

PRIV.-DOZ. MAG.PHARM. DR.RER.NAT. OLIVER LANGER

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Research Interests

Preclinical and clinical PET, radiochemistry, radiopharmacology, clinical pharmacokinetics, ADME, drug transporters

Education and Career History

2010 - present Senior Scientist at AIT Austrian Institute of Technology GmbH
2006 - 2010 Research associate at Austrian Research Centers GmbH, Seibersdorf (now: AIT Austrian Institute of Technology GmbH)
2006 Associate Professor ("Privatdozent"), Medical University of Vienna
2002 - present Research associate at the Department of Clinical Pharmacology, Medical University of Vienna
1996 - 2000 PhD thesis, Department of Clinical Neurosciences, Karolinska Institutet, Stockholm, Sweden, supported by a research fellowship from the EU
1996 - 1998 Research fellow, CEA, Service Hospitalier Frédéric Joliot, Orsay, France
1993 Master thesis, Department of Clinical Neurosciences, Karolinska Institutet, Stockholm, Sweden, supported by a research fellowship from the Austrian Ministry of Science
1989 - 1995 University of Vienna (Master of Pharmacy)

Invited lectures (5 selected):

2011 7th BioMedical Transporters Conference "Membrane Transporters in Drug Discovery", Grindelwald, Switzerland
2013 Gordon Research Conference "Multi-Drug Efflux Systems", Ventura, California, USA
2014 Gordon Research Conference "Barriers of the CNS", New London, New Hampshire, USA
2014 Experimental Biology, San Diego, California, USA
2015 Society of Nuclear Medicine and Molecular Imaging Annual Meeting, Baltimore, USA

Honors:

2003 THP-ÖGN Award for Natural Scientists in Nuclear Medicine, Austrian Society of Nuclear Medicine
2005 Hans-Horst-Meyer-Award, Austrian Pharmacological Society

Ad-Hoc Reviewer (5 selected):

J. Nucl. Med., Eur. J. Nucl. Med. Mol. Imaging, NeuroImage, Bioorg. Med. Chem., Mol. Pharm.

Memberships:

Austrian Pharmacological Society (APHAR), Austrian Society for Nuclear Medicine (ÖGN), American Society for Pharmacology and Experimental Therapeutics (ASPET)

Sources of funding (5 selected)

2015 - 2018	FWF, Austria	"Influence of ABCG2 SNP on brain distribution of ABCG2 substrates"	173,600 €
2014 - 2017	FWF, Austria	"PET imaging to assess BBB function in AD"	319,000 €
2012 - 2013	FWF, Austria	"Species differences in Pgp function at the BBB"	83,888 €
2008 - 2012	FP7, EU	"Euripides"	745,000 €
2005 - 2006	OeNB, Austria	"Combined PET and microdialysis "	45,000 €

Collaboration partners (outside Vienna; 5 selected)

Wolfgang Löscher University of Veterinary Medicine Hannover, Germany

Marie-Claude Asselin	The University of Manchester, UK
Jens Pahnke	University of Oslo, Germany
Bruno Stieger	University Hospital Zurich, Switzerland
Nicolas Tournier	CEA, SHFJ, IMIV, Orsay, France

Publication list (1997-2015, * corresponding author)

First, senior or corresponding author:

Original research articles:

