Recent References on the Application of LACTEL® PCL (2012-2017)

L00362 Leong NL, Kabir N, Arshi A, Nazemi A, Jiang J, Wu B et al. Use of Ultra-High Molecular Weight Polycaprolactone Scaffolds for ACL Reconstruction. Journal of Orthopaedic Research 2016; 34:828-835. >>> Poly(e-caprolactone); MW 500 kDa, 80 kDa; Tissue engineering (scaffold);

L00344 Birthare K, Shojaee M, Jones CG, Brenner JR, Bashur CA. Collagen incorporation within electrospun conduits reduces lipid oxidation and impacts conduit mechanics. Biomedical Materials 2016; 11(025019). >>> Poly(e-caprolactone); IV 1.0-1.3 dL/g in chloroform; Tissue engineering (vascular scaffold); rat; electrospinning.

L00322 Baker SR, Banerjee S, Bonin K, Guthold M. Determining the mechanical properties of electrospun poly-epsilon-caprolactone (PCL) nanofibers using AFM and a novel fiber anchoring technique. Materials Science & Engineering C-Materials for Biological Applications 2016; 59:203-212. >>> Poly(e-caprolactone); IV 1.0-1.3 dL/g in chloroform - MW 120-300 kDA; Tissue engineering; electrospinning.

L00314 Ahn H, Ju YM, Takahashi H, Williams DF, Yoo, J.J. et al. Engineered small diameter vascular grafts by combining cell sheet engineering and electrospinning technology. Acta Biomaterialia 2015; 16:14-22. >>> Poly(e-caprolactone); IV 1.77 dL/g; Tissue engineering (vascular graft); electrospinning.

L00337 Kobayashi M, Lei NY, Wang QQ, Wu BM, Dunn JCY. Orthogonally oriented scaffolds with aligned fibers for engineering intestinal smooth muscle. Biomaterials 2015; 61:75-84. >>> Poly(e-caprolactone); Tissue engineering (scaffolds, small intestine); mice (syngeneic wild type adult C57BL/6); 3-6 months; Electrospinning; solution made in hexafluoro-2-propanol; smooth muscle strips seeded into scaffold; "ePCL in vivo degradation studies showed only 20-30% molecular weight reduction after 3-6 months, without structural deterioration" (pg. 82).

L00336 Leong NL, Kabir N, Arshi A, Nazemi A, Wu B, Petrigliano FA et al. Evaluation of Polycaprolactone Scaffold with Basic Fibroblast Growth Factor and Fibroblasts in an Athymic Rat Model for Anterior Cruciate Ligament Reconstruction. Tissue Engineering Part A 2015; 21:1859-1868. >>> Poly(e-caprolactone); IV 1.15 dL/g in chloroform - MW 140 kDa; Tissue engineering (scaffold); rat (male, athymic); electrospinning; collagen coating; "The electrospun polymer scaffold facilitated both cell and matrix alignment in the regenerated ACL. These grafts resulted in successful bony integration with increased strength over time..." (pg. 1864).

L00363 Rowe M, Kamocki K, Pankajakshan D, Li D, Bruzzaniti A, Thomas V et al. Dimensionally stable and bioactive membrane for guided bone regeneration: An in vitro study. J Biomed Mater Res Part B 2015;1-12. >>> Poly(DL-lactide), Poly(e-caprolactone); IV 0.55-0.75 dL/g in chloroform (DL-PL); IV 1.29 dL/g in chloroform (PCL); Tissue engineering (microfibers, orthopedic, in vitro); electrospinning; two-step method used to obtain BBG-containing PLA:PCL membranes.

L00368 Petrigliano FA, Arom G, Nazemi A, Yeranosian M, Wu B, McAllister DR. In vivo evaluatin of electrospun polycaprolactone graft for anterior cruciate ligament engineering. Tissue Engineering Part A 2015; 21(7, 8):1228-1236. >>> Poly(e-caprolactone); MW 110 kDa; Tissue engineering (orthopedic, ACL); Rat (Sprague-Dawley); electrospinning; biocompatibility testing (pg 1231).

L00279 Filipovic N, Stevanovic M, Nunic J, Cundric S, Filipic M, Uskokovic D. Synthesis of poly (ε-caprolactone) nanospheres in the presence of the protective agent poly (glutamic acid) and their cytotoxicity, genotoxicity and ability to induce oxidative stress in HepG2 cells. Colloids and Surfaces B: Biointerfaces 2014; 117:414-424. >>> Poly(ε-caprolactone) ester terminated; IV 0.55-0.75 dL/g; drug delivery (nanospheres); PCL particles synthesized using solvent/non-solvent method.

