N**, Andrén PE, Grime K, Fridén M, Goodwin RJA. Revealing the Regional Localization and Differential Lung Retention of Inhaled Compounds by Mass Spectrometry Imaging. *Journal of Aerosol Medicine and Pulmonary Drug Delivery*, **2020**, 33(1), 43-53. DOI: 10.1089/jamp.2019.1536
30. Abbassi-Ghadi N, Antonowicz S, McKenzie J, Kumar S, Huang J, Jones E, **Strittmatter N**, Petts G, Kudo H, Court S, Hoare J, Veselkov K, Goldin R, Takáts Z,

Hanna G. De novo lipogenesis alters the phospholipidome of esophageal adenocarcinoma. *Cancer Research* **2020**, *80*(13), 2764-2774, DOI: 10.1158/0008-5472.CAN-19-4035

31. Dannhorn A, Kazanc E, Ling S, Nikula C, Karali E, Serra MP, Vorng JL, Inglese P, Maglennon G, Hamm G, Swales J, **Strittmatter N**, Pouligiannis G, Bunch J, Goodwin RJA, Takats Z. Universal sample preparation unlocking multimodal molecular tissue imaging, *Analytical Chemistry* **2020**, *92*(16), 11080-11088, DOI: 10.1021/acs.analchem.0c00826
32. Shariatgorji R, Nilsson A, **Strittmatter N**, Vallianatou T, Zhang X, Svenningsson P, Goodwin R, Andrén PE. Bromopyrylium derivatization facilitates identification by mass spectrometry imaging of monoamine neurotransmitters and small molecule neuroactive compounds. *Journal of the American Society of Mass Spectrometry* **2020**, *31*(12), 2553-2557, DOI: 10.1021/jasms.0c00166
33. Colclough N, Chen K, Johnstöm P, **Strittmatter N**, Yan Y, Wrigley GL, Schou M, Goodwin R, Varnäs K, Adua S, Zhao M, Nguyen DX, Maglennon G, Barton P, Atkinson J, Han L, Zhang D, Zhang Z, Janefeldt A, Wilson J, Smith A, Takano A, Arakawa R, Kondrashov M, Malmquist J, Revunov E, Vazquez-Romero A, Mahdi Moein M, Windhorst AD, Karp NA, Finlay MRV, Ward R, Yates JWT, Smith P, Farde L, Cross DAE. Preclinical comparison of the blood brain barrier (BBB) permeability of osimertinib with other EGFR TKIs. *Clinical Cancer Research* **2021**, *27*(1), 189-201. DOI: 10.1158/1078-0432.CCR-19-1871
34. Dannhorn A, Ling S, Powell S, McCall E, Maglennon G, Jones G, Pierce A, **Strittmatter N**, Hamm G, Barry S, Bunch J, Goodwin R, Takats Z. Evaluation of UV-C decontamination of clinical tissue sections for spatially resolved analysis by mass spectrometry imaging (MSI). *Analytical Chemistry* **2021**, *93*(5), 2767-2775. DOI: 10.1021/acs.analchem.0c03430
35. Race AM, Sutton D, Hamm G, Maglennon G, Morton JP, **Strittmatter N**, Campbell A, CRUK Grand Challenge Rosetta Consortium, Sansom OJ, Wang Y, Barry ST, Bunch J, Goodwin RJA. Deep learning-based annotation transfer between molecular imaging modalities: A route to multi-modal data integration. *Analytical Chemistry* **2021**, *93*(6), 3061-3071. DOI: 10.1021/acs.analchem.0c02726
36. **Strittmatter N**, England R, Moss J, Race AM, Sutton D, Maglennon G, Ling S, Wong E, Rose J, McDonald R, Jones S, Ashford M, Goodwin RJA. Method to investigate the distribution of water-soluble compounds in fresh frozen tissues using imaging mass cytometry, *Analytical Chemistry* **2021**, *93*, 8, 3742-3749. DOI: 10.1021/acs.analchem.0c03908[†]
37. Shariatgorji R, Nilsson A, Fridjonsdottir E, **Strittmatter N**, Dannhorn A, Svenningsson P, Goodwin RJA, Odell L, Andrén PE. Spatial visualization of comprehensive brain neurotransmitter systems and neuroactive substances by selective in situ chemical derivatization mass spectrometry imaging. *Nature Protocols* **2021**, *16*, 3298-3321. DOI: 10.1038/s41596-021-00538-w.
38. Hulme H, Meikle LM, **Strittmatter N**, Swales J, Hamm G, Brown SL, Milling S, MacDonald AS, Goodwin RJA, Burchmore B, Wall D. Mapping the influence of the gut microbiota on small molecules in the brain through mass spectrometry imaging.

