

REFERENCES

- [1] S.P.N. Ami R. Amini^{1,2}, Cato T. Laurencin^{1,2,3,5}, "Bone Tissue Engineering: Recent Advances and Challenges Ami," *Crit. Rev. Biomed. Eng.* 40 (2013) 363–408.
- [2] Hyun-Shin Park, Fibrin Contained Semi - Solid Osteoblast Composition for Curing Bone Fracture and Method for Producing the Same, US 20080213229, 2016.
- [3] C.-H. Chang, Osteoblast composition of semi - solidified mixed fibrin for bone fracture agglutination and its manufacturing method, 2006135126, 2016.
- [4] G.S. Offeddu, J.C. Ashworth, R.E. Cameron, M.L. Oyen, "Multi-scale mechanical response of freeze-dried collagen scaffolds for tissue engineering applications," *J. Mech. Behav. Biomed. Mater.* 42 (2015) 19–25.
- [5] J.T.B. Ratnayake, M. Mucalo, G.J. Dias, "Substituted hydroxyapatites for bone regeneration: A review of current trends," *J. Biomed. Mater. Res. - Part B Appl. Biomater.* 105 (2017) 1285–1299.
- [6] Z. Chen, Y. Song, J. Zhang, W. Liu, J. Cui, H. Li, F. Chen, "Laminated electrospun nHA/PHB-composite scaffolds mimicking bone extracellular matrix for bone tissue engineering," *Mater. Sci. Eng. C.* 72 (2017) 341–351.
- [7] B. Noorani, F. Yazdian, A. Khoshraftar, R. Vaez Ghaemi, Z. Alihemmati, H. Rashedi, S. Shahmoradi, "Fabrication and evaluation of nanofibrous polyhydroxybutyrate valerate scaffolds containing hydroxyapatite particles for bone tissue engineering," *Int. J. Polym. Mater. Polym. Biomater.* 0 (2018) 1–9.
- [8] D. Mondal, M. Griffith, S.S. Venkatraman, "Polycaprolactone-based biomaterials for tissue engineering and drug delivery: Current scenario and challenges," *Int. J.*

- Polym. Mater. Polym. Biomater. 65 (2016) 255–265.
- [9] S. Changotade, S. Frasca, S. Ramtani, A. Consalus, C. Langueh, J. Collombet, D. Lutomski, "In vitro and in vivo proves of concept for the use of a chemically cross-linked poly (ester-urethane- urea) scaffold as an easy handling elastomeric biomaterial for bone regeneration," *Regen. Biomater.* (2019) 1–13.
- [10] N. Shadjou, M. Hasanzadeh, B. Khalilzadeh, " Graphene based scaffolds on bone tissue engineering," *Bioengineered.* 5979 (2017) 00–00.
- [11] J. Hendriks, J. Riesle, C.A. van Blitterswijk, "Co-culture in cartilage tissue engineering," *J. Tissue Eng. Regen. Med.* 4 (2010) 524–531.
- [12] V.J. R Langer, "Tissue Engineering," *Science.* 260 (1993) 920–6.
- [13] J. Mitra, G. Tripathi, A. Sharma, B. Basu, "RSC Advances Scaffolds for bone tissue engineering : role of surface patterning on osteoblast response," *RSC Adv.* 3 (2013) 11073–11094.
- [14] Katherine Gomes Truncate, *Tissue - derived tissugenic implants , and methods of fabricating and using same*, 8834928, 2016.
- [15] F. Viti, S. Scaglione, A. Orro, L. Milanese, "Guidelines for managing data and processes in bone and cartilage tissue engineering," *BMC Bioinformatics.* 15 (2014) S14.
- [16] M. Swetha, K. Sahithi, A. Moorthi, N. Srinivasan, "International Journal of Biological Macromolecules Biocomposites containing natural polymers and hydroxyapatite for bone tissue engineering," *Int. J. Biol. Macromol.* 47 (2010) 1–4.
- [17] T. De Witte, L.E. Fratila-apachitei, A.A. Zadpoor, N.A. Peppas, "Bone tissue engineering via growth factor delivery : from scaffolds to complex matrices," *Regen. Biomater.* (2018) 197–211.
- [18] P. Bhattacharjee, B. Kundu, D. Naskar, H. Kim, T.K. Maiti, D. Bhattacharya, S.C. Kundu, "Silk scaffolds in bone tissue engineering : An overview," *Acta Biomater.* 63 (2017) 1–17.
- [19] C. Li, C. Vepari, H.-J. Jin, H.J. Kim, D.L. Kaplan, " Electrospun silk-BMP-2

- scaffolds for bone tissue engineering., "Biomaterials. 27 (2006) 3115–24.
- [20] L.H. Li D, Zhang Z, Zheng C, Zhao B, Sun K, Nian Z, Zhang X, Li R, "Cytocompatibility and preparation of bone tissue engineering scaffold by combining low temperature three dimensional printing and vacuum freeze-drying techniques," Chinese J. Reparative Reconstr. Surg. 30 (2016) 292–7.
- [21] C. Gao, Y. Deng, P. Feng, Z. Mao, P. Li, B. Yang, "Current Progress in Bioactive Ceramic Scaffolds for Bone Repair and Regeneration," Int. J. Mol. Sci. 15 (2014) 4714–4732.
- [22] P. Kumar, B.S. Dehiya, A. Sindhu, "Comparative study of chitosan and chitosan – gelatin scaffold for tissue engineering," Int. Nano Lett. 7 (2017) 285–290.
- [23] J. Zhang, G. Liu, Q. Wu, J. Zuo, Y. Qin, J. Wang, "Novel Mesoporous Hydroxyapatite / Chitosan Composite for Bone Repair," J. Bionic Eng. 9 (2012) 243–251.
- [24] A. Olad, F. Farshi Azhar, "The synergetic effect of bioactive ceramic and nanoclay on the properties of chitosan–gelatin/nanohydroxyapatite–montmorillonite scaffold for bone tissue engineering," Ceram. Int. 40 (2014) 10061–10072.
- [25] J.E.R.-V. Liliana Polo-Corrales Magda Latorre-Esteves, "Scaffold Design for Bone Regeneration," J Nanosci Nanotechnol. 14 (2014) 15–56.
- [26] X. Wang, B. Ding, B. Li, "Biomimetic electrospun nanofibrous structures for tissue engineering," Mater. Today. 16 (2013) 229–241.
- [27] A.L. Boskey, "Bone composition : relationship to bone fragility and antiosteoporotic drug effects," Bonekey Rep. 2 (2013) 1–11.
- [28] K.A. Jansen, P. Atherton, C. Ballestrem, "Seminars in Cell & Developmental Biology Mechanotransduction at the cell-matrix interface," Semin. Cell Dev. Biol. 71 (2017) 75–83.
- [29] J. Jeon, M.S. Lee, H.S. Yang, "Differentiated osteoblasts derived decellularized extracellular matrix to promote osteogenic differentiation," Biomater. Res. 22 (2018) 1–9.

- [30] Hiromasa Miyaji, Yoji Yamada, Takaaki Uochi. Inducer of differentiation of stem cell into osteoblast, 2006123699, 2016.
- [31] Castaneda Juan Rafael Munoz, Improved differentiation of mesenchymal stem cells into osteoblasts, EP2899266, 2016.
- [32] R. Logithkumar, A. Keshavnarayan, S. Dhivya, A. Chawla, S. Saravanan, N. Selvamurugan, "A review of chitosan and its derivatives in bone tissue engineering," *Carbohydr. Polym.* 151 (2016) 172–188.
- [33] B. Dhandayuthapani, Y. Yoshida, T. Maekawa, D.S. Kumar, "Polymeric Scaffolds in Tissue Engineering Application : A Review," *International Journal of Polymer Science.* 2011 (2011) 1-19.
- [34] S. Samavedi, A.R. Whittington, A.S. Goldstein, "Calcium phosphate ceramics in bone tissue engineering: A review of properties and their influence on cell behavior," *Acta Biomater.* 9 (2013) 8037–8045.
- [35] T. Ghassemi, A. Shahroodi, A. Moradi, "Current Concepts in Scaffolding for Bone Tissue Engineering," *The Archives of Bone and joint Surgery.* 90 (2018) 90–99.
- [36] Š. Monika, "Substituted hydroxyapatites for biomedical applications : A review," *Ceramics International.* 41 (2015) 9203–9231.
- [37] A. Rahul, Y. Luo, M. Schumacher, B. Nies, A. Lode, M. Gelinsky, "3D plotting of growth factor loaded calcium phosphate cement scaffolds," *Acta Biomater.* 27 (2015) 264–274.
- [38] J.P. Rao, K.E. Geckeler, "Progress in Polymer Science Polymer nanoparticles : Preparation techniques and size-control parameters," *Prog. Polym. Sci.* 36 (2011) 887–913.
- [39] C. Ulbrich, M. Wehland, J. Pietsch, G. Aleshcheva, P. Wise, J. Van Loon, N. Magnusson, M. Infanger, J. Grosse, C. Eilles, A. Sundaresan, D. Grimm, "The Impact of Simulated and Real Microgravity on Bone Cells and Mesenchymal Stem Cells," *BioMed Research International.* 2014 (2014) 1-15.
- [40] X. Li, L. Jin, G. Balian, C.T. Laurencin, D.G. Anderson, "Demineralized bone

