

LIST OF PUBLICATIONS

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34 publications listed in Web of Science, 1111 citations, h-index: 17 (June 2019)

PEER-REVIEWED ARTICLES

1. T. Schackel, M. Günther, S. Liu, M. Brunner, B. Sandner, R. Puttagunta, R. Müller, N. Weidner, A. Blesch. Peptides and astroglia improve the regenerative capacity of alginate gels in the injured spinal cord, *Tissue Engineering A*, **2019**, 25, 522-537.
2. S. Stähle, A. Schneider, D.B. Nebe, R. Müller. Response of osteoblast-like cells to polyamidoamine dendrimer-based surface coatings exhibiting different terminal functional groups, *Materials Science & Engineering C*, **2019**, 101, 190-203.
3. S. Liu, B. Sandner, L.S. Nicholson, T. Schackel, L. Tenenbaum, R. Puttagunta, R. Müller, N. Weidner, A. Blesch. Regulated viral brain-derived neurotrophic factor delivery in combination with Schwann cells promotes axonal regeneration through alginate capillary hydrogels after spinal cord injury, *Acta Biomaterialia*, **2017**, 60, 167-180.
4. T. Duchardt, G. Andersohn, M. Oechsner, R. Müller. Anforderungen an Kühlmittel auf Basis alternative Gefrierpunktsenkungsmittel. *Motortechnische Zeitschrift* **2016**, 77, 82-87.
5. S. Mohammad, G. Grundl, R. Müller, W. Kunz, G. Sadowski, C. Held. Influence of electrolytes on liquid-liquid equilibria of water/1-butanol and on the partitioning of 5-hydroxymethylfurfural in water/1-butanol. *Fluid Phase Equilibria* **2016**, 428, 102-111.
6. M. I. Günther, N. Weidner, R. Müller, A. Blesch. Cell-seeded alginate hydrogel scaffolds promote directed linear axonal regeneration in the injured rat spinal cord. *Acta Biomaterialia* **2015**, 27, 140-150.
7. K. Pawar, P. Prang, R. Müller, M. Caioni, U. Bogdahn, W. Kunz, N. Weidner. Intrinsic and extrinsic determinants of central nervous system axon outgrowth into alginate-based anisotropic hydrogels. *Acta Biomaterialia* **2015**, 27, 131-139.
8. D. Posavec, R. Müller, U. Bogner, G. Bernhardt, G. Knör. Polyvinyl butyral DMN-conjugates for the controlled release of singlet oxygen in medical and antimicrobial applications. *Biomaterials and Biomedical Engineering* **2014**, 1, 63-69.
9. Q.M. Kainz, S. Fernandes, C.M. Eichenseer, F. Besostri, H. Körner, R. Müller, O. Reiser. Synthesis of functionalized, dispersible carbon-coated cobalt nanoparticles for potential biomedical applications. *Faraday Discussions* **2014**, 175, 27-40.
10. E.N. Tsurko, R. Neueder, R. Müller, W. Kunz. Osmotic coefficients and activity coefficients in aqueous aminoethanoic acid-NaCl mixtures at 298.15 K. *Journal of Chemical & Engineering Data* **2014**, 59, 2741-2749.
11. D. Marovic, Z. Tarle, K.-A. Hiller, R. Müller, M. Ristic, M. Rosentritt, D. Skrtic, G. Schmalz. Reinforcement of experimental composite materials based on amorphous calcium phosphate with inert fillers. *Dental Materials* **2014**, 30, 1052-1060.
12. D. Marovic, Z. Tarle, K.-A. Hiller, R. Müller, M. Ristic, S. Music, D. Skrtic, G. Schmalz. Effect of silanized nanosilica addition on remineralizing and mechanical properties of experimental composite materials with amorphous calcium phosphate. *Clinical Oral Investigations* **2014**, 18, 783-792.