BioRxiv **2020**, DOI: 10.1101/2020.03.13.987164 (under revision at *Journal of the American Society of Mass Spectrometry*)

39. Ormsby MJ, Hulme H, Villar VH, Hamm G, Rodriguez-Blanco G, Bragg RA, **Strittmatter N**, Schofield CJ, Delles C, Salt IP, Tardito S, Burchmore R, Goodwin RJA, Wall DM. Microbiome-derived metabolites reproduce the mitochondrial dysfunction and decreased insulin sensitivity observed in type 2 diabetes, *bioRxiv* **2020**, DOI: 10.1101/2020.08.02.232447.
40. **Strittmatter N** and Kanvatirth P, Inglese P, Race AM, Nilsson A, Dannhorn A, Ling S, Wong E, Seeliger F, Serra MP, Hoffmann S, Maglennon G, Atkinson J, Jones S, Hamm G, Bunch J, Andren P, Takats Z, Goodwin R, Mastroeni P. Studying the effects of *Salmonella typhimurium* infection and ciprofloxacin treatment using mass spectrometry imaging, *Journal of the American Society of Mass Spectrometry* **2021**, 32, 12, 2791–2802. DOI:10.1021/jasms.1c00240*†
41. **Strittmatter N** and Richards FM, Race AM, Ling S, Sutton D, Nilsson A, Wallez Y, Barnes J, Maglennon G, Gopinathan A, Brais R, Wong E, Serra MP, Atkinson J, Smith A, Wilson J, Hamm G, Johnson TI, Dunlop CR, Kaistha BP, Andren PE, Lau A, Barry ST, Jodrell DI, Goodwin RJA. Method To Visualize the Intratumor Distribution and Impact of Gemcitabine in Pancreatic Ductal Adenocarcinoma by Multimodal Imaging, *Analytical Chemistry* **2022**, 94(3), 1795-1803. DOI: 10.1021/acs.analchem.1c04579*†
42. **Strittmatter N**, Moss JI, Race AM, Sutton D, Rodriguez Canales J, Ling S, Wong E, Wilson J, Smith A, Howes C, Bunch J, Barry ST, Goodwin RJA, Ashford MB. Understanding nanomedicine distribution using multimodal molecular imaging, *Theranostics* **2022**, 12(5):2162-2174. DOI:10.7150/thno.68000
43. Taylor AJ, Burton A, Campbell AD, Dexter A, Elia E, Fu T, Hamm G, Murta T, Neihaus M, Nikula C, Race AM, Robinson KN, Steven RT, **Strittmatter N**, Thomas SA, Wu V, Yan B, Barry ST, Goodwin RJA, Samson OJ, Takats Z, Yuneva M, Bunch J. Broad molecular coverage of lipids and metabolites in MALDI and DESI mass spectrometry imaging of pancreatic ductal adenocarcinoma (in preparation, *Anal. Chem.*)
44. Adua AJ, Arnal-Estape A, Zhao M, Qi B, Liu ZZ, Kravitz C, Hulme H, **Strittmatter N**, Lopez-Giraldez F, Albert AE, Melnick M, Politi K, Chiang V, Colclough N, Goodwin RJA, Smith P, Cross D, Nguyen DX. Brain Metastatic Outgrowth and Osimertinib Resistance are linked via RhoA in EGFR mutant Lung Cancer (in preparation)
45. Dannhorn A, Kazanc E, Hamm G, Swales J, **Strittmatter N**, Maglennon G, Goodwin RJA, Takats Z. Correlating mass spectrometry imaging and liquid chromatography-tandem mass spectrometry for tissue-based pharmacokinetic studies. *Metabolites* (under review)
46. Illes-Toth E, Hale OJ, Hughes JW, **Strittmatter N**, Rose J, Clayton B, Sargeant R, Jones S, Dannhorn A, Goodwin RJA, Cooper HJ. In situ detection and imaging of a non-covalent protein-drug complex in tissue from orally-dosed rats (*Angewandte Chemie Int. Ed.*, submitted)

* Shared first authorship, † corresponding authorship

Book Chapters

Takats Z, **Strittmatter N**, McKenzie JS. Advances in Cancer Research Volume 134, Applications of Mass Spectrometry Imaging to Cancer. Chapter 9: Ambient Mass Spectrometry in Cancer Research. Edited by Drake RR and McDonnell LA. 201