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EDUCATION

1991-1994 Technion - Israel Institute of Technology – Biology – B.A.
1997-1999 Tel Aviv University – Sackler Faculty of Medicine – Medical Sciences- M.Sc.
2000-2004 Technion- Israel Institute of Technology – Biotechnology Interdisciplinary Unit – Ph.D.

PROFESSIONAL EXPERIENCE

1994-1996 Professional Officer, Medicine Corp, IDF - Head of Clinical Laboratory.
1996-1997 Head of Plant Tissue Culture Laboratory , Ben Zur Nurseries & Laboratory Ltd.
1999-2000 Research Assistant, *In-Sight* Biotechnology Company Ltd.
2004 Postdoctoral Research Associate, Faculty of Medicine, Technion
2004- 2007 Postdoctoral Fellow, Bioengineering, Massachusetts Institute of Technology
2007- Present Assistant Professor, Chemical and Biomolecular Engineering, JHU
2007- 2010 Member of the Howard Hughes Medical Institute graduate training program, JHU
2007-Present Member of the Institute for NanoBioTechnology (INBT), JHU
2009-Present Project co-I, NCI PS-OC Johns Hopkins Engineering in Oncology Center
2012-Present Secondary Appointment, Materials Science and Engineering, JHU
2013-Present Associate Professor (with tenure), Chemical and Biomolecular Engineering, JHU

AWARDS AND HONORS

1998-1999 Tel Aviv University, Sackler Faculty of Medicine, Graduate School, Merit Award
2001-2003 Technion- Israel Institute of Technology, Graduate School, Merit Award
2004 European Science Foundation, Cellular and Molecular Basis of Regeneration, Euresco Conferences Award
2005-2007 Juvenile Diabetes Research Foundation, Postdoctoral Fellowship Award
2006 Engineering Conferences International, The 10th conference on Cell Culture Engineering, Conference Award
2007 Keystone Symposia Scholarship, Stem Cell Interactions with their Microenvironmental Niche
2008 Maryland Academy of Sciences Outstanding Young Engineer Award, Allan C. Davis Medal
2008-2012 American Heart Association National Scientist Development Award
2009-2011 Basil O'Connor Starter Scholar Research Award, the March of Dimes Foundation
2009 North America Vascular Biology Organization Junior Investigator Award
2011 U.S. New Investigators Travel Award, International Society on Thrombosis & Haemostasis (ISTH), Kyoto, Japan (declined)
2011-2016 NSF CAREER award

PUBLICATIONS

Journal Publications

Peer reviewed- Original Contributions (*denotes equal contribution/co-corresponding)

1. Zemel R, **Gerecht S**, Greif H, Bachmatove L, Birk Y, Golan-Goldehirsh A, Kunin M, Berdichevsky Y, Benhar I and Tur-Kaspa R. Cell transformation induced by hepatitis C virus NS3 serine protease. *J Viral Hepat.* 2001; 8: 96-102.
2. Shapira R, Zemel R, **Gerecht S**, Mor E, Ben-Ari Z, Zahavi I, Dinari G and Tur-Kaspa R. Transfusion-transmitted virus in liver-transplanted children. *Transplant Proc* 2001; 33: 2957-2958.
3. **Gerecht-Nir S**, Ziskind A, Cohen S and Itskovitz-Eldor J. Human embryonic stem cells as an in vitro model for human vascular development and the induction of vascular differentiation. *Lab Invest.* 2003; 83: 1811-1820.
4. **Gerecht-Nir S**, Cohen S and Itskovitz-Eldor J. Bioreactor cultivation enhances the efficiency of human embryoid body (hEB) formation and differentiation. *Biotechnol Bioeng.* 2004; 86: 493-502.
5. Suss-Toby E, **Gerecht-Nir S**, Amit M, Manor D and Itskovitz-Eldor J. Derivation of a diploid human embryonic stem cell line from a mononuclear zygote. *Hum. Reprod.* 2004; 19: 670-675. [4.357]
6. Dang S, **Gerecht-Nir S**, Chen J, Itskovitz-Eldor J and Zandstra PW. Controlled scalable embryonic stem cell differentiation culture. *Stem Cells.* 2004; 22:275-282.
7. Ginis I, Luo Y, Miura T, Thies S, Brandenberger R, **Gerecht-Nir S**, Amit M, Hoke A, Carpenter M, Itskovitz-Eldor J and Rao MS. Differences between human and mouse embryonic stem cells. *Dev. Biol.* 2004; 269:360-380.
8. **Gerecht-Nir S**, Cohen S, Ziskind A and Itskovitz-Eldor J. 3-D porous alginate scaffolds provide a conducive environment for the generation of well vascularized embryoid bodies from human embryonic stem cells. *Biotechnol Bioeng.* 2004; 88:313-320. [3.7]
9. **Gerecht-Nir S**, Osenberg S, Nevo O, Ziskind A, Coleman R and Itskovitz-Eldor J. Vascular development in early human embryos and in teratoma derived from human embryonic stem cells. *Biol Reprod* 2004; 71: 2029-2036. [3.87]
10. Golan-Mashiach M, Dazard J-E, **Gerecht-Nir S**, Amariglio N, Fisher T, Jacob-Hirsch J, Bielora B, Osenberg S, Barad O, Getz G, Toren A, Rechavi G, Eldor-Itskovitz J, Domany E and Givol D. Design principle of gene expression used by human stem cells; implication for pluripotency. *FASEB J* 2005; 19: 147-149.
11. **Gerecht-Nir S**, Dazard J-E, Golan-Mashiach M, Osenberg S, Botvinnik A, Amariglio N, Domany E, Rechavi G, Givol D and Itskovitz-Eldor J. Vascular gene expression and phenotypic correlation during differentiation of human embryonic stem cells. *Dev Dyn* 2005; 232:488-498.
12. Segev H, Kenyagin-Karsenti D, Fishman B, **Gerecht-Nir S**, Ziskind A, Amit M, and Itskovitz-Eldor J. Molecular analysis of cardiomyocytes derived from human embryonic stem cells. *Dev. Growth Diff.* 2005; 47:295-306.
13. Dolnikov K, Shilkrot M, Zeevi-Levin N, Danon D, **Gerecht-Nir S**, Itskovitz-Eldor J, Binah O. Functional properties of human embryonic stem cell-derived cardiomyocytes. *Ann N Y Acad Sci.* 2005; 1047: 66-75.
14. Dolnikov K, Shilkrot M, Zeevi-Levin N, **Gerecht-Nir S**, Amit M, Danon A, Itskovitz-Eldor J, Binah O. Functional properties of human embryonic stem cells-derived cardiomyocytes: Intracellular Ca_2^+ handling and the role of sarcoplasmic reticulum in the contraction. *Stem Cells.* 2006; 24:236-245.
15. Leor J, **Gerecht S**, Cohen S, Miller L, Holbova R, Ziskind A, Shachar M, Feinberg M.S, Guetta E, Itskovitz-Eldor J. Human embryonic stem cells are not guided to form new myocardium by transplantation into normal or infarcted heart of athymic nude rat. *Heart.* 2007; 93:1278-1284. Editorial by Janssens S, *Heart.* 2007; 93:1173-1174.
16. Ferreira L, **Gerecht S**, Fuller J, Shieh HF, Vunjak-Novakovic G, Langer R. Bioactive hydrogel scaffolds for controllable vascular differentiation of human embryonic stem cells. *Biomaterials.*

