

## Peer Reviewed Articles

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Simona B.R., Hirt L., Demkó L., Zambelli T., Vörös J., **Ehrbar M.**, and Milleret V., Density gradients at hydrogel interfaces for enhanced cell penetration. *Biomater. Sci.*, DOI: 10.1039/C4BM00416G

Kivelio A., Ochsenbein-Koelble N., Zimmermann R., **Ehrbar M.**, Engineered cell instructive matrices for fetal membrane healing. *Acta Biomat.*, doi: 10.1016/j.actbio.2014.12.011

Lienemann P.S., Devaud Y.R., Reuten R., Simona B.R., Karlsson M., Weber W., Koch M., Lutolf M.P., Milleret V., **Ehrbar M.**, Modular Poly(ethylene glycol) Matrices for the Controlled 3D-Localized Osteogenic Differentiation of Mesenchymal Stem Cells. *Integr. Biol.*, 2015, 7 (1), 101 - 111

Metzger S., Lienemann P.S., Ghayor C., Weber W., Martin I., Weber F.E., **Ehrbar M.**, Modular Poly(ethylene glycol) Matrices for the Controlled 3D-Localized Osteogenic Differentiation of Mesenchymal Stem Cells. *Adv Healthc Mater.* 2014 Oct 31. doi: 10.1002/adhm.201400547.

Sacchi V., Mittermayr R., Hartinger J., Martino M.M., Lorentz K.M., Wolbank S., Hofmann A., Largo R. A., Marschall J. S., Groppe E., Gianni-Barrera R., **Ehrbar M.**, Hubbell J. A., Redl H., Banfi A. Long-lasting fibrin matrices ensure stable and functional angiogenesis by highly tunable, sustained delivery of recombinant VEGF164. *Proceedings of the National Academy of Sciences of the United States of America.* 2014;111:6952-7.

Moriyama M., Metzger S., van der Vlies A.J., Uyama H., **Ehrbar M.**, Hasegawa U. Inhibition of Angiogenesis by Antioxidant Micelles. *Adv Healthc Mater.* 2014. doi: 10.1002/adhm.201400249

Milleret V., Ziogas A., Buzzi S., Heuberger R., Zucker A., **Ehrbar M.** Effect of oxide layer modification of CoCr stent alloys on blood activation and endothelial behavior. *Journal of biomedical materials research Part B, Applied biomaterials.* 2014.

Milleret V., Simona B.R., Lienemann P.S., Voros J., **Ehrbar M.** Electrochemical control of the enzymatic polymerization of PEG hydrogels: formation of spatially controlled biological microenvironments. *Adv Healthc Mater.* 2014;3:508-14.

Largo R.A., Ramakrishnan V.M., Marschall J.S., Ziogas A., Banfi A., Eberli D., **Ehrbar M.** Long-term Biostability and Bioactivity of Fibrin Linked VEGF121 in vitro and in vivo. *Biomater. Sci.* 2014;4:581 - 90.

Hanseler P., **Ehrbar M.**, Kruse A., Fischer E., Schibli R., Ghayor C., Weber F.E. Delivery of BMP-2 by two clinically available apatite materials: In vitro and in vivo comparison. *J Biomed Mater Res A.* 2014.

Cai W.X., Zheng L.W., Li C.L., Ma L., **Ehrbar M.**, Weber F.E., Zwalen R.A. Effect of different rhBMP-2 and TG-VEGF ratios on the formation of heterotopic bone and neovessels. *BioMed research international.* 2014;2014:571510.

Mosiewicz, K.A., Kolb, L., van der Vlies, A.J., Martino, M.M., Lienemann, P.S., Hubbell, J.A., **Ehrbar, M.** & Lutolf, M.P. In situ cell manipulation through enzymatic hydrogel photopatterning. *Nat Mater.* 12 1072-1078 (2013).

Kivelio, A., Dekoninck, P., Perrini, M., Brubaker, C.E., Messersmith, P.B., Mazza, E., Deprest, J., Zimmermann, R., **Ehrbar, M.** & Ochsenbein-Kolble, N. Mussel mimetic tissue adhesive for fetal membrane repair: initial in vivo investigation in rabbits. *European journal of obstetrics, gynecology, and reproductive biology.* 171, 240-5. (2013).

Gubeli, R.J., Schoneweis, K., Huzly, D., **Ehrbar, M.**, Charpin-El Hamri, G., El-Baba, M.D., Weber W. Pharmacologically triggered hydrogel for scheduling hepatitis B vaccine administration. *Scientific reports.* 3 2610 (2013).

Ruiz-Villalba, A., Ziogas, A., **Ehrbar, M.** & Perez-Pomares, J.M. Characterization of epicardial-derived cardiac interstitial cells: differentiation and mobilization of heart fibroblast progenitors. *PLoS One* 8, e53694 (2013).