1. Thomas Wanek, Emina Halilbasic, Michele Visentin, Severin Mairinger, Kerstin Römermann, Bruno Stieger, Claudia Kuntner, Markus Müller, Oliver Langer*, Michael Trauner. Influence of 24-nor-ursodeoxycholic acid on hepatic disposition of [¹⁸F]ciprofloxacin, a positron emission tomography study in mice. In press_J Pharm Sci (2015)
2. Alexander Traxl, Thomas Wanek, Severin Mairinger, Johann Stanek, Thomas Filip, Michael Sauberer, Markus Müller, Claudia Kuntner, Oliver Langer*. Breast cancer resistance protein and p-glycoprotein influence in vivo disposition of ¹¹C-erlotinib. In press_J Nucl Med (2015) DOI: jnumed.115.161273.
3. Severin Mairinger, Johann Stanek, Thomas Wanek, Oliver Langer*, Claudia Kuntner. Automated electrophilic radiosynthesis of [¹⁸F]FBPA using a modified nucleophilic GE TRACERlab FX_{FDG}. Appl Radiat Isotop 104:124-127 (2015)
4. Thomas Wanek, Kerstin Römermann, Severin Mairinger, Johann Stanek, Michael Sauberer, Thomas Filip, Alexander Traxl, Claudia Kuntner, Jens Pahnke, Florian Bauer, Thomas Erker, Wolfgang Löscher, Markus Müller, Oliver Langer*. Factors governing P-glycoprotein-mediated drug-drug interactions at the blood-brain barrier measured with positron emission tomography. Molecular Pharmaceutics 12(9):3214-3225 (2015)
5. Johann Stanek, Severin Mairinger, Thomas Wanek, Claudia Kuntner, Markus Müller, Oliver Langer*. Automated radiosynthesis of [¹⁸F]ciprofloxacin. Appl Radiat Isotop 99:133-137 (2015)
6. Thomas Wanek, Alexander Traxl, Jens P Bankstahl, Marion Bankstahl, Michael Sauberer, Oliver Langer*, Claudia Kuntner. [¹⁸F]FDG is not transported by P-glycoprotein and breast cancer resistance protein at the rodent blood-brain barrier. Nucl Med Biol 42:585-589 (2015)
7. Martin Bauer, Rudolf Karch, Markus Zeitlinger, Cécile Philippe, Kerstin Römermann, Johann Stanek, Alexandra Maier-Salamon, Wolfgang Wadsak, Walter Jäger, Marcus Hacker, Markus Müller, Oliver Langer*. Approaching complete inhibition of P-glycoprotein at the human blood-brain barrier: an (R)-[¹¹C]verapamil PET study. J Cereb Blood Flow Metab 35:743-746 (2015)
8. Martin Bauer, Rudolf Karch, Markus Zeitlinger, Joan Liu, Matthias J Koepp, Marie-Claude Asselin, Sanjay M Sisodiya, Johannes A Hainfellner, Wolfgang Wadsak, Markus Mitterhauser, Markus Müller, Ekaterina Pataraiia, Oliver Langer*. In vivo P-glycoprotein function before and after epilepsy surgery. Neurology 83:1326-31 (2014)
9. Kerstin Römermann, Thomas Wanek, Marion Bankstahl, Jens P Bankstahl, Maren Fedrowitz, Markus Müller, Wolfgang Löscher, Claudia Kuntner, Oliver Langer*. (R)-[¹¹C]verapamil is selectively transported by murine and human P-glycoprotein, and not MRP1 and BCRP at the blood-brain barrier. Nucl Med Biol 40(7):873-878 (2013)
10. Martin Bauer, Rudolf Karch, Markus Zeitlinger, Johann Stanek, Cécile Philippe, Wolfgang Wadsak, Markus Mitterhauser, Walter Jäger, Helmuth Haslacher, Markus Müller, Oliver Langer*. Interaction of ¹¹C-tariquidar and ¹¹C-elacridar with P-glycoprotein and breast

