Publications Prof. Dr. Funke

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Peer-reviewed-articles: 39
Book chapters: 6
Reviews: 9
Patents: 8 submitted / issued

Peer-reviewed articles:

1. Malhis M, & Funke SA (2024). Mirror-image phage display for the selection of D-Amino acid peptide ligands as potential therapeutics. Current Protocols, 4, e957. doi: 10.1002/cpz1.957

2. Kenzel J, Brüggemann DA, Funke SA (2022). Selection of Listeria monocytogenes InlA-Binding Peptides Using Phage Display—Novel Compounds for Diagnostic Applications? Appl. Microbiol. 2022, 2(4), 921-933; doi.org/10.3390/applmicrobiol2040070

3. Olliges E, Stroppe S, Haile A, Reiß F, Malhis M, Funke SA, Meissner K. Open-label placebo administration decreases pain in elderly patients with symptomatic knee osteoar-thritis – a randomized controlled trial (2022)**.** Front Psychiatry, doi.org/10.3389/fpsyt.2022.853497

4. Aillaud I, Kaniyappan S, Chandupatla RR, Ramirez LM, Alkhashrom S, Eichler J, Horn AHC, Zweckstetter M, Mandelkow E, Sticht H, Funke SA (2022). A novel D-amino acid peptide with therapeutic potential, designated ISAD1, inhibits aggregation of disease relevant pro-aggregant mutant Tau and prevents Tau toxicity in vitro. Alzheimers Res Ther;14(1):15. doi: 10.1186/s13195-022-00959-z.

5. Malhis M, Kaniyappan S, Aillaud I, Chandupatla R R, Ramirez L-M, Zweckstetter M, Horn A H C, Mandelkow E, Sticht H & Funke SA (2021). Potent Tau aggregation inhibitor peptides selected against Tau-repeat 2 (PHF6*). ChemBioChem 22(21):3049-3059. doi: 10.1002/cbic.202100287

6. Dammers C, Yolcu D, Kukuk L, Willbold D, Pickhardt M, Mandelkow E, Horn AHC, Sticht H, Malhis M, Will N, Schuster J, Funke SA. Selection and Characterization of Tau binding D-enantiomeric Peptides with Potential for Therapy of Alzheimer Disease. PLoS One. 2016 Dec 22;11(12):e0167432. doi: 10.1371/journal.pone.0167432.

7. Klein, A, Ziem, T, Tusche M, Buitenhuis J, Bartnik D, Boedderich A, Wiglenda T, Wanker E, Funke SA, Brener O, Gremer L, Kutzsche J, Willbold D (2016). Optimization of the all-D peptide D3 for Aβ oligomer elimination. PLoS One. 2016 Apr 22;11(4):e0153035. doi: 10.1371/journal.pone.0153035

8. Rudolph S, Klein AN, Tusche M, Schlosser C, Elfgen A, Brener O, Teunissen C, Gremer L, Funke SA, Kutzsche J, Willbold D (2016). Competitive mirror image phage display derived peptide modulates amyloid beta aggregation and toxicity. PLoS One. 2016 Feb 3;11(2):e0147470. doi: 10.1371/journal.pone.0147470.

9. Brener O, Dunkelmann T, Gremer L, van Groen T, Mirecka E, Kadish I, Willuweit A, Kutzsche J, Jürgens D, Rudolph S, Tusche M, Bongen P, Pietruszka J, Oesterhelt F, Langen K-J, Demuth H-U, Janssen A, Hoyer W, Funke SA, Nagel-Steger L, and Willbold D (2015). QIAD assay for quantitating a compound's efficacy in elimination of toxic Aβ oligomers. Sci Rep. 2015 Sep 23;5:13222. doi: 10.1038/srep13222.

10. Pattky M, Nicolardi S, Santiago-Schübel B, Sydes D, van der Burgt YE, Klein AN, Jiang N, Mohrlüder J, Hänel K, Kutzsche J, Funke SA, Willbold D, Willbold S, Huhn C (2015). Structure characterization of unexpected covalent O-sulfonation and ion-pairing on an extremely hydrophilic peptide with CE-MS and FT-ICR-MS. Anal Bioanal Chem. 2015 Sep;407(22):6637-55.