13. C. Held, T. Reschke, R. Müller, W. Kunz, G. Sadowski. Measuring and modeling aqueous electrolyte/amino acid solutions with ePC-SAFT. *Journal of Chemical Thermodynamics* **2014**, 68, 1-12.
14. H. Schweikl, K.-A. Hiller, U. Carl, R. Schweiger, A. Eidt, S. Ruhl, R. Müller, G. Schmalz. Salivary protein adsorption and *Streptococcus gordonii* adhesion to dental material surfaces. *Dental Materials* **2013**, 29, 1080-1089.
15. V. Katur, M. Eichler, E. Deigle, C. Stage, P. Karagerogiev, J. Geis-Gerstorfer, G. Schmalz, S. Ruhl, F. Rupp, R. Müller. Surface-immobilized PAMAM-dendrimers modified with cationic or anionic terminal functions: physicochemical surface properties and conformational changes after application of liquid interface stress. *Journal of Colloid and Interface Science* **2012**, 366, 179-190.
16. M. Eichler, V. Katur, L. Scheideler, M. Haupt, J. Geis-Gerstorfer, G. Schmalz, S. Ruhl, R. Müller, F. Rupp. The impact of dendrimer-grafted modifications to model silicon surfaces on protein adsorption and bacterial adhesion. *Biomaterials* **2011**, 32, 9168-9179.
17. K. Pawar, R. Müller, M. Caioni, U. Bogdahn, W. Kunz, N. Weidner. Influence of capillary diameter in alginate-based anisotropic capillary hydrogels on oriented axon regeneration. *Acta Biomaterialia* **2011**, 7, 2826-2834.
18. S.M. Sayed, R. Müller, H. Mader, A. Duerkop, O.S. Wolfbeis. Novel multicolor fluorescently labeled silica nanoparticles for interface fluorescence resonance energy transfer to and from labeled avidin. *Analytical and Bioanalytical Chemistry* **2010**, 398, 1615-1623.
19. R. Bürgers, T. Cariaga, R. Müller, M. Rosentritt, U. Reischl, G. Handel, S. Hahnel. Effects of aging on surface properties and adhesion of *Streptococcus mutans* on various fissure sealants. *Clinical Oral Investigations* **2009**, 13, 419-426.
20. P. Angele, R. Müller, D. Schumann, C. Englert, J. Zellner, B. Johnstone, J.U. Yoo, M. Nerlich, R. Kujat. Characterization of esterified hyaluronan-gelatin polymer composites suitable for chondrogenic differentiation of mesenchymal stem cells. *Journal of Biomedical Materials Research A* **2009**, 91, 416-427.
21. R. Müller, A. Eidt, K.-A. Hiller, V. Katur, S. Imazato, S. Ruhl, H. Schweikl, G. Schmalz. Influences of protein films on antimicrobial or bacteria-repellent surface coatings in a model system, using silicon wafers, *Biomaterials* **2009**, 30, 4921-4929.
22. R. Bürgers, S. Hahnel, U. Reischl, R. Müller, M. Rosentritt, G. Handel, M. Behr. Streptococcal adhesion to various luting systems and the role of mixing errors. *Acta Odontologica Scandinavica* **2009**, 67, 139-145.
23. R. Müller, S. Ruhl, K.A. Hiller, G. Schmalz, H. Schweikl. Adhesion of eukaryotic cells and *Staphylococcus aureus* to silicon model surfaces. *Journal of Biomedical Materials Research A* **2008**, 84, 817-827.
24. H. Schweikl, R. Müller, C. Englert, R. Kujat, M. Nerlich, K.A. Hiller, G. Schmalz. Proliferation of osteoblasts and fibroblasts on model surfaces of varying roughness and surface chemistry. *Journal of Material Science Materials in Medicine* **2007**, 18, 1895-1905.
25. C. Englert, T. Blunk, R. Müller, S. Schulze von Glasser, J. Baumer, J. Fierlbeck, I. Heid, M. Nerlich, J. Hammer. Bonding of articular cartilage utilizing a combination of biochemical degradation and surface cross-linking. *Arthritis Research & Therapy* **2007**, 9, R47.
26. C. Englert, P. Angele, J. Fierlbeck, S. Dendorfer, T. Schubert, R. Müller, S. Lienhard, J. Zeller, M. Nerlich, C. Neumann. Konduktives Knochenersatzmaterial mit variabler Antibiotikaversetzung. *Der Unfallchirurg* **2007**, 110, 408-413.