- cancer resistance protein at the human blood-brain barrier. *J Nucl Med* 54(8):1181-1187 (2013)
11. Florian Bauer, Thomas Wanek, Severin Mairinger, Johann Stanek, Michael Sauberer, Claudia Kuntner, Zahida Parveen, Peter Chiba, Markus Müller, Oliver Langer*, Thomas Erker. Interaction of HM30181 with P-glycoprotein at the murine blood-brain barrier assessed with positron emission tomography. *Eur J Pharmacol* 696(1-3):18-27 (2012)
 12. Severin Mairinger, Thomas Wanek, Claudia Kuntner, Yaprak Doenmez, Sabine Strommer, Johann Stanek, Elena Capparelli, Peter Chiba, Markus Müller, Nicola A. Colabufo, Oliver Langer*. Synthesis and preclinical evaluation of the radiolabeled P-glycoprotein inhibitor [¹¹C]MC113. *Nucl Med Biol* 39(8):1219-1225 (2012)
 13. Thomas Wanek, Claudia Kuntner, Jens P. Bankstahl, Severin Mairinger, Marion Bankstahl, Johann Stanek, Michael Sauberer, Thomas Filip, Thomas Erker, Markus Müller, Wolfgang Löscher, Oliver Langer*. A novel PET protocol for visualization of breast cancer resistance protein function at the blood-brain barrier. *J Cereb Blood Flow Metab* 32(11):2002-2011 (2012)
 14. Severin Mairinger, Jens P. Bankstahl, Claudia Kuntner, Kerstin Römermann, Marion Bankstahl, Thomas Wanek, Johann Stanek, Wolfgang Löscher, Markus Müller, Thomas Erker, Oliver Langer. The antiepileptic drug mephobarbital is not transported by P-glycoprotein or multidrug resistance protein 1 at the blood-brain barrier: a positron emission tomography study. *Epilepsy Res* 100 (1-2):93-103 (2012)
 15. Thomas Wanek, Claudia Kuntner, Jens P. Bankstahl, Marion Bankstahl, Johann Stanek, Michael Sauberer, Severin Mairinger, Sabine Strommer, Volker Wachek, Wolfgang Löscher, Thomas Erker, Markus Müller, Oliver Langer*. A comparative small-animal PET evaluation of [¹¹C]tariquidar, [¹¹C]elacridar and (R)-[¹¹C]verapamil for detection of P-glycoprotein expressing murine breast cancer. *Eur J Nucl Med Mol Imaging* 39(1):149-159 (2012)
 16. Martin Bauer, Markus Zeitlinger, Rudolf Karch, Peter Matzneller, Johann Stanek, Walter Jäger, Michaela Böhmendorfer, Wolfgang Wadsak, Markus Mitterhauser, Jens P. Bankstahl, Wolfgang Löscher, Matthias Koepf, Claudia Kuntner, Markus Müller, Oliver Langer. Pgp-mediated interaction between (R)-[¹¹C]verapamil and tariquidar at the human blood-brain barrier: a comparison with rat data. *Clin Pharmacol Ther* 91(2):227-233 (2012)
 17. Bernd Dörner, Claudia Kuntner, Jens P. Bankstahl, Thomas Wanek, Marion Bankstahl, Johann Stanek, Julia Müllauer, Florian Bauer, Severin Mairinger, Wolfgang Löscher, Donald W. Miller, Peter Chiba, Markus Müller, Thomas Erker, Oliver Langer. Radiosynthesis and in vivo evaluation of 1-[¹⁸F]fluoroelacridar as a positron emission tomography tracer for P-glycoprotein and breast cancer resistance protein. *Bioorg Med Chem* 19(7):2190-2198 (2011)
 18. Claudia Kuntner, Thomas Wanek, Martin Hoffer, Daniel Dangl, Margit Hornof, Herbert Kvaternik, Oliver Langer. Radiosynthesis and assessment of ocular pharmacokinetics of ¹²⁴I-labeled chitosan in rabbits using small-animal positron emission tomography. *Mol Imaging Biol* 13(2): 222-226 (2011)
 19. Claudia C Wagner, Marie Simpson, Markus Zeitlinger, Martin Bauer, Rudolf Karch, Aiman Abraham, Thomas Feurstein, Matthias Schütz, Kurt Kletter, Markus Müller, Graham Lappin, Oliver Langer. A combined accelerator mass spectrometry-positron emission tomography human microdose study with ¹⁴C- and ¹¹C-labelled verapamil. *Clin Pharmacokin* 50(2): 111-20 (2011)
 20. Florian Bauer, Claudia Kuntner, Jens P. Bankstahl, Thomas Wanek, Marion Bankstahl, Johann Stanek, Severin Mairinger, Bernd Dörner, Wolfgang Löscher, Markus Müller, Thomas Erker, Oliver Langer. Synthesis and in vivo evaluation of [¹¹C]tariquidar, a PET radiotracer based on a third-generation P-gp inhibitor. *Bioorg Med Chem* 18(15):5489-5497 (2010)
 21. Severin Mairinger, Oliver Langer*, Claudia Kuntner, Thomas Wanek, Jens Bankstahl, Marion Bankstahl, Johann Stanek, Bernd Dörner, Florian Bauer, Christoph Baumgartner,