11. Mandler M, Santic R, Gruber P, Cinar Y, Funke SA, Willbold D, Schneeberger A, Schmidt W, and Mattner F. Tailoring the antibody response to aggregated Aß using novel Alzheimer-vaccines. PLoS One. 2015 Jan 22;10(1):e0115237.

12. Widera M, Klein AN, Cinar Y, Funke SA*, Willbold D*, Schaal H* (2014). The D-amino acid peptide D3 reduces amyloid fibril boosted HIV-1 infectivity. AIDS Res Ther. 2014 Jan 14;11(1):1. doi: 10.1186/1742-6405-11-1. ***corresponding author**

13. Olubiyi OO, Frenzel D, Bartnik D, Glück JM, Brener O, Nagel-Steger L, Funke SA, Willbold D, Strodel B (2014). Amyloid Aggregation Inhibitory Mechanism of Arginine-Rich D-Peptides. Curr Med Chem. 2014;21(12):1448-57.

14. Dornieden S, Müller-Schiffmann A, Sticht H, Jiang N, Cinar Y, Wördehoff M, Korth C, Funke SA*****, Willbold D (2013). Characterization of a single-chain variable fragment recognizing a linear epitope of aβ: a biotechnical tool for studies on Alzheimer's disease? PLoS One. 2013;8(3):e59820. doi: 10.1371/journal.pone.0059820. ***corresponding author**

15. Wang-Dietrich L*, Funke SA*, Kühbach K, Wang K, Besmehn A, Willbold S, Cinar Y, Bannach O, Birkmann E, Willbold D (2013). The Amyloid-β Oligomer Count in Cerebrospinal Fluid is a Biomarker for Alzheimer's Disease. J. Alzheimers Dis. 2013, 34(4):985-94.***both authors contributed equally**

16. van Groen T, Kadish I, Funke SA, Bartnik D, Willbold D (2013). Treatment with D3 Removes Amyloid Deposits, Reduces Inflammation, and Improves Cognition in Old AβPP/PS1 Double Transgenic Mice. J. Alzheimers Dis., 34(3):609-20.

17. Sun N, Hartmann R, Lecher J, Stoldt M, Funke SA, Ludwig H-H, Demuth H-U, Kleinschmidt M, Willbold D (2012). Structural analysis of the pyroglutamate modified isoform of the Alzheimer's disease related beta-amyloid using NMR spectroscopy. J. Pept. Sci. 2012, 18(11):691-5.

18. Funke SA, Bartnik D, Glück JM, Piorkowska K, Wiesehan K, Weber U, Balazs Gulyas B, Christer Halldin C, Andrea Pfeifer A, Christian Spenger C, Andreas Muhs A, Dieter Willbold D (2012). Development of a small D-enantiomeric Alzheimer's amyloid-β binding peptide ligand for future in vivo imaging applications. Plos One, e41457.

19. Mazargui H, Leveque C, Bartnik D, Fantini J, Gouget T, Funke SA, Willbold D, Perrone L (2012). A synthetic amino acid substitution of Tyr10 in Aβ peptide sequence yields a dominant negative variant in amyloidogenesis. Aging Cell 11, 530-541.

20. Funke SA, Liu H, Sehl T, Bartnik D, Brener O, Nagel-Steger L, Wiesehan K, Willbold D (2012). Identification and characterization of an Aβ oligomer precipitating peptide that may be useful to explore gene therapeutic approaches to Alzheimer's disease. Rejuvenation Res. 15, 144-147.

21. Hübinger S, Bannach O, Funke SA, Willbold D & Birkmann E (2012). Detection of a-synuclein aggregates by fluorescence microscopy. Rejuvenation Res. 15, 213-216.

22. Müller-Schiffmann A, März-Berberich J, Andrjevna A, Rönicke R, Bartnik D, Brener O, Kutzsche J, Horn AHC, Hellmert M, Polkowska J, Gottmann K, Reymann K, Funke SA, Nagel-Steger L, Moriscot C, Schoehn G, Sticht H, Willbold D, Schrader T, Korth C (2010). Combining independent drug classes into superior, synergistically acting hybrid molecules. Angew. Chem. Int. Ed. Engl. 49, 8743-8746.