- matrix gelatin as scaffold for osteochondral tissue engineering," *Biomaterials*.27 (2006) 2426–2433.
- [41] G.O. Mari C. Echave, Laura Saenz del Burgo , Jose L. Pedraz, "Gelatin as Biomaterial for Tissue Engineering," *Curr. Pharm. Des.* 23 (2017) 3567–3584.
- [42] F. Baino, G. Novajra, C. Vitale-brovarone, Bioceramics and Scaffolds : A winning Combination for Tissue engineering,"*Frontiers in Bioengineering and Biotechnology.* 3 (2015) 1–17.
- [43] F. Zhao, W.L. Grayson, T. Ma, B. Bunnell, W.W. Lu, "Effects of hydroxyapatite in 3-D chitosan-gelatin polymer network on human mesenchymal stem cell construct development," *Biomaterials.* 27 (2006) 1859–1867.
- [44] M. Rezazadeh, S. Sudin, M. Mahdi, T. Mahtab," Effect of Post-Treatment Techniques on Corrosion and Wettability of Hydroxyapatite-Coated Co – Cr – Mo Alloy," *Arab. J. Sci. Eng.* 40 (2015) 1197–1203.
- [45] H.D. Kim, S. Amirthalingam, S.L. Kim, S.S. Lee, J. Rangasamy, N.S. Hwang, "Biomimetic Materials and Fabrication Approaches for Bone Tissue Engineering," *Adv. Healthc. Mater.* 1700612 (2017) 1–18.
- [46] M. Canillas, P. Pena, A.H. De Aza, M.A. Rodríguez," Calcium phosphates for biomedical applications, "Boletín La Soc. Española Cerámica y Vidr. 56 (2017) 91–112.
- [47] R. Ranjan, A. Mishra, "Parametric Optimization of Laser Beam Micro-Grooving of Hydroxyapatite," *Arab. J. Sci. Eng.* 41 (2016) 4607–4612. doi:10.1007/s13369-016-2225-0.
- [48] I. Denry, L.T. Kuhn, "Design and characterization of calcium phosphate ceramic scaffolds for bone tissue engineering," *Dent. Mater.* 32 (2015) 43–53.
- [49] F. Munarin, P. Petrini, R. Gentilini, R.S. Pillai, S. Dirè, M.C. Tanzi, V.M. Sglavo, "Micro- and nano-hydroxyapatite as active reinforcement for soft biocomposites," *Int. J. Biol. Macromol.* 72 (2015) 199–209.
- [50] J. Venkatesan, R. Pallela, I. Bhatnagar, S. Kim, "International Journal of Biological

- Macromolecules Chitosan – amylopectin / hydroxyapatite and chitosan – chondroitin sulphate / hydroxyapatite composite scaffolds for bone tissue engineering," *Int. J. Biol. Macromol.* 51 (2012) 1033–1042.
- [51] J. a. F. Gamelas, a. G. Martins, "Surface properties of carbonated and non-carbonated hydroxyapatites obtained after bone calcination at different temperatures," *Colloids Surfaces A Physicochem. Eng. Asp.* 478 (2015) 62–70.
- [52] D. Yang, H. Kim, J. Lee, H. Jeon, W. Ryu, "Direct modulus measurement of single composite nano fi bers of silk fi broin / hydroxyapatite nanoparticles," *Composites Science and Technology* 122 (2016) 113–121.
- [53] L. Morej, A. Delgado, A.A. Ribeiro, M.V. De Oliveira, E. Mendiz, I. Garc, "Development , Characterization and In Vitro Biological Properties of Scaffolds Fabricated From Calcium Phosphate Nanoparticles," *Int. J. Mol. Sci.* 20 (2019) 1–23.
- [54] T.J. Levingstone, E. Thompson, A. Matsiko, A. Schepens, J.P. Gleeson, F.J.O. Brien, "Multi-layered collagen-based scaffolds for osteochondral defect repair in rabbits," *Acta Biomater.* 32 (2016) 149–160.
- [55] J. Seo, S. Dae, J. Venkatesan, I. Bhatnagar, H. Kyung, H. Taek, S. Kim, "International Journal of Biological Macromolecules In vivo study of chitosan-natural nano hydroxyapatite scaffolds for bone tissue regeneration," *Int. J. Biol. Macromol.* 67 (2014) 360–366.
- [56] and D.J.N. Harry C. Blair, , Quitterie C. Larrouture, , Yanan Li, , Hang Lin, , Donna Beer-Stoltz, , Li Liu, , Rocky S. Tuan, , Lisa J. Robinson, , Paul H. Schlesinger, "Osteoblast Differentiation and Bone Matrix Formation In Vivo and In Vitro," *Tissue Eng. Part B Rev.* 23 (2017) 268–280.
- [57] S. Tee, J. Fu, C.S. Chen, P.A. Janmey," Cell Shape and Substrate Rigidity Both Regulate Cell Stiffness," *Biophysj.* 100 (2011) L25–L27.
- [58] S. V Dorozhkin, "Calcium Orthophosphate (CaPO₄) Scaffolds for Bone Tissue Engineering Applications," *J. Biotechnol. Biomed. Sci.* 1 (2018) 25–93.
- [59] F. Gattazzo, A. Urciuolo, P. Bonaldo," Extracellular matrix: A dynamic

- microenvironment for stem cell niche ☆, *Biochimica et Biophysica Acta - Gen. Subj.* 1840 (2014) 2506–2519.
- [60] J. Radhakrishnan, A. Manigandan, P. Chinnaswamy, "Biomaterials Gradient nano-engineered in situ forming composite hydrogel for osteochondral regeneration," *Biomaterials*. 162 (2018) 82–98.
- [61] W.G.C. Marc D.McKee, Chapter 2 - Bone Matrix and Mineralization, Academic Press, 2012.
- [62] J.J. J.AnS.Leeuwenburgh, J.Wolke, Mineralization processes in hard tissue: Bone, Woodhead publishing series in biomaterials, 2016.
- [63] I. Subuki, N. Adnan, R.W. Sharudin, "Biodegradable scaffold of natural polymer and hydroxyapatite for bone tissue engineering: A short review," *AIP Conf. Proc.* 2031 (2018).
- [64] P. Turon, L. del Valle, C. Alemán, J. Puiggali, "Biodegradable and Biocompatible Systems Based on Hydroxyapatite Nanoparticles," *Appl. Sci.* 7 (2017) 60.
- [65] Deborah D.L.Chung, *Polymer-Matrix Composites: Structure and Processing*, 2nd ed., Butterworth Heinemann, NewYork, Springer 2017.
- [66] W. Yue, R.J. Kane, R.K. Roeder, G.L. Converse, "Hydroxyapatite-reinforced polymer biocomposites for synthetic bone substitutes," *Jom.* 60 (2008) 38–45.
- [67] Yanovska, V. Kuznetsov, A. Stanislavov, Husak, Pogorielov, V. Starikov, S. Bolshanina, S. Danilchenko, "Synthesis and characterization of hydroxyapatite-gelatine composite materials for orthopaedic application," *Mater. Chem. Phys.* 183 (2016) 93–100.
- [68] K. Maji, S. Dasgupta, B. Kundu, A. Bissoyi, "Development of gelatin-chitosan-hydroxyapatite based bioactive bone scaffold with controlled pore size and mechanical strength," *J. Biomater. Sci. Polym. Ed.* 26 (2015) 1190–1209..
- [69] S. Stratton, N.B. Shelke, K. Hoshino, S. Rudraiah, S.G. Kumbar, "Bioactive Materials Bioactive polymeric scaffolds for tissue engineering," *Bioact. Mater.* 1 (2016) 93–108.