- Wolfgang Löscher, Thomas Erker, Markus Müller. Synthesis and in vivo evaluation of the putative breast cancer resistance protein inhibitor [¹¹C]methyl 4-((4-(2-(6,7-dimethoxy-1,2,3,4-tetrahydroisoquinolin-2-yl)ethyl)phenyl)amino-carbonyl)-2-(quinoline-2-carboxylamino)benzoate. *Nucl Med Biol* 37 (5):637-644 (2010)
22. Martin Bauer, Rudolf Karch, Friederike Neumann, Claudia C Wagner, Kurt Kletter, Markus Müller, Wolfgang Löscher, Markus Zeitlinger, Oliver Langer*. Assessment of regional differences in tariquidar-induced P-glycoprotein modulation at the human blood-brain barrier. *J Cereb Blood Flow Metab* 30(3):510-515 (2010)
 23. Claudia Kuntner, Jens P. Bankstahl, Marion Bankstahl, Johann Stanek, Thomas Wanek, Gloria Stundner, Rudolf Karch, Rebecca Brauner, Martin Meier, Xiao-Qi Ding, Markus Müller, Wolfgang Löscher, Oliver Langer. Dose-response assessment of tariquidar and elacridar and regional quantification of P-glycoprotein inhibition at the rat blood-brain barrier using (R)-[¹¹C]verapamil PET. *Eur J Nucl Med Mol Imaging* 37(5):942-53 (2010)
 24. Claudia C Wagner, Martin Bauer, Rudolf Karch, Thomas Feurstein, Stephan Kopp, Peter Chiba, Kurt Kletter, Wolfgang Löscher, Markus Müller, Markus Zeitlinger, Oliver Langer*. A pilot study to assess the efficacy of tariquidar to inhibit P-glycoprotein at the human blood-brain barrier with (R)-¹¹C-verapamil and PET. *J Nucl Med* 50(12):1954-61 (2009)
 25. Bernd Dörner, Claudia Kuntner, Jens P. Bankstahl, Marion Bankstahl, Johann Stanek, Thomas Wanek, Gloria Stundner, Severin Mairinger, Wolfgang Löscher, Markus Müller, Oliver Langer*, Thomas Erker. Synthesis and small-animal positron emission tomography evaluation of [¹¹C]-elacridar as a radiotracer to assess the distribution of P-glycoprotein at the blood-brain barrier. *J Med Chem* 52(19):6073-82 (2009)
 26. Martin Bauer, Rudolf Karch, Friederike Neumann, Aiman Abraham, Claudia C Wagner, Kurt Kletter, Markus Müller, Markus Zeitlinger, Oliver Langer*. Age dependency of cerebral P-gp function measured with (R)-[¹¹C]verapamil and PET. *Eur J Clin Pharmacol* 65(9):941-6 (2009)
 27. Daniel Cejka, Claudia Kuntner, Matthias Preusser, Monika Fritzer-Szekeres, Barbara Fueger, Sabine Strommer, Johannes Werzowa, Thorsten Fueerer, Thomas Wanek, Maria Zsebedics, Markus Müller, Oliver Langer*, Volker Wacheck. FDG uptake is a surrogate marker for defining the optimal biological dose of the mTOR inhibitor everolimus in vivo. *Br J Cancer* 100(11):1739-45 (2009)
 28. Claudia Kuntner, Adam L. Kesner, Martin Bauer, Robert Kremslehner, Thomas Wanek, Markus Mandler, Rudolf Karch, Johann Stanek, Tanja Wolf, Markus Müller, Oliver Langer. Limitations of small-animal PET imaging with [¹⁸F]FDDNP and [¹⁸F]FDG for quantitative studies in a transgenic mouse model of Alzheimer's disease. *Mol Imaging Biol* 11(4):236-40 (2009)
 29. Jens P. Bankstahl, Claudia Kuntner, Aiman Abraham, Rudolf Karch, Johann Stanek, Thomas Wanek, Wolfgang Wadsak, Kurt Kletter, Markus Müller, Wolfgang Löscher, Oliver Langer*. Tariquidar-induced P-glycoprotein inhibition at the rat blood-brain barrier studied with (R)-[¹¹C]verapamil and PET. *J Nucl Med* 49(8):1328-35 (2008)
 30. Aiman Abraham, Gert Luurtsema, Martin Bauer, Rudolf Karch, Ekaterina Pataraiia, Christian Joukhadar, Kurt Kletter, Adriaan A. Lammertsma, Christoph Baumgartner, Markus Müller, Oliver Langer*. Peripheral metabolism of (R)-[¹¹C]verapamil in epilepsy patients. *Eur J Nucl Med Mol Imaging* 35(1):116-123 (2008)
 31. Oliver Langer*, Martin Bauer, Alexander Hammers, Rudolf Karch, Ekaterina Pataraiia, Matthias J. Koepp, Aiman Abraham, Gert Luurtsema, Martin Brunner, Raute Sunder-Plassmann, Friedrich Zimprich, Christian Joukhadar, Stephan Gentsch, Robert Dudczak, Kurt Kletter, Markus Müller, Christoph Baumgartner. Pharmacoresistance in epilepsy: a pilot PET study with the P-glycoprotein substrate R-[¹¹C]verapamil. *Epilepsia* 48(9):1774-84 (2007)
 32. Martin Bauer, Oliver Langer*, Peter Dal-Bianco, Rudolf Karch, Martin Brunner, Aiman Abraham, Rupert Lanzenberger, Andrea Hofmann, Christian Joukhadar, Paolo Carminati,