L00327 Sullins VF, Justin P.Wagner, Arnold T.Suwarnasarn, Steven L.Lee, Benjamin M.Wu, James C.Y.Dunn. A novel biodegradable device for intestinal lengthening. Journal of Pediatric Surgery 2014; 49:109-113. >>> Poly(e-caprolactone); Tissue engineering; Rat (Sprague-Dawley); PCL solutions were spraycoated onto spinning steel to form polymer tubes; PCL spring devices placed into rat jejunum for lengthening.

L00333 Niu G, Sapoznik E, Lu P, Criswell T, Mohs A, Wang G et al. Fluorescent imaging of endothelial cells in bioengineered blood vessels: the impact of crosslinking of the scaffold. Journal of tissue engineering and regenerative medicine 2014. >>> Poly (e-caprolactone); IV 1.7.1.9 dl/g at 30C in chloroform; Tissue engineering (scaffold); electrospinning; see "characterization of scaffolds" (pg. 3) for details on scaffold structure qualities (i.e. microstructure, crosslinking, wettability, etc.).

L00283 Jeon JE, Vaquette C+, Theodoropoulos C, Klein TJ, Hutmacher DW. Multiphasic construct studied in an ectopic osteochondral defect model. Journal of The Royal Society Interface 2014; 11(95):20140184. >>> Poly(e-caprolactone); tissue engineering (orthopedic); rat (SC); electrospinning.

L00309 Yang W, Both SK, van Osch GJVM, Wang Y, Jansen JA, Yang F. Performance of different three-dimensional scaffolds for in vivo endochondral bone generation. European cells & materials 2014; 27:350-364. >>> Poly(e-caprolactone); tissue engineering (scaffold); rat (nude); wet electrospinning method; scaffolds implanted SC.

L00164 Bashur CA, Ramamurthi A. Composition of intraperitoneally implanted electrospun conduits modulates cellular elastic matrix generation. Acta Biomaterialia 2014; 10(1):163-172. >>> Poly(e-caprolactone); IV 1.0-1.3 dL/g; tissue engineering (scaffold); electrospinning.

L00305 Walthers CM, Nazemi AK, Patel SL, Wu BM, Dunn JC. The effect of scaffold macroporosity on angiogenesis and cell survival in tissue-engineered smooth muscle. Biomaterials 2014; 35(19):5129-5137. >>> Poly(e-caprolactone); tissue engineering (scaffold); electrospinning.

L00300 Schulz S, Angarano M, Fabritius M, M++lhaupt R, Dard M, Obrecht M et al. Nonwoven-Based Gelatin/Polycaprolactone Membrane Proves Suitability in a Preclinical Assessment for Treatment of Soft Tissue Defects. Tissue Engineering Part A 2014; 20(13-14):1935-1947. >>> Poly(e-caprolactone); tissue engineering (membrane); minipig; membrane implanted in oral soft tissue defects following dental procedure.

L00173 Whited BM, Rylander MN. The influence of electrospun scaffold topography on endothelial cell morphology, alignment, and adhesion in response to fluid flow. Biotechnology and bioengineering 2014; 111(1):184-195. >>> Poly(e-caprolactone); tissue engineering (scaffold, composite with type I collagen); electrospinning.

L00290 Marszalek JE, Simon CG, Thodeti C, Adapala RK, Murthy A, Karim A. 2.5 D constructs for characterizing phase separated polymer blend surface morphology in tissue engineering scaffolds. Journal of Biomedical Materials Research Part A 2013; 101A(5):1502-1510. >>> Poly(e-caprolactone); Poly(DL-lactide); MW: 80 kDa (PCL), 107.3 kDa (DLPLA); tissue engineering (film, scaffold); Films prepared by spin coating 50:50 blend of two polymers onto

glass substrates or silicon wafers; scaffolds created by pouring polymer solution into Teflon molds filled with NaCl.

L00308 Yang W, Yang F, Wang Y, Both SK, Jansen JA. In vivo bone generation via the endochondral pathway on three-dimensional electrospun fibers. Acta Biomaterialia 2013; 9(1):4505-4512. >>> Poly(e-caprolactone); IV 1.0-1.3 dL/g; tissue engineering (scaffold); rat (nude); wet electrospinning method; scaffolds implanted SC.