- [70] C. Shuai, Y. Zhou, Y. Yang, P. Feng, L. Liu, C. He, M. Zhao, S. Yang, C. Gao, P. Wu, "Biodegradation resistance and bioactivity of hydroxyapatite enhanced Mg-Zn composites via selective laser melting", *Materials (Basel)*. 10 (2017).
- [71] S. Dasgupta, K. Maji, "Comparative study on Mechanical Strength of Macroporous Hydroxyapatite-Biopolymer Based Composite Scaffold," *Int. Conf. Adv. Eng. Technol.* (2014) 474–480.
- [72] S. Behera, D. Naskar, S. Sapru, P. Bhattacharjee, "Hydroxyapatite reinforced inherent RGD containing silk fibroin composite scaffolds : Promising platform for bone tissue engineering, *Nanomedicine Nanotechnology*," *Biol. Med.* 13 (2017) 1745–1759.
- [73] M. Persson, P.P. Lehenkari, L. Berglin, S. Turunen, M.A.J. Finnilä, J. Risteli, M. Skrifvars, J. Tuukkanen, "Osteogenic Differentiation of Human Mesenchymal Stem cells in a 3D Woven Scaffold," *Sci. Rep.* 8 (2018) 1–12.
- [74] C. Gao, S. Peng, P. Feng, C. Shuai, "Bone biomaterials and interactions with stem cells," *Bone Res.* 5 (2017) 1–33.
- [75] L. Chen, J. Hu, J. Ran, X. Shen, H. Tong, "Synthesis and Cytocompatibility of Collagen / Hydroxyapatite Nanocomposite Scaffold for Bone Tissue Engineering, *Polymer Composites*"(2016)1-10.
- [76] Z.A. Uwais, M.A. Hussein, M.A.S.N. Al-aqeeli, "Surface Modification of Metallic Biomaterials for Better Tribological Properties : A Review," *Arab. J. Sci. Eng.* 42 (2017) 4493–4512.
- [77] X. Rao, J. Li, X. Feng, C. Chu, "Bone-like apatite growth on controllable macroporous titanium scaffolds coated with microporous titania," *J. Mech. Behav. Biomed. Mater.* 77 (2018) 225–233.
- [78] M. Meskinfam, S. Bertoldi, N. Albanese, a. Cerri, M.C. Tanzi, R. Imani, N. Baheiraei, M. Farokhi, S. Farè, "Polyurethane foam/nano hydroxyapatite composite as a suitable scaffold for bone tissue regeneration," *Mater. Sci. Eng. C.* 82 (2018) 130–140.
- [79] G. Tetteh, a. S. Khan, R.M. Delaine-Smith, G.C. Reilly, I.U. Rehman, "Electrospun

- polyurethane/hydroxyapatite bioactive Scaffolds for bone tissue engineering: The role of solvent and hydroxyapatite particles," *J. Mech. Behav. Biomed. Mater.* 39 (2014) 95–110.
- [80] C. Gao, B. Yang, H. Hu, J. Liu, C. Shuai, S. Peng, "Enhanced sintering ability of biphasic calcium phosphate by polymers used for bone scaffold fabrication," *Mater. Sci. Eng. C* 33 (2013) 3802–3810.
- [81] H. Jostein, M. Monjo, M. Rubert, A. Verket, S. Petter, J. Eirik, H. Jacob, J. Caspar, "Porous ceramic titanium dioxide scaffolds promote bone formation in rabbit peri-implant cortical defect model," *Acta Biomaterialia*, 9 (2013) 5390–5399.
- [82] Q. Cai, Q. Feng, H. Liu, X. Yang, "Preparation of biomimetic hydroxyapatite by biomineralization and calcination using poly (L -lactide)/ gelatin composite fibrous mat as template," *Mater. Lett.* 91 (2013) 275–278.
- [83] A. Anitha, S. Sowmya, P.T.S. Kumar, S. Deepthi, K.P. Chennazhi, H. Ehrlich, M. Tsurkan, R. Jayakumar, "Chitin and chitosan in selected biomedical applications," *Prog. Polym. Sci.* (2014) 1–24.
- [84] L. Pighinelli, M. Kucharska, "Chitosan – hydroxyapatite composites," *Carbohydr. Polym.* 93 (2013) 256–262.
- [85] E. Szymańska, K. Winnicka, "Stability of chitosan - A challenge for pharmaceutical and biomedical applications," *Mar. Drugs*. 13 (2015) 1819–1846.
- [86] T. Guo, J. Zhao, J. Chang, Z. Ding, H. Hong, J. Chen, J. Zhang, "Porous chitosan-gelatin scaffold containing plasmid DNA encoding transforming growth factor- b 1 for chondrocytes proliferation," *Biomaterials*. 27 (2006) 1095–1103.
- [87] D. Semnani, E. Naghashzargar, M. Hadjianfar, F. Dehghan Manshadi, S. Mohammadi, S. Karbasi, F. Effaty, "Evaluation of PCL/chitosan electrospun nanofibers for liver tissue engineering," *Int. J. Polym. Mater. Polym. Biomater.* 66 (2017) 149–157.
- [88] P.B. Malafaya, G.A. Silva, R.L. Reis, "Natural – origin polymers as carriers and scaffolds for biomolecules and cell delivery in tissue engineering applications ," *Advanced Drug Delivery Reviews*. 59 (2007) 207–233.

- [89] K.R. Razali, N.F.M. Nasir, E.M. Cheng, N. Mamat, M. Mazalan, Y. Wahab, M.R. Mohd, "The Effect of Gelatin and Hydroxyapatite Ratios on the Scaffolds' Porosity and Mechanical Properties," Conference on Biomedical Engineering and Science, IEEE. (2014) 8–10.
- [90] P.S.P. Poh, D.W. Hutmacher, B.M. Holzapfel, A.K. Solanki, M.M. Stevens, M.A. Woodruff, "In vitro and in vivo bone formation potential of surface calcium phosphate-coated polycaprolactone and polycaprolactone / bioactive glass composite scaffolds," *Acta Biomater.* 30 (2016) 319–333.
- [91] M. Prideaux, N. Loveridge, A.A. Pitsillides, C. Farquharson, "Extracellular Matrix Mineralization Promotes E11 / gp38 Glycoprotein Expression and Drives Osteocytic Differentiation," *PloS One.* 7 (2012) 1–11.
- [92] R. Budiraharjo, K.G. Neoh, E.T. Kang, "Journal of Colloid and Interface Science Hydroxyapatite-coated carboxymethyl chitosan scaffolds for promoting osteoblast and stem cell differentiation," *J. Colloid Interface Sci.* 366 (2012) 224–232.
- [93] B. Ecarot-charrier, F.H. Glorieux, M.V.A.N.D.E.R. Rest, G. Pereira, "Osteoblasts Isolated from Mouse Calvaria Initiate Matrix Mineralization in Culture," *Journal of Cell Biology.* 4 (1983) 639–643.
- [94] D. Puppi, F. Chiellini, a. M. Piras, E. Chiellini, "Polymeric materials for bone and cartilage repair," *Prog. Polym. Sci.* 35 (2010) 403–440.
- [95] P. Torricelli, M. Giofrè, A. Fiorani, S. Panzavolta, C. Gualandi, M. Fini, M. Letizia, A. Bigi, "Co-electrospun gelatin-poly (L -lactic acid) scaffolds : Modulation of mechanical properties and chondrocyte response as a function of composition," *Mater. Sci. Eng. C.* 36 (2014) 130–138.
- [96] Y. Dan, O. Liu, Y. Liu, Y. Zhang, S. Li, X. Feng, Z. Shao, C. Yang, "Development of Novel Biocomposite Scaffold of Chitosan-Gelatin / Nanohydroxyapatite for Potential Bone Tissue Engineering Applications," *Nanoscale Res. Lett.* (2016) 1–6.
- [97] Mehdi Nikkhah Mohsen Akbari Arghya Paul Adnan Memic Alireza Dolatshahi-Pirouz Ali Khademhosseini, "Gelatin-Based Biomaterials For Tissue Engineering And Stem Cell Bioengineering, in: N.M.N.R.L. Reis (Ed.)," *Biomater. from Nat.*