27. R. Müller, G. Gröger, K-A. Hiller, G. Schmalz, S. Ruhl. Fluorescence-based bacterial overlay method for simultaneous in situ quantification of attached bacteria. *Applied Environmental Microbiology* **2007**, 73, 2653-2660.
28. R. Müller, J. Abke, P. Angele, R. Kujat. Improving cell adhesion on titanium by covalent immobilization of collagen. *BIOMaterialien* **2007**, 8, 40-45.
29. A.A. Eljaouhari, R. Müller, M. Kellermeier, K. Heckmann, W. Kunz. New anisotropic ceramic membranes from chemically fixed dissipative structures. *Langmuir* **2006**, 22, 11353-11359.
30. R. Müller, K.A. Hiller, G. Schmalz, S. Ruhl. Chemiluminescence-based detection and comparison of protein amounts adsorbed on differently modified silica surfaces. *Analytical Biochemistry* **2006**, 359, 194-202.
31. R. Müller, J. Abke, E. Schnell, D. Scharnweber, R. Kujat, C. Englert, D. Taheri, M. Nerlich, P. Angele. Influence of surface pretreatment of titanium- and cobalt-based biomaterials on covalent immobilization of fibrillar collagen. *Biomaterials* **2006**, 27, 4059-4068.
32. P. Prang, R. Müller, A.A. Eljaouhari, K. Heckmann, W. Kunz, T. Weber, C. Faber, M. Vroemen, U. Bogdahn, N. Weidner. The promotion of oriented axonal regrowth in the injured spinal cord by alginate-based anisotropic capillary hydrogels. *Biomaterials* **2006**, 27, 3560-3569.
33. G. Boden, R. Holke, R. Müller. Wasserverarbeitung von nichtoxidischen Pulvern (Aqueous processing of non-oxidic powders). *Keramische Zeitschrift* **2005**, 57(4), 220-223 (Teil 1, Part 1); *Keramische Zeitschrift* **2005**, 57(5), 304-307 (Teil 2, Part 2).
34. R. Müller, J. Abke, F. Macionczyk, U. Gbureck, Z. Ruszczak, R. Mehrl, R. Kujat, C. Englert, M. Nerlich, P. Angele. Surface engineering of stainless steel materials by covalent collagen immobilization to improve implant biocompatibility. *Biomaterials* **2005**, 26, 6962-6972.
35. R. Müller, M. Knapp, K. Heckmann, M. von Ruthendorf, G. Boden. Protecting nanoscaled non-oxidic particles from oxygen uptake by coating with nitrogen containing surfactants. *Langmuir* **2004**, 20, 2598-2606.
36. P. Angele, J. Abke, R. Kujat, H. Faltermeier, D. Schumann, M. Nerlich, B. Kinner, C. Englert, Z. Ruszczak, R. Mehrl, R. Müller. Influence of different collagen species on physico-chemical properties of crosslinked collagen matrices. *Biomaterials* **2004**, 25, 2831-2841.
37. P. Angele, R. Kujat, H. Faltermeier, D. Schumann, R. Müller, M. Nerlich. Biodegradable Hyaluronsäureester/Gelatine Kompositmatrix. *BIOMaterialien* **2003**, 4, 11-18.
38. R. Müller, K. Heckmann, M. Habermann, T. Paul, M. Stratmann. New adhesion promoters for copper leadframes and epoxy resin. *Journal of Adhesion* **2000**, 72, 65-83.

BOOK CHAPTERS

1. R. Müller, I. Ferreira, K. Pawar, N. Weidner. Application of hydrogels to rewire the injured spinal cord. In: D.B. Stein, editor. *Handbook of hydrogels: Properties, preparation and applications*. Nova Science Publishers, Hauppauge, NY, p. 397-426, **2009**.
2. R. Müller, K. Heckmann, P. Angele, R. Kujat, M. Nerlich. Improving the biocompatibility of titanium- and cobalt-based biomaterials by covalent immobilization of crosslinked collagen. In: J. Breme, R. Thull, C. J. Kirkpatrick, editors. *Metallic biomaterial interfaces*. Wiley-VCH, Weinheim, p. 88-92, **2008**.
3. R. Müller, K. Heckmann, G. Boden, R. Holke, M. von Ruthendorf. In situ conditioning of nanoscaled non-oxidic particles with nitrogen containing surfactants to suppress oxygen uptake. In: E. Müller, C. Oestreich, editors. *Handling of highly dispersed powders*. Berichte aus der Verfahrenstechnik, Shaker, Aachen, p. 87-94, **2004**.