Perrini, M., Burzle, W., Haller, C., Ochsenbein-Kolble, N., Deprest, J., Zimmermann, R., Mazza, E. & **Ehrbar, M.** Contractions, a risk for premature rupture of fetal membranes: a new protocol with cyclic biaxial tension. *Med Eng Phys* 35, 846-851 (2013).

Muller, K., Engesser, R., Metzger, S., Schulz, S., Kampf, M.M., Busacker, M., Steinberg, T., Tomakidi, P., **Ehrbar, M.**, Nagy, F., Timmer, J., Zubriggen, M.D. & Weber, W. A red/far-red light-responsive bi-stable toggle switch to control gene expression in mammalian cells. *Nucleic Acids Res* 41, e77 (2013).

Mauri, A., Perrini, M., Mateos, J.M., Maake, C., Ochsenbein-Koelble, N., Zimmermann, R., **Ehrbar, M.** & Mazza, E. Second harmonic generation microscopy of fetal membranes under deformation: Normal and altered morphology. *Placenta* (2013).

Lienemann, P.S., Karlsson, M., Sala, A., Wischhusen, H.M., Weber, F.E., Zimmermann, R., Weber, W., Lutolf, M.P. & **Ehrbar, M.** A versatile approach to engineering biomolecule-presenting cellular microenvironments. *Adv Healthc Mater* 2, 292-296 (2013).

Karlsson, M., Rebmann, B., Lienemann, P.S., Sprossmann, N., **Ehrbar, M.**, Radziwill, G. & Weber, W. Pharmacologically Controlled Protein Switch for ON-OFF Regulation of Growth Factor Activity. *Scientific reports* 3, 2716 (2013).