- Adv. Devices Ther. First Ed., 1st ed., wiley, 2016.
- [98] S. Dong, J. Sun, Y. Li, J. Li, W. Cui, B. Li, "Electrospun nanofibrous scaffolds of poly (L-lactic acid) -dicalcium silicate composite via ultrasonic-aging technique for bone regeneration," *Mater. Sci. Eng. C*. 35 (2014) 426–433.
- [99] T.J. Levingstone, A. Ramesh, R.T. Brady, P.A.J. Brama, C. Kearney, J.P. Gleeson, F.J.O. Brien, "Biomaterials Cell-free multi-layered collagen-based scaffolds demonstrate layer specific regeneration of functional osteochondral tissue in caprine joints," *Biomaterials*. 87 (2016) 69–81.
- [100] J. Won, Y. Yun, J. Jang, S. Yang, J. Kim, W. Chrzanowski, I.B. Wall, J.C. Knowles, H. Kim, "Biomaterials Multifunctional and stable bone mimic proteinaceous matrix for bone tissue engineering," *Biomaterials*. 56 (2015) 46–57.
- [101] D. Mishra, B. Bhunia, I. Banerjee, P. Datta, S. Dhara, T.K. Maiti, "Enzymatically crosslinked carboxymethyl – chitosan / gelatin / nano-hydroxyapatite injectable gels for in situ bone tissue engineering application," *Mater. Sci. Eng. C*. 31 (2011) 1295–1304.
- [102] F.F. Azhar, A. Olad, R. Salehi, "Fabrication and characterization of chitosan – gelatin / nanohydroxyapatite – polyaniline composite with potential application in tissue engineering scaffolds," *Des. Monomers Polym.* 17 (2014) 654–667.
- [103] P. Chocholata, V. Kulda, V. Babuska, "Fabrication of Scaffolds for Bone-Tissue Regeneration," *Materials (Basel)*. 12 (2019) 1–25.
- [104] S. Panzavolta, P. Torricelli, S. Casolari, A. Parrilli, M. Fini, A. Bigi, "Strontium-Substituted Hydroxyapatite-Gelatin Biomimetic Scaffolds Modulate Bone Cell Response," *Macromolecular Biosciences*. 18 (2018) 1–10.
- [105] M. Azami, R. Mohammad, "Gelatin / hydroxyapatite nanocomposite scaffolds for bone repair," *Society of Plastic Engineers* (2011) 7–8.
- [106] R. Yunus, S.K.T. S, M. Doble, "Design of biocomposite materials for bone tissue regeneration," *Mater. Sci. Eng. C*. 57 (2015) 452–463.
- [107] N. Kim, T. Thanh, P. Hung, "Colloids and Surfaces B : Biointerfaces Biomimetic

- scaffolds based on hydroxyapatite nanorod / poly (d , l) lactic acid with their corresponding apatite-forming capability and biocompatibility for bone-tissue engineering," *Colloids Surfaces B Biointerfaces*. 128 (2015) 506–514.
- [108] A.L. Butcher, C.T. Koh, M.L. Oyen, " Systematic mechanical evaluation of electrospun gelatin meshes," *J. Mech. Behav. Biomed. Mater.* 69 (2017) 412–419.
- [109] B. Torabinejad, J. Mohammadi-rovshandeh, S. Mohammad, A. Zamanian, "Synthesis and characterization of nanocomposite scaffolds based on triblock copolymer of L -lactide , ϵ -caprolactone and nano-hydroxyapatite for bone tissue engineering," *Mater. Sci. Eng. C*. 42 (2014) 199–210.
- [110] H. Park, B. Choi, J. Nguyen, J. Fan, S. Shafi, P. Klokkevold, M. Lee, "Anionic carbohydrate-containing chitosan scaffolds for bone regeneration," *Carbohydr. Polym.* 97 (2013) 587–596.
- [111] H. Ch, G. Scaffold, J.C. Forero, N. Osses, "Development of Useful Biomaterial for Bone Tissue Engineering by Incorporating Nano-Copper-Zinc," *Materials (Basel)*. 10 (2017) 1–15.
- [112] K. Fatima, B. Hossain, T. Sikder, M. Rahman, K. Uddin, M. Kurasaki, "Investigation of Chromium Removal Efficacy from Tannery Effluent by Synthesized Chitosan from Crab Shell," *Arab. J. Sci. Eng.* 42 (2017) 1569–1577.
- [113] I. Sabree, J.E. Gough, B. Derby, "Mechanical properties of porous ceramic scaffolds : In fl uence of internal dimensions," *Ceram. Int.* 41 (2015) 8425–8432.
- [114] A. Chavez-valdez, A. Arizmendi-morquecho, K.J. Moreno, J.A. Roether, J. Kaschta, A.R. Boccaccini, "Composites : Part B TiO₂ – PLLA nanocomposite coatings and free-standing films by a combined electrophoretic deposition-dip coating process," *Compos. PART B*. 67 (2014) 256–261.
- [115] S.P. Nukavarapu, D.L. Dorceumus, "Osteochondral tissue engineering : Current strategies and challenges," *Biotechnol. Adv.* 31 (2013) 706–721.
- [116] A. Nandakumar, A. Barradas, J. de Boer, L. Moroni, C. van Blitterswijk, P. Habibovic, "Combining technologies to create bioactive hybrid scaffolds for bone tissue engineering," *Biomatter*. 3 (2013).

- [117] M. Alizadeh, F. Abbasi, A.B. Khoshfetrat, H. Ghaleh, "Microstructure and characteristic properties of gelatin / chitosan scaffold prepared by a combined freeze-drying / leaching method," *Mater. Sci. Eng. C.* 33 (2013) 3958–3967.
- [118] C. Mu, Y. Hu, L. Huang, X. Shen, M. Li, L. Li, H. Gu, Y. Yu, Z. Xia, K. Cai, "Sustained raloxifene release from hyaluronan-alendronate-functionalized titanium nanotube arrays capable of enhancing osseointegration in osteoporotic rabbits," *Mater. Sci. Eng. C.* 82 (2018) 345–353.
- [119] B. Langelier, X. Wang, K. Grandfield, "Atomic scale chemical tomography of human bone," *Nat. Publ. Gr.* (2017) 1–9.
- [120] D. Semnani, "A novel model of optimum nanofibre distribution in nanofibre scaffold structure by genetic algorithm method.," *J. Exp. Nanosci.* 9 (2014) 966–981.
- [121] A.K. Jaiswal, S.S. Kadam, V.P. Soni, J.R. Bellare, "Applied Surface Science Improved functionalization of electrospun PLLA / gelatin scaffold by alternate soaking method for bone tissue engineering," *Appl. Surf. Sci.* 268 (2013) 477–488.
- [122] C. Sharma, A. Kumar, P.D. Potdar, C. Chou, N. Chandra, "Fabrication and characterization of novel nano-biocomposite scaffold of chitosan – gelatin – alginate – hydroxyapatite for bone tissue engineering," *Mater. Sci. Eng. C.* 64 (2016) 416–427.
- [123] J. Wang, D. Li, T. Li, J. Ding, J. Liu, B. Li, X. Chen, "Gelatin Tight-Coated Poly(lactide-co-glycolide) Scaffold Incorporating rhBMP-2 for Bone Tissue Engineering," *Materials (Basel).* 8 (2015) 1009–1026.
- [124] S.L.L. and M. Zhang, "Chitosan-based scaffolds for bone tissue engineering," *J Mater Chem B Mater Biol Med.* 2 (2015) 3161–3184.
- [125] E.G. Molly M.Gentleman, "The role of surface free energy in osteoblast–biomaterial interactions," *Int. Mater. Rev.* 59 (2014) 417–429.
- [126] K. Kwak, A. Jyoti, H. Song, "Applied Surface Science In vitro and in vivo studies of three dimensional porous composites of biphasic calcium phosphate / poly ϵ - caprolactone : Effect of bio-functionalization for bone tissue engineering," *Appl. Surf. Sci.* 301 (2014) 307–314.