PATENTS AND PATENT APPLICATIONS

1. K. Heckmann, W. Kunz, R. Müller, P. Prang, N. Weidner, A.A. Eljaouhari. Leitschiene für die Regeneration von degeneriertem neuronalen Gewebe. DE 10 2005 040 816 A1, 29. August 2005.
EP 1782847 A2, 21. Juni 2007.
2. G. Boden, M. von Ruthendorf, K. Heckmann, R. Müller, M. Knapp. Verfahren zur Konditionierung nichtoxidischer Feinstpulver. DE 10130161 A1, Deutsche Offenlegungsschrift, 1. Februar 2003.
3. A. Atzesdorfer, R. Müller, K. Heckmann, F. Bauer. Metal Surface Coating, Especially for Microelectronics. WO 9932688 A1, 22. Dezember 2000.

SELECTED ABSTRACTS AND TALKS

1. R. Müller, M. Nützl, M. Brunner, A. Blesch, T. Schackel, R. Puttagunta, N. Weidner. Alginate-based anisotropic capillary hydrogels as biomaterial scaffolds for oriented axon regeneration. 6th International Symposium Interface Biology of Implants, Warnemünde, 8.-10. Mai 2019.
2. J. Lehnfeld, S. Stähle, J.B. Nebe, R. Müller. Strategies for novel cell-adhesive and protein-repellent surface functionalizations. 29th European Conference on Biomaterials, Maastricht, NL, 9.-13. September 2018.
3. J. Lehnfeld, V. Huber, R. Müller. Influence of buffer pH and composition on wettability of modified surfaces. The 14th Zsigmondy-Colloquium, Mainz 9.-11. April 2018.
4. J. Lehnfeld, T. Blahník, R. Müller. Development of Protein-Resistant Surface Functionalizations for Biomaterials. Jahrestagung der Deutschen Gesellschaft für Biomaterialien, Würzburg, 9.-11. November 2017.
5. R. Müller. Thin organic coatings determining the physicochemical surface properties of biomaterials. Abschluss-symposium DFG-Graduiertenkolleg Welisa, Warnemünde, 2.-4. Juli 2017.
6. J. Lehnfeld, R. Müller. Development of Protein-Resistant Surface Functionalizations for Biomaterials. The 13th Zsigmondy-Colloquium, Saarbrücken 5.-7. April 2017.
7. T. Schackel, M. Günther, S. Liu, B. Sandner, M. Motsch, R. Müller, R. Puttagunta, N. Weidner, A. Blesch. Surface modification and cell seeding into capillary alginate hydrogels promote axonal regrowth in the acutely injured spinal cord. Neuroscience 2016, San Diego, CA, USA, 12.-16. November 2016.
8. R. Müller, M. Brunner, G. Lüdike, A. Blesch, M. Günther, T. Schackel, N. Weidner. Alginate-based anisotropic capillary hydrogels as biomaterial scaffolds for oriented axon regeneration. "Dreiländertagung" Swiss, Austrian and German Societies of Biomedical Engineering, Basel, CH, 4.-6 Oktober 2016.
9. M. Schrottenbaum, B. Schmid, R. Müller. Mechanical properties and chemical stability of anisotropic alginate-based capillary hydrogels. Jahrestagung der Deutschen Gesellschaft für Biomaterialien, Aachen, 28.-30. September 2016.
10. S. Mohammad, G. Grundl, R. Müller, W. Kunz, G. Sadowski, C. Held. Salt influence on the 1 butanol/water liquid-liquid equilibrium and on the extraction behavior of 5-hydroxymethylfurfural. The 12th Zsigmondy-Colloquium, Regensburg 6.-8. April 2016.
11. A. Schneider, S. Stähle, R. Müller, J.B. Nebe. Analysis of osteoblasts characteristics in dependence of chemical dendrimer-modified surfaces. 5th International Symposium Interface Biology of Implants, Warnemünde, 6.-8. Mai 2015.