- Karlsson, M., Lienemann, P.S., Sprossmann, N., Heilmann, K., Brummer, T., Lutolf, M.P., **Ehrbar, M.** & Weber, W. A generic strategy for pharmacological caging of growth factors for tissue engineering. *Chemical communications* 49, 5927-5929 (2013).
- Hoffmann, D.C., Willenborg, S., Koch, M., Zwolanek, D., Muller, S., Becker, A.K., Metzger, S., **Ehrbar, M.**, Kurschat, P., Hellmich, M., Hubbell, J.A. & Eming, S.A. Proteolytic processing regulates placental growth factor activities. *J Biol Chem* 288, 17976-17989 (2013).
- Gubeli, R.J., Laird, D., **Ehrbar, M.**, Ritter, B.S., Steinberg, T., Tomakidi, P. & Weber, W. Pharmacologically tunable polyethylene-glycol-based cell growth substrate. *Acta Biomater* 9, 8272-8278 (2013).
- Cai, W.X., Zheng, L.W., Weber, F.E., Li, C.L., Ma, L., Ehrbar, M. & Zwahlen, R.A. Heterotopic bone formation around vessels: pilot study of a new animal model. *BioResearch open access* 2, 266-272 (2013).
- Buerzle, W., Haller, C.M., Jabareen, M., Egger, J., Mallik, A.S., Ochsenbein-Koelble, N., **Ehrbar, M.** & Mazza, E. Multiaxial mechanical behavior of human fetal membranes and its relationship to microstructure. *Biomech Model Mechanobiol* 12, 747-762 (2013).
- Studer, D., Lischer, S., Jochum, W., **Ehrbar, M.**, Zenobi-Wong, M. & Maniura-Weber, K. Ribosomal protein L13a as a reference gene for human bone marrow-derived mesenchymal stromal cells during expansion, adipogenic, chondrogenic, and osteogenesis. *Tissue Eng Part C Methods* 18, 761-771 (2012).
- Lienemann, P.S., Lutolf, M.P. & **Ehrbar, M.** Biomimetic hydrogels for controlled biomolecule delivery to augment bone regeneration. *Adv Drug Deliv Rev* 64, 1078-1089 (2012).
- Haller, C.M., Buerzle, W., Kivelio, A., Perrini, M., Brubaker, C.E., Gubeli, R.J., Mallik, A.S., Weber, W., Messersmith, P.B., Mazza, E., Ochsenbein-Koelble, N., Zimmermann, R. & **Ehrbar, M.** Mussel-mimetic tissue adhesive for fetal membrane repair: an ex vivo evaluation. *Acta Biomater* 8, 4365-4370 (2012).
- Gubeli, R.J., **Ehrbar, M.**, Fussenegger, M., Friedrich, C. & Weber, W. Synthesis and characterization of PEG-based drug-responsive biohybrid hydrogels. *Macromol Rapid Commun* 33, 1280-1285 (2012).
- Zeisberger, S.M., Schulz, J.C., Mairhofer, M., Ponsaerts, P., Wouters, G., Doerr, D., Katsen-Globa, A., **Ehrbar, M.**, Hescheler, J., Hoerstrup, S.P., Zisch, A.H., Kolbus, A. & Zimmermann, H. Biological and physicochemical characterization of a serum- and xeno-free chemically defined cryopreservation procedure for adult human progenitor cells. *Cell Transplant* 20, 1241-1257 (2011).
- Sala, A., Hanseler, P., Ranga, A., Lutolf, M.P., Voros, J., **Ehrbar, M.** & Weber, F.E. Engineering 3D cell instructive microenvironments by rational assembly of artificial extracellular matrices and cell patterning. *Integr Biol (Camb)* 3, 1102-1111 (2011).
- Ehrbar, M.**, Hlushchuk, R., Reichmuth, P., Heinemann, N., Styp-Rekowska, B., Escher, R., Baum, O., Lienemann, P., Makanya, A., Keshet, E. & Djonov, V. Decrease in VEGF expression induces intussusceptive vascular pruning. *Arterioscler Thromb Vasc Biol* 31, 654-660 (2011).
- Guillaume-Gentil, O., Semenov, O.V., Zisch, A.H., Zimmermann, R., Voros, J. & **Ehrbar, M.** pH-controlled recovery of placenta-derived mesenchymal stem cell sheets. *Biomaterials* 32, 4376-4384 (2011).
- Ehrbar, M.**, Sala, A., Lienemann, P., Ranga, A., Mosiewicz, K., Bittermann, A., Rizzi, S.C., Weber, F.E. & Lutolf, M.P. Elucidating the role of matrix stiffness in 3D cell migration and remodeling. *Biophys J* 100, 284-293 (2011).
- Zeisberger, S.M., Schulz, J.C., Mairhofer, M., Ponsaerts, P., Wouters, G., Doerr, D., Katsen-Globa, A., **Ehrbar, M.**, Hescheler, J., Hoerstrup, S.P., Zisch, A.H., Kolbus, A. & Zimmermann, H. Biological and physicochemical characterization of a serum- and xeno-free chemically defined cryopreservation procedure for adult human progenitor cells. *Cell Transplant* 20, 1241-1257 (2010).
- Webster, D., Wasserman, E., **Ehrbar, M.**, Weber, F., Bab, I. & Muller, R. Mechanical loading of mouse caudal vertebrae increases trabecular and cortical bone mass-dependence on dose and genotype. *Biomech Model Mechanobiol* 9, 1023-1033 (2010).
- San Miguel, B., Kriauciunas, R., Tosatti, S., **Ehrbar, M.**, Ghayor, C., Textor, M. & Weber, F.E. Enhanced osteoblastic activity and bone regeneration using surface-modified porous bioactive glass scaffolds. *J Biomed Mater Res A* 94, 1023-1033 (2010).
- Sala, A., **Ehrbar, M.**, Trentin, D., Schoenmakers, R.G., Voros, J. & Weber, F.E. Enzyme mediated site-specific surface modification. *Langmuir* 26, 11127-11134 (2010).
- Krahenbuehl, T.P., Stauber, M., **Ehrbar, M.**, Weber, F., Hall, H. & Muller, R. Effects of muCT radiation on tissue engineered bone-like constructs. *Biomed Tech (Berl)* 55, 245-250 (2010).
- Kampf, M.M., Christen, E.H., **Ehrbar, M.**, Daoud-El Baba, M., Charpin-El Hamri, G., Fussenegger, M. & Weber, W. A Gene Therapy Technology-Based Biomaterial for the Trigger-Inducible Release of Biopharmaceuticals in Mice. *Adv Funct Mater* 20, 2534-2538 (2010).
- Jo, Y.S., Rizzi, S.C., **Ehrbar, M.**, Weber, F.E., Hubbell, J.A. & Lutolf, M.P. Biomimetic PEG hydrogels crosslinked with minimal plasmin-sensitive tri-amino acid peptides. *J Biomed Mater Res A* 93, 870-877 (2010).

Bott, K., Upton, Z., Schrobback, K., **Ehrbar, M.**, Hubbell, J.A., Lutolf, M.P. & Rizzi, S.C. The effect of matrix characteristics on fibroblast proliferation in 3D gels. *Biomaterials* 31, 8454-8464 (2010).

## Book Contributions

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Kivelio A. and **Ehrbar M.** Recent advances in 3D tissue models, In: Matsusaki M, Akagi T, Akashi M (eds) Engineered Cell Manipulation for Biomedical Applications, Springer, Japan (Springer 2014).

Zisch, A.H. & **Ehrbar, M.** (eds.). Cell-Demanded Release of Growth Factors., 463-473 (Elsevier, 2011).

Largo R, Ramakrishnan V, **Ehrbar M**, Plock J, Sulser T, Eberli D. Angiogenesis and Vascularity for Tissue Engineering. Regenerative Medicine and Tissue Engineering: InTec; 2011. p. 588.