- [127] J. He, X. Yang, J. Mao, F. Xu, Q. Cai, "Applied Surface Science Hydroxyapatite – poly (l -lactide) nanohybrids via surface-initiated ATRP for improving bone-like apatite-formation abilities," *Appl. Surf. Sci.* 258 (2012) 6823–6830.
- [128] K. Zhang, Y. Fan, N. Dunne, X. Li, "Effect of microporosity on scaffolds for bone tissue engineering," *Regen. Biomater.* (2018) 115–124.
- [129] H. Ueno, T.J. Fujimi, I. Okada, M. Aizawa, "Development of biocompatible apatite sheets with various Ca/P ratios and carbonate ion contents for mouse osteoblastic cell culture and their evaluations," *J. Aust. Ceram. Soc.* 46 (2010) 14–18.
- [130] T. Kim, Y. Min, D. Kim, H. Jin, K. Shin, J. Sup, H. Park, S. Yoon, "In situ formation of biphasic calcium phosphates and their biological performance in vivo," *Ceram. Int.* 38 (2012) 1965–1974.
- [131] B. Kruppke, C. Heinemann, A. Keroue, J. Thomas, S. Ro, H. Wiesmann, T. Gemming, H. Worch, T. Hanke, "Calcite and Hydroxyapatite Gelatin Composites as Bone Substitution Material Made by the Double Migration Technique," *Crystal Growth and Design.* 17(2017) 738-745.
- [132] L. Nie, D. Chen, J. Suo, P. Zou, S. Feng, Q. Yang, S. Yang, S. Ye, "Colloids and Surfaces B : Biointerfaces Physicochemical characterization and biocompatibility in vitro of biphasic calcium phosphate / polyvinyl alcohol scaffolds prepared by freeze-drying method for bone tissue engineering applications," *Colloids Surfaces B Biointerfaces.* 100 (2012) 169–176.
- [133] P. Riches, L. Jia, G. Turnbull, J. Clarke, F. Han, B. Li, W. Shu, "3D bioactive composite scaffolds for bone tissue engineering d e," *Bioact. Mater.* 3 (2018) 278–314.
- [134] S.F. Bone, "Isolation and Characterization of Nano-Hydroxyapatite from Salmon Fish Bone, " *Materials.* 8(2015) 5426–5439.
- [135] Q. Ao, A. Wang, Y. Gong, X. Zhang, "Preparation and Characterization of a Multilayer Biomimetic Scaffold for Bone Tissue Enguneering," *J. Biomater. Appl.* (2007).
- [136] C. Kailasanathan, N. Selvakumar, V. Naidu, "Structure and properties of titania

- reinforced nano-hydroxyapatite / gelatin bio-composites for bone graft materials," *Ceram. Int.* 38 (2012) 571–579.
- [137] J.H. Muyonga, "Food Chemistry Fourier transform infrared (FTIR) spectroscopic study of acid soluble collagen and gelatin from skins and bones of young and adult Nile perch (*Lates niloticus*)," *Food Chemistry*. 86 (2004) 325–332.
- [138] A. Rogina, M. Ivankovi, H. Ivankovi, "Preparation and characterization of nano-hydroxyapatite within chitosan matrix," 33 (2013) 4539–4544.
- [139] N. Bhardwaj, S.C. Kundu, "Electrospinning: A fascinating fiber fabrication technique," *Biotechnol. Adv.* 28 (2010) 325–347.
- [140] S. Fu, P. Ni, B. Wang, B. Chu, J. Peng, L. Zheng, X. Zhao, F. Luo, Y. Wei, Z. Qian, "Biomaterials In vivo biocompatibility and osteogenesis of electrospun poly (ϵ -caprolactone) e poly (ethylene glycol) e poly (ϵ -caprolactone)/ nano-hydroxyapatite composite scaffold," *Biomaterials*. 33 (2012) 8363–8371.
- [141] L. Roseti, V. Parisi, M. Petretta, C. Cavallo, G. Desando, I. Bartolotti, B. Grigolo, "Scaffolds for Bone Tissue Engineering : State of the art and new perspectives," *Mater. Sci. Eng. C*. 78 (2017) 1246–1262.
- [142] S. Huang, Z. Chen, N. Pugno, Q. Chen, W. Wang, "A novel model for porous scaffold to match the mechanical anisotropy and the hierarchical structure of bone," *Mater. Lett.* 122 (2014) 315–319.
- [143] S. Teixeira, M.A. Rodriguez, P. Pena, A.H. De Aza, S. De Aza, M.P. Ferraz, F.J. Monteiro, "Physical characterization of hydroxyapatite porous scaffolds for tissue engineering," *Mater. Sci. Eng. C*. 29 (2009) 1510–1514..
- [144] J. Yan, Y. Miao, H. Tan, T. Zhou, Z. Ling, Y. Chen, X. Xing, X. Hu, "Injectable alginate / hydroxyapatite gel scaffold combined with gelatin microspheres for drug delivery and bone tissue engineering," *Mater. Sci. Eng. C*. 63 (2016) 274–284.
- [145] D.M. Escobar-sierra, J. Martins, C.P. Ossa-, "Chitosan / hydroxyapatite scaffolds for tissue engineering manufacturing method effect comparison," *Rev. Fac. Ing. Univ. Antioquia N* (2015) 24–35.

- [146] F. Baino, C. Vitale-brovarone, "Mechanical properties and reliability of glass – ceramic foam scaffolds for bone repair," *Mater. Lett.* 118 (2014) 27–30.
- [147] F. Alisafaei, C. Han, "Indentation Depth Dependent Mechanical Behavior in Polymers," *Advances in Condensed Matter Physics* .2015 (2015)1-20.
- [148] S.-C. Wu, H.-C. Hsu, S.-K. Hsu, W.-H. Wang, W.-F. Ho, "Preparation and characterization of four different compositions of calcium phosphate scaffolds for bone tissue engineering," *Mater. Charact.* 62 (2011) 526–534.
- [149] S. Ching, M. Wang, N. Pai, S. Yen, "Preparation and characterization of gelatin – hydroxyapatite composite microspheres for hard tissue repair," *Mater. Sci. Eng. C.* 57 (2015) 113–122.
- [150] J. Shi, J. Yang, L. Zhu, Z. Li, X. Wang, "A Porous Scaffold Design Method for Bone Tissue Engineering Using Triply Periodic Minimal Surfaces, " *IEEE Access.* 6 (2018) 1015–1022.
- [151] I. Armentano, M. Dottori, E. Fortunati, S. Mattioli, J.M. Kenny, "Biodegradable polymer matrix nanocomposites for tissue engineering : A review," *Polym. Degrad. Stab.* 95 (2010) 2126–2146.
- [152] S.B. Qasim, S. Husain, Y. Huang, M. Pogorielov, V. Deineka, M. Lyndin, A. Rawlinson, I. Ur, "In- vitro and in -vivo degradation studies of freeze gelled porous chitosan composite scaffolds for tissue engineering applications," *Polym. Degrad. Stab.* 136 (2017) 31–38.
- [153] A. Shavandi, A.E.A. Bekhit, Z. Sun, A. Ali, M. Gould, "A novel squid pen chitosan / hydroxyapatite / β -tricalcium phosphate composite for bone tissue engineering," *Mater. Sci. Eng. C.* 55 (2015) 373–383.
- [154] N. Johari, H.R. Madaah Hosseini, A. Samadikuchaksaraei, "Novel fluoridated silk fibroin/ TiO₂nanocomposite scaffolds for bone tissue engineering," *Mater. Sci. Eng. C.* 82 (2018) 265–276.
- [155] Y. Pu, Y. Huang, S. Qi, C. Chen, H.J. Seo, "In situ hydroxyapatite nanofiber growth on calcium borate silicate ceramics in SBF and its structural characteristics," *Mater. Sci. Eng. C.* 55 (2015) 126–130.

- [156] E.J. Sheehy, T. Vinardell, C.T. Buckley, D.J. Kelly, "Engineering osteochondral constructs through spatial regulation of endochondral ossification," *Acta Biomater.* 9 (2013) 5484–5492.
- [157] H. Bouchemel, A. Benchettara, "Corrosion Behavior of a New Ti – 3Mo Alloy in Simulated Body Fluid for Biomedical Applications," *Arabian Journal of Science and Engineering.* 39 (2014) 139–146.
- [158] P. Deb, A.B. Deoghare, "Effect of Acid , Alkali and Alkali – Acid Treatment on Physicochemical and Bioactive Properties of Hydroxyapatite Derived from *Catla catla* Fish Scales," *Arab. J. Sci. Eng.* (2019) 1–12.
- [159] C.V.M. Rodrigues, P. Serricella, A.B.R. Linhares, R.M. Guerdes, R. Borojevic, "Characterization of a bovine collagen – hydroxyapatite composite scaffold for bone tissue engineering," 24 (2003) 4987–4997.
- [160] R. Florencio-silva, G. Rodrigues, E. Sasso-cerri, M.J. Simões, P.S. Cerri, B. "Cells, Biology of Bone Tissue : Structure , Function , and Factors That Influence Bone Cells," *Biomedical Res. Int.* 2015 (2015) 1–17.
- [161] N. Maruotti, A. Corrado, F.P. Cantatore, "Osteoblast role in osteoarthritis pathogenesis," (2017) 2957–2963.
- [162] R. Detsch, A.R. Boccaccini, "The role of osteoclasts in bone tissue engineering," (2015) 1133–1149.
- [163] L.F. Bonewald, *J BMR The Amazing Osteocyte*, 26 (2011) 229–238.
- [164] S.R. Goldring, *The osteocyte : key player in regulating bone turnover*, 1 (2015) 1–4.
- [165] T. Hamada, *Surface Markers And Gene Expression To Characterize The Differentiation Of Monolayer Expanded Human Articular*," *Nagoya Journal of Medical Science.* 2111 (2013) 101–111.
- [166] K. Baghaei, S.M. Hashemi, S. Tokhanbigli, A.A. Rad, H. Assadzadeh-, A. Sharifian, M.R. Zali, "Isolation , differentiation , and characterization of mesenchymal stem cells from human bone marrow," 10 (2017) 208–213.
- [167] H. Li, R. Ghazanfari, D. Zacharaki, H.C. Lim, S. Scheduling, "Isolation and