- Orlando Ghirardi, Paola Piovesan, Gianluigi Forloni, Mario E. Corrado, Nadège Lods, Robert Dudczak, Eduard Auff, Kurt Kletter, Markus Müller. A PET microdosing study with a potential anti-amyloid drug in healthy volunteers and Alzheimer's disease patients. *Clin Pharmacol Ther* 80(3): 216-227 (2006)
33. Aiman Abraham, Peter Angelberger, Kurt Kletter, Markus Müller, Christian Joukhadar, Thomas Erker, Oliver Langer*. Synthesis of fluorine-18-labelled 5- and 6-fluoro-2-pyridinamine. *J Labelled Compd Rad* 49:345-356 (2006)
 34. Oliver Langer*, Rudolf Karch, Ulrich Müller, Georg Dobrozemsky, Aiman Abraham, Markus Zeitlinger, Edith Lackner, Christian Joukhadar, Robert Dudczak, Kurt Kletter, Markus Müller, Martin Brunner. Combined PET and microdialysis for in vivo assessment of intracellular drug pharmacokinetics in humans. *J Nucl Med* 46: 1835-1841 (2005)
 35. Oliver Langer*, Andreas Krcal, Alexander Schmid, Aiman Abraham, Patrizia Minetti, Diana Celona, Dirk Roeda, Frédéric Dollé, Kurt Kletter, Markus Müller. Synthesis of 1,1-[¹¹C]-methylene-di-(2-naphthol) ([¹¹C]ST1859) for PET studies in humans. *J Labelled Compd Rad* 48:577-587 (2005)
 36. Oliver Langer*, Martin Brunner, Markus Zeitlinger, Sophie Ziegler, Ulrich Müller, Georg Dobrozemsky, Edith Lackner, Christian Joukhadar, Markus Mitterhauser, Wolfgang Wadsak, Erich Minar, Robert Dudczak, Kurt Kletter, Markus Müller. In vitro and in vivo evaluation of [¹⁸F]ciprofloxacin for the imaging of bacterial infections with PET. *Eur J Nucl Med Mol Imaging* 32(2): 143-150 (2005)
 37. Oliver Langer*, Markus Mitterhauser, Wolfgang Wadsak, Martin Brunner, Ulrich Müller, Kurt Kletter, Markus Müller. A general method for the fluorine-18 labelling of fluoroquinolone antibiotics. *J Labelled Compd Rad* 46:715-727 (2003)
 38. Oliver Langer*, Markus Mitterhauser, Martin Brunner, Markus Zeitlinger, Wolfgang Wadsak, Bernhard X. Mayer, Kurt Kletter, Markus Müller. Synthesis of fluorine-18-labeled ciprofloxacin for PET studies in humans. *Nucl Med Biol* 30: 285-291 (2003)