12. S. Wu, G.D. White, R. Müller, S. Ruhl. Chemical surface modifications influence salivary protein adsorption to biomaterials. 93rd General Session & Exhibition of the International Association of Dental Research, Boston, Mass., USA, 11.-14. März 2015.
13. M. Günther, M. Motsch, N. Weidner, R. Müller, A. Blesch, Anisotropic capillary hydrogels with cellular growth factor delivery promote linear axonal growth in the injured spinal cord, Congress of the Society for Neuroscience, Washington D.C., USA, 15.-19. November 2014.
14. S. Stähle, A. Schneider, R. Müller, JB. Nebe. The influence of dendrimer-modified surfaces on osteoblast architecture. Jahrestagung der Deutschen Gesellschaft für Biomaterialien, Dresden, 06.-08. November 2014.
15. G. Grundl, T. Leibße, R. Müller. Protein immobilization in alginate-based anisotropic capillary hydrogels. Jahrestagung der Deutschen Gesellschaft für Biomaterialien, Dresden, 06.-08. November 2014.
16. K. Schall, E. Deigle, G.D. White, S. Ruhl, R. Müller. Proteinadsorption auf Modelloberflächen beschichtet mit Dendrimeren unterschiedlicher Generation und Ladung. Jahrestagung der Deutschen Gesellschaft für Biomaterialien, Erlangen, 26.-28. September 2013.
17. R. Müller, V. Katur, M. Eichler, H. Schweikl, K.-A. Hiller, G. Schmalz, S. Ruhl, L. Scheideler, J. Geis-Gerstorfer, F. Rupp. Eignen sich geladene Dendrimere als antiadhäsive und/oder antimikrobielle Beschichtung von Biomaterialoberflächen? Jahrestagung der Deutschen Gesellschaft für Biomaterialien, Gießen, 10.-12. November 2011.
18. C. Held, R. Müller, W. Kunz, G. Sadowski. Salzeinfluss auf biologische Systeme. Thermodynamik Kolloquium 2011, Frankfurt am Main, 4.-6. Oktober 2011.
19. G.D. White, V. Katur, M.S. Reddy, R. Müller, S. Ruhl. Human salivary protein adsorption onto chemically modified silica beads. General Session of the International Association of Dental Research, San Diego, USA, 16.-19. März 2011.
20. H. Schweikl, A. Eidt, K.-A. Hiller, G. Schmalz, V. Katur, R. Müller, M. Eichler, F. Rupp, J. Geis-Gerstorfer, S. Ruhl. Adhesion and Viability of Oral Bacteria on Charged Self-Assembled Monolayers. 23rd European Conference on Biomaterials, Tampere, Finnland, 11.-15. September 2010.
21. G. Schmalz, A. Zielinski, K.-A. Hiller, R. Müller. Glutaraldehyde binding to bovine dentin in vitro. General Session of the International Association for Dental Research, Barcelona, Spanien, 14.-17. Juli 2010.
22. R. Müller, K. Pawar, N. Weidner. Oriented axon outgrowth from dorsal root ganglia guided by anisotropic capillary hydrogels. World Conference on Regenerative Medicine, Leipzig, 29.-31. Oktober 2009.
23. R. Müller. Biomaterials with anisotropic capillary structure for tissue regeneration. Department für Biologisch Orientierte Materialien, ETH Zürich, 18. September 2009.
24. R. Müller. Biologisierung von Implantaten. 16. Sommersymposium des Mitteldeutschen Landesverbandes für Zahnärztliche Implantologie, Dessau, 4. September 2009.
25. V. Katur, A. Eidt, M. Eichler, KA. Hiller, F. Rupp, G. Schmalz, S. Ruhl, R. Müller. Adhesion of *Streptococcus gordonii* to positively and negatively charged self-assembled monolayers. 3rd Symposium of Interface Biology of Implants, Warnemünde, 13.-15. Mai 2009.
26. R. Müller. Bioaktivierung von metallischen Implantatoberflächen. Cluster Chemie Workshop „Innovative funktionale Oberflächen: Neue Möglichkeiten für etablierte Märkte“, Augsburg, 9. Dezember 2008.