- characterization of primary bone marrow mesenchymal stromal cells," 1370 (2016) 109–118.
- [168] W.W. Thein-han, J. Saikhun, C. Pholpramoo, R.D.K. Misra, Y. Kitiyanant, "Chitosan – gelatin scaffolds for tissue engineering : Physico-chemical properties and biological response of buffalo embryonic stem cells and transfectant of GFP – buffalo embryonic stem cells," *Acta Biomater.* 5 (2009) 3453–3466.
- [169] A. Koç Demir, "Development and characterization of zinc-incorporated montmorillonite/poly(ϵ -caprolactone) composite scaffold for osteogenic tissue-engineering applications," *Polym. Compos.* (2018) 1-8.
- [170] D. Li, C. Ye, Y. Zhu, Y. Qi, Z. Gou, C. Gao, "Fabrication of poly(lactide-co-glycolide) scaffold embedded spatially with hydroxyapatite particles on pore walls for bone tissue engineering," *Polym. Adv. Technol.* 23 (2012) 1446–1453.
- [171] L. Chen, K. Shi, C.E. Frary, N. Ditzel, H. Hu, W. Qiu, M. Kassem, "Inhibiting actin depolymerization enhances osteoblast differentiation and bone formation in human stromal stem cells," *Stem Cell Res.* 15 (2015) 281–289.
- [172] C.J. Kowalczewski, J.M. Saul, "Biomaterials for the delivery of growth factors and other therapeutic agents in tissue engineering approaches to bone regeneration," *Front. Pharmacol.* 9 (2018) 1–15.
- [173] D. Gothard, E.L. Smith, J.M. Kanczler, H. Rashidi, O. Qutachi, J. Henstock, M. Rotherham, A. El Haj, K.M. Shakesheff, R.O.C. Oreffo, "Tissue engineered bone using select growth factors: A comprehensive review of animal studies and clinical translation studies in man," *Eur. Cells Mater.* 28 (2014) 166–208.
- [174] C. Kowalczewski, J.Saul, "Biomaterials for the delivery of growth factors and other therapeutic agents in tissue engineering approaches to bone regeneration, " *Frontiers in Pharmacology.* (2018).
- [175] J. Park, S. Kim, K. Kim, "Bone morphogenetic protein-2 associated multiple growth factor delivery for bone tissue regeneration," *J. Pharm. Investig.* 48 (2018) 187–197.
- [176] K.A. Blackwood, N. Bock, T.R. Dargaville, M. Ann Woodruff, "Scaffolds for growth factor delivery as applied to bone tissue engineering," *Int. J. Polym. Sci.*

- 2012 (2012).
- [177] F. Dunn, R. Baron, G. Rawadi, "BMP-2 Controls Alkaline Phosphatase Expression and Osteoblast Mineralization by a Wnt Autocrine Loop," *J. Bone Miner. Res.* 18 (2003) 1842–1853.
- [178] R.R. Lareu, D.I. Zeugolis, M. Abu-rub, A. Pandit, M. Raghunath, *Acta Biomaterialia* Essential modification of the Sircol Collagen Assay for the accurate quantification of collagen content in complex protein solutions," 6 (2010) 3146–3151.
- [179] K. Atesok, M.N. Doral, J. Karlsson, K.A. Egol, L.M. Jazrawi, P.G. Coelho, A. Martinez, T. Matsumoto, B.D. Owens, M. Ochi, S.R. Hurwitz, A. Atala, F.H. Fu, H.H. Lu, S.A. Rodeo, "Multilayer scaffolds in orthopaedic tissue engineering, *Knee Surgery*," *Sport. Traumatol. Arthrosc.* 24 (2016) 2365–2373.
- [180] S.H. Chen, C.C. Wu, S.H. Wang, W.T. Li, "Growth and differentiation of osteoblasts regulated by low-intensity pulsed ultrasound of various exposure durations," *J. Med. Biol. Eng.* 34 (2014) 197–203.
- [181] X. Bai, M. Gao, S. Syed, J. Zhuang, X. Xu, X. Zhang, *Bioactive Materials* Bioactive hydrogels for bone regeneration, *Bioact. Mater.* 3 (2018) 401–417.
- [182] P. Riches, L. Jia, G. Turnbull, J. Clarke, F. Han, B. Li, W. Shu, "3D bioactive composite scaffolds for bone tissue engineering," *Bioactive Materials* , 3 (2018) 278–314.
- [183] M. Kazemi, M. Azami, B. Johari, "Bone Regeneration in rat using a gelatin / bioactive glass nanocomposite scaffold along with endothelial cells (HUVECs)," *Applied ceramic technology*.15(2018) 1427–1438.
- [184] K.M. Panchalingam, S. Jung, L. Rosenberg, L.A. Behie, "Bioprocessing strategies for the large-scale production of human mesenchymal stem cells : a review," *Stem Cell Res. Ther.* (2015) 1–10.
- [185] S. Ramesh, S. Adzila, C.K.L. Jeffrey, C.Y. Tan, J. Purbolaksono, A.M. Noor, M.A. Hassan, I. Sopyan, W.D. Teng, "Properties of hydroxyapatite synthesized by wet chemical method," *J. Ceram. Process. Res.* 14 (2013) 448–452.

- [186] C. Valencia, C.H. Valencia, F. Zuluaga, M.E. Valencia, J.H. Mina, C.D. Grandetovar, "Synthesis and Application of Scaffolds of Chitosan-Graphene Oxide by the Freeze-Drying Method for Tissue Regeneration," *Molecules*. 23 (2018) 1–16.
- [187] Haaparanta, Anne-Marie, "Highly Porous Freeze-Dried Composite Scaffolds for Cartilage and Osteochondral Tissue Engineering", Ph.D Thesis, Tampere University of Technology, Finland, 2015.
- [188] H. Kim, J.C. Knowles, H. Kim, "Porous Scaffolds of Gelatin – Hydroxyapatite Nanocomposites Obtained by Biomimetic Approach: Characterization and Antibiotic Drug Release," *Journal of Biomedical materials research. Part B, Applied Biomaterials*. 74 (2005) 686–698.
- [189] H. Declercq, N. Van Den Vreken, E. De Maeyer, R. Verbeeck, E. Schacht, L. De Ridder, M. Cornelissen, "Isolation, proliferation and differentiation of osteoblastic cells to study cell/biomaterial interactions: Comparison of different isolation techniques and source," *Biomaterials*. 25 (2004) 757–768.
- [190] D.A. Moraes, T.T. Sibov, L.F. Pavon, P.Q. Alvim, R.S. Bonadio, J.R. Da Silva, A. Pic-taylor, O.A. Toledo, L.C. Marti, R.B. Azevedo, D.M. Oliveira, "A reduction in CD90 (THY-1) expression results in increased differentiation of mesenchymal stromal cells," *Stem Cell Res. Ther.* 90 (2016) 1–14.
- [191] A.R. Armiento, M. Alini, M.J. Stoddart, "Articular fibrocartilage - Why does hyaline cartilage fail to repair ? ," *Advanced Drug Delivery Reviews* (2018) .
- [192] A. Somal, I.A. Bhat, B. Indu, S. Pandey, B.S.K. Panda, "A Comparative Study of Growth Kinetics , In Vitro Differentiation Potential and Molecular Characterization of Fetal Adnexa Derived Caprine Mesenchymal Stem Cells," *PLoS One*. (2016) 1–17.
- [193] C. et al Heinemann, "Development of an osteoblast/osteoclast co-culture derived by human bone marrow stromal cells and human monocytes for biomaterials testing.," *Eur. Cell. Mater.* 21 (2011) 80–93.
- [194] F.J. O'Brien, "Biomaterials & scaffolds for tissue engineering," *Mater. Today*. 14 (2011) 88–95.