 39. Oliver Langer*, Tobias Frongren, Johan Sandell, Frédéric Dollé, Bengt Långström, Kjell Någren, Christer Halldin. Preparation of 4-[¹¹C]methylmetaraminol, a potential PET tracer for assessment of myocardial sympathetic innervation. *J Labelled Compd Rad* 46: 55-65 (2003)
 40. Oliver Langer, Frédéric Dollé, Christer Halldin, Françoise Vaufrey, Christine Coulon, Michele Ottaviani, Michel Bottlaender, Christian Crouzel, Kjell Någren, Bernard Mazière. Synthesis of high-specific-radioactivity 4- and 6-[¹⁸F]fluorometaraminol - PET tracers for the adrenergic nervous system of the heart. *Bioorg Med Chem* 9 (3): 677-694 (2001)
 41. Oliver Langer*, Balázs Gulyás, Johan Sandell, István Laszlovszky, Béla Kiss, György Domány, Tibor Ács, Lars Farde, Christer Halldin. Radiochemical labelling of the dopamine D3 receptor ligand RGH-1756. *J Labelled Compd Rad* 43: 1069-1074 (2000)
 42. Oliver Langer*, Christer Halldin, Yuan-Hwa Chou, Carl-Gunnar Swahn, Kjell Någren, Roberto Perrone, Francesco Berardi, Marcello Leopoldo, Lars Farde. Carbon-11 PB-12, an attempt to visualize the dopamine D4 receptor in the primate brain with positron emission tomography. *Nucl Med Biol* 27 (8): 707-714 (2000)
 43. Oliver Langer, Héric Valette, Frédéric Dollé, Christer Halldin, Christian Loc'h, Chantal Fuseau, Christine Coulon, Michele Ottaviani, Michel Bottlaender, Bernard Mazière, Christian Crouzel. High specific radioactivity (1*R*,2*S*)-4-[¹⁸F]fluorometaraminol: a PET radiotracer for mapping sympathetic nerves of the heart. *Nucl Med Biol* 27: 233-238 (2000)
 44. Johan Sandell, Oliver Langer*, Peter Larsen, Frédéric Dollé, Françoise Vaufrey, Stéphane Demphel, Christian Crouzel, Christer Halldin. Improved specific radioactivity of the PET radioligand [¹¹C]FLB 457 by use of the GE Medical Systems PETtrace MeI MicroLab. *J Labelled Compd Rad* 43: 331-338 (2000)
 45. Oliver Langer*, Kjell Någren, Frédéric Dollé, Camilla Lundkvist, Johan Sandell, Carl-Gunnar Swahn, Françoise Vaufrey, Christian Crouzel, Bernard Mazière, Christer Halldin. Precursor synthesis and radiolabelling of the dopamine D2 receptor ligand [¹¹C]raclopride from [¹¹C]methyl triflate. *J Labelled Compd Rad* 42: 1183-1193 (1999)