23. Funke SA, van Groen T, Kadish I, Bartnik D, Nagel-Steger L, Brener O, Sehl T, Batra-Safferling R, Moriscot C, Schoehn G, Horn AHC. Müller-Schiffmann A, Korth C, Sticht H and Willbold D (2010). Oral Treatment with the D-Enantiomeric Peptide D3 Improves Pathology and Behavior of Alzheimer's disease Transgenic Mice. ACS Chem. Neuroscience 1, 639-648.

24. Funke SA, Wang L, Birkmann E, Willbold D (2010). Single particle detection system for Aß: Adaptation of surface-FIDA to laser scanning microscopy. Rejuvenation Res. 13, 206-209.

25. Liu HM, Funke SA, Willbold D (2010). Transport of Alzheimer's disease amyloid-ß peptide binding D-amino acid peptides across an in vitro blood-brain barrier model. Rejuvenation Res. 13, 210-213.

26. Hoffmann S, Funke SA, Wiesehan K, Moedder S, Glück J, Feuerstein S, Gerdts M, Mötter J, and Willbold D (2010). Competitively selected protein ligands pay their increase in specificity by a decrease in affinity. Mol. Biosyst. 6, 126-133. **Cover article.**

27. Bartnik D*, Funke SA*, Andrei-Selmer L-C, Bacher M, Dodel R, Willbold D (2010). Differently selected D-enantiomeric peptides act on different Aß species. Rejuvenation Res. 13, 202-205.* **both authors contributed equally**

28. Schlenzig D, Manhart S, Cinar Y, Kleinschmidt M, Hause G, Willbold D, Funke SA, Schilling S, Demuth HU (2009). Pyroglutamate formation influences solubility and amyloidogenicity oof amyloid peptides. Biochemistry 48, 7072-7078.

29. Görtz P, Opatz J, Siebler M, Funke SA, Willbold D, Lange-Asschenfeldt C (2009). Transient reduction of spontaneous neuronal network activity by sublethal amyloid β (1-42) peptide concentrations. J. Neural Transm. 116, 351-355.

30. Van Groen T, Kadish I, Wiesehan K, Funke SA and Willbold D (2009). In vitro and in vivo staining characteristics of small, fluorescent, Aβ42 binding D-enantiomeric peptides in transgenic AD model mice. ChemMedChem 4, 276-282.

31. Van Groen T, Wiesehan K, Funke SA, Kadish I, Nagel-Steger L and Willbold D (2008). A novel D-enantiomeric peptide reduces Alzheimer's disease amyloid plaque load in transgenic mice. ChemMedChem 3, 1848-1852.

32. Birkmann E, Henke F, Funke SA, Bannach O, Riesner D, Willbold D (2008). A highly sensitive diagnostic assay for aggregate-related diseases e.g. prion disease and Alzheimer's disease. Rejuvenation Res. 11, 359-363.

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35. Wiesehan K, Funke SA, Fries M, Willbold D (2007). Purification of recombinantly expressed and cytotoxic human amyloid-beta peptide. J. Chrom. B 856, 229-233.

36. Birkmann E, Henke F, Weinmann N, Dumpitak C, Groshup M, Funke A, Willbold D, Riesner D (2007). Counting of single prion particles bound to a capture-antibody surface (surface-FIDA), Vet. Microbiol. 123, 294-304.

37. Funke SA, Otte N, Eggert T, Bocola M, Jaeger K-E, and Thiel W (2005). Combination of computational prescreening and experimental library construction can accelerate enzyme optimization by directed evolution. Protein. Eng. Des. Sel. 18, 509-514.

38. Eggert T, Funke SA, Rao NM, Acharya P, Krumm H, Reetz MT, and Jaeger K-E (2005). Multiplex-PCR-based recombination as a novel method for directed evolution. ChemBioChem 6, 1062-1067.

39. Funke SA, Eipper A, Reetz MT, Otte N, Thiel W, van Pouderoyen G, Dijkstra B, Jaeger K-E, and Eggert T (2003). Directed evolution of an enantioselective Bacillus subtilis lipase. Biocatal. Biotrans. 21, 67-73.