- [195] F. Darus, R. Isa, N. Mamat, M. Jaafar, Techniques for fabrication and construction of three-dimensional bioceramic scaffolds: Effect on pores size, porosity and compressive strength," *Ceram. Int.* 44 (2018) 18400–18407.
- [196] M. Farokhi, F. Mottaghitalab, S. Samani, M.A. Shokrgozar, S.C. Kundu, R.L. Reis, Y. Fatahi, D.L. Kaplan, "Silk fibroin / hydroxyapatite composites for bone tissue engineering," *Biotechnol. Adv.* 36 (2018) 68–91.
- [197] M.W. Pfaffl, "A new mathematical model for relative quantification in real-time RT-PCR.," *Nucleic Acids Res.* 29 (2001) e45.
- [198] C. Content, K.A. Athanasiou, J.M. Link, J.C. Hu, A Modified Hydroxyproline Assay Based on Hydrochloric Acid in Ehrlich's Solution Accurately Measures Tissue Collagen content" *Tissue Engineering. Part C, Methods.*, 23 (2017) 243–250.
- [199] R. Krishna, Z. Jiang, P. Chapman, X. Le, N. Mondinos, D. Fawcett, G. Eddy, J. Poinern, "Ultrasonics Sonochemistry Effect of dilute gelatine on the ultrasonic thermally assisted synthesis of nano hydroxyapatite," *Ultrason. - Sonochemistry.* 18 (2011) 697–703.
- [200] J.A. Sowjanya, J. Singh, T. Mohita, S. Sarvanan, A. Moorthi, N. Srinivasan, N. Selvamurugan, "Colloids and Surfaces B: Biointerfaces Biocomposite scaffolds containing chitosan / alginate / nano-silica for bone tissue engineering," *Colloids Surfaces B Biointerfaces.* 109 (2013) 294–300.
- [201] P. Yu, R. Bao, X. Shi, W. Yang, M. Yang, "oxide / chitosan composite hydrogel for bone tissue engineering," *Carbohydr. Polym.* 155 (2017) 507–515.
- [202] W. Lu, M. Ma, H. Xu, B. Zhang, X. Cao, Y. Guo, "Gelatin nanofibers prepared by spiral-electrospinning and cross-linked by vapor and liquid-phase glutaraldehyde," *Mater. Lett.* 140 (2015) 1–4.
- [203] A. Shavandi, A.E.A. Bekhit, M.A. Ali, Z. Sun, M. Gould, "Development and characterization of hydroxyapatite / β -TCP / chitosan composites for tissue engineering applications," *Mater. Sci. Eng. C.* 56 (2015) 481–493.
- [204] M. Hwan, C. Yun, E. Paul, Y. Wook, H. Wook, S. Park, W. Jung, J. Oh, S. Yun, "Quantitative analysis of the role of nanohydroxyapatite (nHA) on 3D-printed PCL

- / nHA composite scaffolds," *Mater. Lett.* 220 (2018) 112–115.
- [205] J. Ran, J. Hu, L. Chen, X. Shen, H. Tong, "Preparation and Characterization of Gelatin / Hydroxyapatite Nanocomposite for Bone Tissue Engineering," *Polymer Composites*. 38 (2017) 1579-1590.
- [206] S. Mobini, J. Javadpour, M. Hosseinalipour, A. Khavandi, H.R. Rezaie, J. Javadpour, M. Hosseinalipour, S. Mobini, J. Javadpour, M. Hosseinalipour, "Synthesis and characterisation of gelatin – nano hydroxyapatite composite scaffolds for bone tissue engineering," *Advances in applied ceramics*.107(2013),4-8.
- [207] H. Kim, G. Jung, J. Yoon, J. Han, Y. Park, D. Kim, M. Zhang, D. Kim, "Preparation and characterization of nano-sized hydroxyapatite / alginate / chitosan composite scaffolds for bone tissue engineering," *Mater. Sci. Eng. C*. 54 (2015) 20–25.
- [208] K.S. Katti, D.R. Katti, R. Dash, Comparison on mechanical properties of single layered and bilayered chitosan-gelatin coated porous hydroxyapatite scaffold prepared through freeze drying method, *IOP Material Science and Engineering* .172, 2017,1-8.
- [209] M.M. Figueiredo, J.A.F. Gamelas, A.G. Martins, "Characterization of Bone and Bone-Based Graft Materials Using FTIR Spectroscopy, *Infrared Spectrosc.* "- *Life Biomed. Sci.* (2012).
- [210] R. Ke, W. Yi, S. Tao, Y. Wen, Z. Hongyu, "Electrospun PCL / gelatin composite nano fiber structures for effective guided bone regeneration membranes," *Mater. Sci. Eng. C*. 78 (2017) 324–332.
- [211] T.J. Levingstone, A. Matsiko, G.R. Dickson, F.J.O. Brien, J.P. Gleeson, "A biomimetic multi-layered collagen-based scaffold for osteochondral repair," *Acta Biomater.* 10 (2014) 1996–2004.
- [212] S. Eftekhari, I. El, Z. Shaghayegh, G. Turcotte, H. Bougherara, "Fabrication and characterization of novel biomimetic PLLA / cellulose / hydroxyapatite nanocomposite for bone repair applications," *Mater. Sci. Eng. C*. 39 (2014) 120–125.
- [213] X. Peng, M. Hu, F. Liao, F. Yang, Q. Ke, Y. Guo, Z. Zhu, "La-Doped mesoporous

- calcium silicate/chitosan scaffolds for bone tissue engineering," *Biomater. Sci.* (2019) 1–9.
- [214] M.R. Nikpour, S.M. Rabiee, M. Jahanshahi, "Composites : Part B Synthesis and characterization of hydroxyapatite / chitosan nanocomposite materials for medical engineering applications," *Compos. Part B.* 43 (2012) 1881–1886.
- [215] J. Lou, R. Stowers, S. Nam, Y. Xia, O. Chaudhuri, "Biomaterials Stress relaxing hyaluronic acid-collagen hydrogels promote cell spreading , fi ber remodeling , and focal adhesion formation in 3D cell culture," *Biomaterials.* 154 (2018) 213–222.
- [216] J. Venkatesan, S. Kim, "Chitosan Composites for Bone Tissue Engineering — An Overview," *Mar. Drugs.* 8 (2014) 2252–2266.
- [217] A.B. Susmita Bose, Mangal Roy, S. Bose, M. Roy, A. Bandyopadhyay, "Recent advances in bone tissue engineering scaffolds," *Trends Biotechnol.* 30 (2012) 546–554.
- [218] A.N. Hayati, H.R. Rezaie, S.M. Hosseinalipour, "Preparation of poly (3-hydroxybutyrate)/ nano-hydroxyapatite composite scaffolds for bone tissue engineering," *Mater. Lett.* 65 (2011) 736–739.
- [219] S. Wu, X. Liu, K.W.K. Yeung, C. Liu, X. Yang, "Biomimetic porous scaffolds for bone tissue engineering," *Mater. Sci. Eng. R.* 80 (2014) 1–36.
- [220] N. Yadav, P. Srivastava, "In vitro studies on gelatin/hydroxyapatite composite modified with osteoblast for bone bioengineering," *Heliyon.* 5 (2019).
- [221] W. Wattanuchariya, W. Changkowchai, Characterization of Porous Scaffold from Chitosan - Gelatin / Hydroxyapatite for Bone Grafting,IMECS II, 2014, 1-5 .
- [222] F. Han, Y. Dong, Z. Su, R. Yin, A. Song, S. Li, "Preparation , characteristics and assessment of a novel gelatin – chitosan sponge scaffold as skin tissue engineering material," *Int. J. Pharm.* 476 (2014) 124–133.
- [223] M. Shakir, R. Jolly, M.S. Khan, A. Rauf, S. Kazmi, "Nano-hydroxyapatite/ β -CD/chitosan nanocomposite for potential applications in bone tissue engineering," *Int. J. Biol. Macromol.* 93 (2016) 276–289.