46. Oliver Langer, Christer Halldin, Camilla Lundkvist, Johan Sandell, Carl-Gunnar Swahn, Håkan Hall, Hans Olsson, Per Karlsson, Frédéric Dollé, Christian Loc'h, Michel Bottlaender, Bernard Bendriem, Christian Crouzel, Bernard Mazière, Lars Farde. Carbon-11 epidepride is a suitable PET radioligand for examination of extrastriatal dopamine D2 receptors. *Nucl Med Biol* 26, 509-518 (1999)
47. Oliver Langer*, Frédéric Dollé, Christian Loc'h, Christer Halldin, Françoise Vaufrey, Christine Coulon, Christian Crouzel, Kjell Någren, Bernard Mazière. Preparation of 4-and 6-[⁷⁶Br]bromometaraminol, two potential radiotracers for the study of the myocardial norepinephrine neuronal reuptake system with PET. *J Labelled Compd Rad* 39(10), 803-816 (1997)

Review articles:

48. Beatrix Wulkersdorfer, Thomas Wanek, Martin Bauer, Markus Zeitlinger, Markus Müller, Oliver Langer*. Using positron emission tomography to study transporter-mediated drug-drug interactions in tissues. *Clin Pharmacol Ther* 96(2):206-213 (2014)
49. Thomas Wanek, Severin Mairinger, Oliver Langer*. Radioligands targeting P-glycoprotein and other drug efflux proteins at the blood-brain barrier. Special issue: Carbon-11 and fluorine-18 chemistry devoted to molecular probes for imaging the brain with PET. *J Labelled Compd Rad* 56(3-4):68-77 (2013) (invited)
50. Severin Mairinger, Thomas Erker, Markus Müller, Oliver Langer*. PET and SPECT radiotracers to assess function and expression of ABC transporters in vivo. *Curr Drug Metab* 12(5):774-792 (2011) (invited)
51. Claudia C Wagner, Oliver Langer*. Approaches using molecular imaging technology - use of PET in clinical microdose studies. *Adv Drug Deliver Rev* 63:539-546 (2011) (invited)
52. Wolfgang Löscher, Oliver Langer. Imaging of P-glycoprotein function and expression to elucidate mechanisms of pharmacoresistance in epilepsy. *Curr Top Med Chem* 10(17):1785-91 (2010) (invited)
53. Martin Bauer, Claudia C Wagner, Oliver Langer*. Microdosing Studies in Humans. The Role of Positron Emission Tomography. *Drugs in R&D* 9(2):73-81 (2008) (invited)
54. Claudia C Wagner, Markus Müller, Graham Lappin, Oliver Langer*. Positron emission tomography for use in microdosing studies. *Curr Opin Drug Discov Devel* 11(1):104-10 (2008) (invited)
55. Martin Brunner, Oliver Langer. Microdialysis versus other techniques for the clinical assessment of in vivo tissue drug distribution. *AAPS J* 8(2):E263-71 (2006)
56. Oliver Langer*, Markus Müller. Methods to assess tissue-specific distribution and metabolism of drugs. *Curr Drug Metab* 5(6):463-481 (2004) (invited)
57. Oliver Langer*, Christer Halldin. PET- and SPECT tracers for mapping the cardiac nervous system. *Eur J Nucl Med Mol Imaging* 29 (3): 416-434 (2002)

Co-author:

Original research articles:

58. Kerstin Sander, Eva Galante, Thibault Gendron, Elena Yiannaki, Niral Patel, Tammy L. Kalber, Adam Badar, Matthew Robson, Sean P. Johnson, Florian Bauer, Severin Mairinger, Johann Stanek, Thomas Wanek, Claudia Kuntner, Tim Kottke, Lilia Weizel, David Dickens, Kjell Erlandsson, Brian F. Hutton, Mark F. Lythgoe, Holger Stark, Oliver Langer, Matthias Koeppe, Erik Årstad. Development of fluorine-18 labeled metabolically activated tracers for imaging of drug efflux transporters with PET. *J Med Chem* 58(15):6058-80 (2015)
59. Daniela Häusler, Claudia Kuntner, Lukas Nics, Markus Savli, Markus Zeitlinger, Thomas Wanek, Panagiotis Karagiannis, Rupert Lanzenberger, Oliver Langer, Karem Shanab, Helmut Spreitzer, Wolfgang Wadsak, Marcus Hacker, Markus Mitterhauser.