L00280 Filipovic N, Stevanovic M, Radulovic A, Pavlovic V, Uskokovic D. Facile synthesis of poly (ε-caprolactone) micro and nanospheres using different types of polyelectrolytes as stabilizers under ambient and elevated temperature. Composites Part B: Engineering 2013; 45(1):1471-1479. >>> Poly(e-caprolactone); drug delivery (microspheres, nanospheres); PCL particles synthesize using solvent/non-solvent method.

L00284 Knight T, Basu J, Rivera EA, Spencer T, Jain D, Payne R. Fabrication of a multi-layer three-dimensional scaffold with controlled porous micro-architecture for application in small intestine tissue engineering. Cell adhesion & migration 2013; 7(3):267-274. >>> Poly(e-caprolactone); Poly(DL-lactide-co-glycolide); MW < 160 kDa (PCL); 32.25 kDa (PLGA); tissue engineering (scaffold); combined compression molding with solvent casting/particulate leaching to develop multi-layered scaffold.

L00153 Gershovich JG, Dahlin RL, Kasper FK, Mikos AG. Enhanced Osteogenesis in Cocultures with Human Mesenchymal Stem Cells and Endothelial Cells on Polymeric Microfiber Scaffolds. Tissue Engineering Part A 2013; 19(23-24):2565-2576. >>> Poly(e-caprolactone); IV 1.0-1.3 dL/g; tissue engineering (scaffold); electrospinning; nonwoven scaffold using 18 wt% PCL with average fiber diameter of 10 micrometer and average thickness of 1.05 +/- 0.05 mm.

L00194 Niu G, Criswell T, Sapoznik E, Lee SJ, Soker S. The influence of cross-linking methods on the mechanical and biocompatible properties of vascular scaffold. Journal of Science and Applications: Biomedicine 2013; 1(1):1-7. >>> Poly(e-caprolactone); IV 1.7-1.9 dL/g in chloroform at 30C; tissue engineering (vascular scaffold); electrospinning; "GN (genipin) cross-linking is a promising method for cross-linking PCL/collagen scaffolds for vascular graft applications".

L00171 Schindler C, Williams BL, Patel HN, Thomas V, Dean DR. Electrospun polycaprolactone/polyglyconate blends: Miscibility, mechanical behavior, and degradation. Polymer 2013; 54(25):6824-6833. >>> Poly(e-caprolactone); IV 1.15 dL/g; tissue engineering (scaffold); 24 months *in vitro*; electrospinning.

L00165 Bashur CA, Eagleton MJ, Ramamurthi A. Impact of Electrospun Conduit Fiber Diameter and Enclosing Pouch Pore Size on Vascular Constructs Grown Within Rat Peritoneal Cavities. Tissue Engineering Part A 2013; 19(7-8):809-823. >>> Poly(e-caprolactone); IV 1.0-1.3 dL/g; tissue engineering (scaffold); rat (Sprague Dawley, 200-250 g, male); electrospinning.

L00166 Yeatts AB, Both SK, Yang W, Alghamdi HS, Yang F, Fisher JP et al. In vivo bone regeneration using tubular perfusion system bioreactor cultured nanofibrous scaffolds. Tissue Engineering Part A 2013; 20(1-2):139-146. >>> Poly(e-caprolactone); IV 1.0-1.3 dL/g; tissue engineering (scaffold); electrospinning; "The electrospinning solution was prepared by dissolving PLGA/PCL (3:1 weight ratio) in trifluoroethanol/HFIP (9:1 volume ratio) at a concentration of 20% w/v".

L00135 Costa PF, Vaquette C+, Zhang Q, Reis RL, Ivanovski S, Hutmacher DW. Advanced Tissue Engineering Scaffold Design for Regeneration of the Complex Hierarchical Periodontal Structure. Journal of clinical periodontology 2013; 41:283-294. >>> Poly(e-caprolactone); tissue engineering (scaffold); rat; electrospinning; scaffolds implanted SC in rats.

L00331 Singh S, Wu B, Dunn JCY. Enhancing angiogenesis alleviates hypoxia and improves engraftment of enteric cells in polycaprolactone scaffolds. Journal of tissue engineering and regenerative medicine 2013; 7(12):925-933. >>> Poly (e-caprolactone); IV 1.00-1.30 dL/g; Tissue engineering (scaffold); scaffolds were prepared by solvent casting and a particulate leaching technique (pg. 926); scaffolds were sterilized in 70% ethanol.