- [224] I.R. Serra, R. Fradique, M.C.S. Vallejo, T.R. Correia, S.P. Miguel, I.J. Correia, "Production and characterization of chitosan / gelatin / β -TCP scaffolds for improved bone tissue regeneration," *Mater. Sci. Eng. C*. 55 (2015) 592–604.
- [225] G. Pelizzo, M.A. Avanzini, A. Icaro Cornaglia, M. Osti, P. Romano, L. Avolio, R. Maccario, M. Dominici, A. De Silvestri, E. Andreatta, F. Costanzo, M. Mantelli, D. Ingo, S. Piccinno, V. Calcaterra, "Mesenchymal stromal cells for cutaneous wound healing in a rabbit model: Pre-clinical study applicable in the pediatric surgical setting," *J. Transl. Med.* 13 (2015) 1–14.
- [226] S.L. Piotrowski, L. Wilson, N. Dharmaraj, A. Hamze, A. Clark, R. Taylor, L.R. Hill, S. Lai, F.K. Kasper, S. Young, "Development and Characterization of a Rabbit Model of Compromised Maxillofacial Wound Healing," *Tissue Eng. Part C Methods*. 25 (2019) 160–167.
- [227] N. Yadav, P. Srivastava, "Osteoblast studied on gelatin based biomaterials in rabbit Bone Bioengineering," *Mater. Sci. Eng. C*. 104 (2019).
- [228] C. Campagnoli, I.A.G. Roberts, S. Kumar, P.R. Bennett, I. Bellantuono, N.M. Fisk, "Identification of mesenchymal stem / progenitor cells in human first-trimester fetal blood , liver , and bone marrow," *Blood*. 98 (2001) 2396–2403.
- [229] B.M. Abdallah, A. Al-Shammary, P. Skagen, R. Abu Dawud, J. Adjaye, A. Aldahmash, M. Kassem, "CD34 defines an osteoprogenitor cell population in mouse bone marrow stromal cells," *Stem Cell Res.* 15 (2015) 449–458.
- [230] K. Maji, S. Dasgupta, K. Pramanik, A. Bissoyi, "Preparation and Evaluation of Gelatin-Chitosan-Nanobioglass 3D Porous Scaffold for Bone Tissue Engineering," *International Journal of Biomaterials*, 2016 (2016) 1-14.
- [231] C. Zhou, C. Deng, X. Chen, X. Zhao, Y. Chen, Y. Fan, X. Zhang, "Mechanical and biological properties of the micro- / nano-grain functionally graded hydroxyapatite bioceramics for bone tissue engineering," *J. Mech. Behav. Biomed. Mater.* 48 (2015) 1–11.
- [232] M. Kittaka, M. Kajiya, H. Shiba, M. Takewaki, T.Q. Nguyen, K. Ouhara, K. Takeda, Clumps of a mesenchymal stromal cell / extracellular matrix complex can be a novel

- tissue engineering therapy for bone regeneration, *J. Cytotherapy*. (2015).
- [233] L.E. Rustom, T. Boudou, S. Lou, I. Pignot-paintrand, Europe PMC Funders Group
Micropore-induced Capillarity Enhances Bone Distribution in vivo in Biphasic
Calcium Phosphate Scaffolds," *Acta Biomaterialia* (2017) 144–154.
- [234] Christer Busch, Method and means for culturing osteoblastic cells, 201000808836
2016.
- [235] S. Wen, K. Hung, K. Hsieh, C. Chen, C. Tsai, S. Hsu, "In vitro and in vivo evaluation
of chitosan – gelatin scaffolds for cartilage tissue engineering," *Mater. Sci. Eng. C*.
33 (2013) 2855–2863.
- [236] I.C. Carvalho, H.S. Mansur, "Engineered 3D-scaffolds of photocrosslinked
chitosan-gelatin hydrogel hybrids for chronic wound dressings and regeneration,"
Mater. Sci. Eng. C. 78 (2017) 690–705.
- [237] M. Nieto-suárez, M.A. López-quintela, M. Lazzari, "Preparation and
characterization of crosslinked chitosan / gelatin scaffolds by ice segregation
induced self-assembly," *Carbohydr. Polym.* 141 (2016) 175–183.
- [238] A. Olad, F.F. Azhar, "The synergetic effect of bioactive ceramic and nanoclay on
the properties of chitosan – gelatin / nanohydroxyapatite – montmorillonite scaffold
for bone tissue engineering," *Ceram. Int.* 40 (2014) 10061–10072.
- [239] K.R. Mohamed, H.H. Beherei, Z.M. El-Rashidy, "In vitro study of nano-
hydroxyapatite/chitosan-gelatin composites for bio-applications," *J. Adv. Res.* 5
(2014) 201–208.
- [240] M.G. Raucci, U.D. Amora, A. Ronca, C. Demitri, L. Ambrosio, "Bioactivation
Routes of Gelatin-Based Scaffolds to Enhance at Nanoscale Level Bone Tissue
Regeneration," 7 (2019) 1–11.
- [241] G. Aliborzi, A. Vahdati, D. Mehrabani, S.E. Hosseini, A. Tamadon, "Isolation ,
Characterization and Growth Kinetic Comparison of Bone Marrow and Adipose
Tissue Mesenchymal Stem Cells of Guinea Pig," *Int. J. Stem Cells.* 9 (2016) 115–
123.

- [242] S.R. Motamedian, S. Hosseinpour, M.G. Ahsaie, A. Khojasteh, "Smart scaffolds in bone tissue engineering : A systematic review of literature, 7 (2015) 657–668. [243] N. Ye, S. Suttapreyasri, S. Kamolmatyakul, ScienceDirect Comparative study of different centrifugation protocols for a density gradient separation media in isolation of osteoprogenitors from bone marrow aspirate," *JOBCR*. 4 (2014) 160–168.
- [244] J. Sun, J. Li, C. Li, Y. Yu, "Role of bone morphogenetic protein-2 in osteogenic differentiation of mesenchymal stem cells," *Molecular Medicine Reports* (2015) 4230–4237.
- [245] D. Jing, M. Zhai, S. Tong, F. Xu, J. Cai, G. Shen, Y. Wu, X. Li, K. Xie, J. Liu, Q. Xu, E. Luo, "Pulsed electromagnetic fields promote osteogenesis and osseointegration of porous titanium implants in bone defect repair through a Wnt/ β -catenin signaling-associated mechanism," *Sci. Rep.* 6 (2016) 1–13.
- [246] R. Shalumon, K.T., Anulekha, K.H., Girish, C.M., Prasanth, R., Nair, S.V., Jayakumar, "Single step electrospinning of chitosan/poly(caprolactone) nanofibers using formic acid/acetone solvent mixture," *Carbohydr. Polym.* 80 (2010) 413–419.
- [247] C. Gandhimathi, J.R. Venugopal, A.Y. Tham, S. Ramakrishna, S.D. Kumar, "Biomimetic hybrid nanofibrous substrates for mesenchymal stem cells differentiation into osteogenic cells," *Mater. Sci. Eng. C*. 49 (2015) 776–785.
- [248] L. Nie, D. Chen, Q. Yang, P. Zou, S. Feng, H. Hu, J. Suo, "Hydroxyapatite / poly-L -lactide nanocomposites coating improves the adherence and proliferation of human bone mesenchymal stem cells on porous biphasic calcium phosphate scaffolds," *Mater. Lett.* 92 (2013) 25–28.
- [249] G. Wei, P.X. Ma, "Structure and properties of nano-hydroxyapatite/polymer composite scaffolds for bone tissue engineering.," *Biomaterials*. 25 (2004) 4749–57.
- [250] J. Hossan, M.A. Gafur, M.R. Kadir, M. Mainul, Preparation and Characterization of Gelatin- Hydroxyapatite Composite for Bone Tissue Engineering, (2014).
- [251] H. Jin, D. Kim, T. Kim, K. Shin, J. Sup, H. Park, S. Yoon, "International Journal of Biological Macromolecules In vivo evaluation of porous hydroxyapatite / chitosan – alginate composite scaffolds for bone tissue engineering," *Int. J. Biol. Macromol*

51 (2012) 1079–1085.

- [252] G. Hulsart, A.W. Blom, S. Larsson, A.D. Beswick, "Application of scaffolds for bone regeneration strategies : Current trends and future directions," *Injury*, 44 (2013) S28–S33.

APPENDIX

Publications:

1. Namrata Yadav and Pradeep Srivastava (2019) In vitro studies on gelatin/hydroxyapatite composite modified with osteoblast for bone bioengineering, Heliyon, Volume5, Issue 5, May 2019, e01633.
2. Namrata Yadav and Pradeep Srivastava (2019) Osteoblast studied on gelatin based biomaterials in rabbit bone bioengineering, Material Science and Engineering C. Volume 104,2019,109892,ISSN 0928-4931.
3. Namrata Yadav and Pradeep Srivastava (2021) Study on gelatin/hydroxyapatite/chitosan material modified with osteoblast for bone bioengineering, Arabian Journal for Science and Engineering.
(<https://doi.org/10.1007/s13369-021-05577-9>)