- [¹⁸F]FE@SUPPY - a suitable PET-tracer for the Adenosine A3 Receptor? An in vivo study in rodents. *Eur J Nucl Med Mol Imaging* 42: 741-749 (2015)
60. Friedrich Roehrbacher, Jens P. Bankstahl, Marion Bankstahl; Thomas Wanek, Johann Stanek, Michael Sauberer, Julia Muellauer, Thales Schroettner, Oliver Langer, Claudia Kuntner. Development and performance test of an online blood sampling system for determination of the arterial input function in rats. *EJNMMI Physics* 2015 Dec;2(1):1.
 61. Julia Müllauer, Ralf Willimayer, Andrew L. Goertzen, Thomas Wanek, Oliver Langer, Wolfgang Birkfellner, Claudia Kuntner. ¹⁸F, ¹¹C and ⁶⁸Ga in small animal PET imaging. Evaluation of partial volume correction methods. *Nuklearmedizin* 52(6):250-61 (2013)
 62. Julia Müllauer, Rudolf Karch, Jens P. Bankstahl, Marion Bankstahl, Johann Stanek, Thomas Wanek, Severin Mairinger, Markus Müller, Wolfgang Löscher, Oliver Langer, Claudia Kuntner. Assessment of cerebral P-glycoprotein expression and function with PET by combined [¹¹C]inhibitor and [¹¹C]substrate scans in rats. *Nucl Med Biol* 40(6): 755-763 (2013)
 63. Maria Feldmann, Marie-Claude Asselin, Joan Liu, Shaonan Wang, Adam McMahon, José Anton-Rodriguez, Matthew Walker, Mark Symms, Gavin Brown, Rainer Hinz, Julian Matthews, Martin Bauer, Oliver Langer, Maria Thom, Terry Jones, Christian Vollmar, John S Duncan, Sanjay M Sisodiya, Matthias J Koepp. P-glycoprotein expression and function in patients with temporal lobe epilepsy: a case-control study. *Lancet Neurol* 12(8): 777-785 (2013)
 64. Jens P. Bankstahl, Marion Bankstahl, Kerstin Römermann, Thomas Wanek, Johann Stanek, Bert Windhorst, Maren Fedrowitz, Thomas Erker, Markus Müller, Wolfgang Löscher, Oliver Langer, Claudia Kuntner. Tariquidar and elacridar are dose-dependently transported by p-glycoprotein and bcrp at the blood-brain barrier: a small-animal positron emission tomography and in vitro study. *Drug Metabol Dispos* 41(4):754-762 (2013)
 65. Martin Bauer, Markus Zeitlinger, Denis Todorut, Michaela Böhmendorfer, Markus Müller, Oliver Langer, Walter Jäger. Pharmacokinetics of single ascending doses of the P-glycoprotein inhibitor tariquidar in healthy subjects. *Pharmacology* 91(1-2):12-19 (2013)
 66. Julia Müllauer, Claudia Kuntner, Martin Bauer, Jens P. Bankstahl, Markus Müller, Rob A Voskuyl, Oliver Langer, Stina Syvänen. Pharmacokinetic-pharmacodynamic modeling of P-glycoprotein function at the rat and human blood-brain barrier studied with (*R*)-[¹¹C]verapamil positron emission tomography. *Eur J Nucl Med Mol Imaging Research* 2(1):58 (2012)
 67. Daniëlle M.E. van Assema, Mark Lubberink, Martin M. Bauer, Wiesje M. van der Flier, Robert C. Schuit, Albert D. Windhorst, Emile F.I. Comans, Nikie J. Hoetjes, Nelleke Tolboom, Oliver Langer, Markus Müller, Philip Scheltens, Adriaan A. Lammertsma, Bart N.M. van Berckel. Blood-brain barrier P-glycoprotein function in Alzheimer's disease. *Brain* 135(Pt 1):181-189 (2012)
 68. Thorsten Fuereder, Thomas Wanek, Pamina Pfliegerl, Agnes Jaeger-Lansky, Doris Hoeflmayer, Sabine Strommer, Claudia Kuntner, Markus Müller, Oliver Langer, Volker Wacheck. Gastric cancer growth control by the PI3K/mTOR inhibitor BEZ235 is tumor model dependent and correlates with [¹⁸F]FLT uptake. *Clin Cancer Res* 17(16):5322-32 (2011)
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