L00137 Dahlin RL, Gershovich JG, Kasper FK, Mikos AG. Flow Perfusion Co-culture of Human Mesenchymal Stem Cells and Endothelial Cells on Biodegradable Polymer Scaffolds. Annals of Biomedical Engineering 2013;1-10. >>> Poly(e-caprolactone); IV 1.0-1.3 dL/g; tissue engineering (scaffold); electrospinning; sterilization by ETO.

L00198 Bhamidipati M, Sridharan BP, Scurto AM, Detamore MS. Subcritical CO2 sintering of microspheres of different polymeric materials to fabricate scaffolds for tissue engineering. Materials Science and Engineering C 2013; 33:4892-4899. >>> Poly(DL-lactide-co-glycolide); poly(e-caprolactone); 50:50; IV 1.3 dL/g - 42-44 kDa; IV 1.1-1.3 dL/g - 110- 125 kDa; tissue engineering (scaffold); < 3 months; < 24 months; "Uniform PLGA and PCL microspheres were lyophilized for 48 h and stored at 20 °C. A 10% polymer solution for PCL and a 20% polymer solution for PLGA were used to prepare the microspheres.".

L00208 Zhao W, Ju YM, Christ G, Atala A, Yoo JJ, Lee SJ. Diaphragmatic muscle reconstruction with an aligned electrospun poly (+¦-caprolactone)/collagen hybrid scaffold. Biomaterials 2013; 34(33):8235-8240. >>> Poly(e-caprolactone); IV 1.77 dL/g in HFP; tissue engineering (scaffold); electrospinning; scaffolds were fabricated by electrospinning a blend of PCL and collagen type I.

L00219 Zhang X, Xu Y, Thomas V, Bellis SL, Vohra YK. Engineering an antiplatelet adhesion layer on an electrospun scaffold using porcine endothelial progenitor cells. Journal of Biomedical Materials Research Part A 2012; 97A(2):145-151. >>> Poly(e-caprolactone); tissue engineering (scaffold); electrospinning; "this electrospun scaffold holds a great promise as a coronary artery substitute to promote the regeneration of functional arterial tissues in vivo." pg 150.

L00214 Samavedi S, Guelcher SA, Goldstein AS, Whittington AR. Response of bone marrow stromal cells to graded co-electrospun scaffolds and its implications for engineering the ligament-bone interface. Biomaterials 2012; 33(2012):7727-7735. >>> Poly(e-caprolactone); IV 1.15 dL/g in TFE; tissue engineering (scaffold, nano-hydroxyapatite); electrospinning.

L00116 Vaquette C, Fan W, Xiao Y, Hamlet S, Hutmacher DW, Ivanovski S. A biphasic scaffold design combined with cell sheet technology for simultaneous regeneration of alveolar bone/periodontal ligament complex. Biomaterials 2012; 33:5560-5573. >>> Poly(ε-caprolactone); tissue engineering (biphasic scaffold, beta-tricalcium phosphate); rat (nude); in vitro; periodontitis; electrospinning.

L00241 Lee J, Yoo JJ, Atala A, Lee SJ. Controlled heparin conjugation on electrospun poly (e-caprolactone)/gelatin fibers for morphology-dependent protein delivery and enhanced cellular affinity. Acta Biomaterialia 2012; 8(7):2549-2558. >>> Poly(e-caprolactone); IV 1.77 dL/g; tissue engineering (scaffold), drug delivery (lysozyme); electrospinning.

L00242 Lee J, Yoo JJ, Atala A, Lee SJ. The effect of controlled release of PDGF-BB from heparin-conjugated electrospun PCL/gelatin scaffolds on cellular bioactivity and infiltration. Biomaterials 2012; 33:6709-6720. >>> Poly(e-caprolactone); IV 1.77 dL/g; tissue engineering (scaffold), drug delivery (platelet-derived growth factor-BB); electrospinning.

L00238 Lee BK, Ju YM, Cho JG, Jackson JD, Lee SJ, Atala A et al. End-to-side neurorrhaphy using an electrospun PCL/collagen nerve conduit for complex peripheral motor nerve regeneration. Biomaterials 2012; 33:9027-9036. >>> Poly(e-caprolactone); IV 1.77 dL/g; tissue engineering (nerve conduit); rat; electrospinning.