Book chapters:

1. Löffl J, Funke SA. Die Hochschule für angewandte Wissenschaften Coburg. In: Zukunftsdesign. Cuvillier Verlag Göttingen, 1. Aufl. 2017

2. S.A. Funke, E. Birkmann, D. Willbold. Detection and quantitation of Amyloid-β aggregates in body fluids may be suitable for early diagnosis of Alzheimer's disease. In: Advances in Alzheimer Research, Vol. 2, 2014, Bentham Science Ebooks.

3. van Groen T, Kadish I, Funke A, Bartnik D, Willbold D (2012). Treatment with Aβ42 Binding d-Amino Acid Peptides Reduce Amyloid Deposition and Inflammation in APP/PS1 Double Transgenic Mice. Adv. Protein Chem. Struct. Biol. 2012;88:133-52.

4. Funke SA, Willbold D (2011). Quantitation of Amyloid-β oligomers in human body fluids for Alzheimer's disease early diagnosis or therapy monitoring. Buchkapitel auf Einladung in: Alzheimer's diagnosis. Nova Publishers, ISBN: 978-1-61209-846-3. pp. 1-24.

5. van Groen T, Kadish I, Funke A and Willbold D (2011). Staining of Amyloid Beta (Abeta) Using (Immuno) Histochemical Techniques and Abeta42 Specific Peptides. In: Neuroimaging for Clinicians - Combining Research and Practice. Edited by: Julio F. P. Peres. ISBN 978-953-307-450-4. Publisher: InTech

6. Eggert T, Funke SA, Andexer JN, Reetz MT, and Jaeger K-E, Evolution of enantioselective Bacillus subtilis lipase. Invited book chapter in: Protein Engineering Handbook, 1. Auflage 2008, Wiley VCH, Weinheim, ISBN-10: 3-527-31850-X

Reviews:

1. Aillaud I, Funke SA. Tau aggregation inhibiting peptides as potential therapeutics for Alzheimer's disease.Cell Mol Biol 2022, doi 10.1007/s10571-022-01230-7

2. Kenzel J, Schlegelmilch L, Funke SA (2017). Phage Display Selection of Specific Ligands for Listeria monocytogenes: Novel Tools for Diagnostic or Therapeutic Purposes. J Microbiol Biotechnol 6, 1-8

3. Schuster J, Funke SA (2016). Methods for the specific detection and quantitation of Amyloid-? oligomers in cerebrospinal fluid. J Alzheimers Dis. 2016 May 7;53(1):53-67. doi: 10.3233/JAD-151029.

4. Sun N, Funke SA, Willbold D (2012). Mirror image phage display--generating stable therapeutically and diagnostically active peptides with biotechnological means. J Biotechnol. 2012 Oct 15;161(2):121-5.

5. Funke SA, Willbold D (2012). Peptides for diagnoses and therapy of Alzheimer's disease. Invited review, Current Pharmaceutical Design Journal, special issue "Peptides in Diagnosis and Therapy". Curr. Pharm. Design 18, 755-767. Invited.

6. Sun N, Funke SA, Willbold D (2012). A survey of peptides with effective therapeutic potential in Alzheimer's disease rodent models or in human clinical studies. Mini Rev. Med. Chem. 12, 388-398. Invited.

7. Funke, SA (2011). Detection of Soluble Amyloid-β Oligomers and Insoluble High-Molecular-Weight Particles in CSF: Development of Methods with Potential for Diagnosis and Therapy Monitoring of Alzheimer's Disease. Int. J. Alzheimers Dis. 2011;2011:151645.

8. Funke SA, Birkmann E, Willbold D (2009). Detection of Amyloid-β aggregates in body fluids: A suitable method for early diagnosis of Alzheimer's disease? Curr. Alz. Res. 6(3), 285-289. Invited.

9. Funke SA, Willbold D (2009). Mirror image phage display - a method to generate D-peptide ligands for use in diagnostic or therapeutical applications. Molecular BioSystems 5, 783-786. Cover article.