2007; 28:2706-2717.

17. **Gerecht S***, Figallo E*, Cannizzaro C*, Burdick JA, Langer R, Elvassor N, Vunjak-Novakovic G. Microbioreactor arrays for controlling cellular microenvironments. *Lab Chip*. Special issue on Cell and Tissue Engineering in Microsystems. 2007; 7: 710 – 719
18. **Gerecht S**, Burdick JA, Ferreira LS, Townsend SA, Langer R, and Vunjak-Novakovic G. Hyaluronic acid hydrogel for controlled self-renewal and differentiation of human embryonic stem cells. *Proc Natl Acad Sci U S A*. 2007; 104:11298-11303.
19. Ferreira L, **Gerecht S**, Shieh H, Watson, N, Rupnick, M.A. Dallabrida, S.M Vunjak-Novakovic G, Langer R. Vascular progenitor cells isolated from human embryonic stem cells give rise to endothelial and smooth muscle-like cells and form vascular network *in vivo*. *Circ. Res*. 2007;101:286-294.
20. **Gerecht S***, Bettinger* CJ, Zhang Z, Borenstein J, Vunjak-Novakovic G, Langer R. The effect of actin disrupting agents on contact guidance of human embryonic stem cells. *Biomaterials*. 2007; 28:4068-4077.
21. **Gerecht S**, Townsend SA, Pressler H, Zhu H, Nijst C.L.E, Broggeman J, Nichol J, Langer R. A porous photocurable bioelastomer for cell encapsulation and culture. *Biomaterials*. 2007; 28:4826-4835.
22. Bettinger CJ, Zhang Z, **Gerecht S**, Borenstein J, Langer R. Enhancement of in vitro capillary tube formation by substrate nanotopography. *Adv. Mater*. 2008; 20: 99–103.
23. Mei Y, **Gerecht S**, Taylor M, Urquhart AJ, Bogatyrev SR, Cho S-W, Davies MC, Alexander MR, Langer R, Anderson DG. Mapping the Interactions among Biomaterials, Adsorbed Proteins and Human Embryonic Stem Cells. *Adv. Mater*. 2009; 21: 2781-2786.
24. Serena E, Figallo E, Tandon N, Cannizzaro C, **Gerecht S**, Elvassore N, Vunjak-Novakovic G. Electrical stimulation of human embryonic stem cells: cardiac differentiation and the generation of reactive oxygen species. *Exp Cell Res*. 2009; 315:3611-3619.
25. Sun G, Shen Y-I, Ho C-C, Kusuma S, **Gerecht S**. Functional Groups Affect Physical and Biological Properties of Dextran-Based Hydrogels *J Biomed Mater Res A*. 2010; 93:1080-1090. PMID: 19753626
26. Hanjaya-Putra D, Yee J, Ceci D, Truitt R, Yee D, **Gerecht S**. Vascular endothelial growth factor and substrate mechanics regulate *in vitro* tubulogenesis of endothelial progenitor cells. *J Cell Mol Med*. 2010; 14:2436-2447. PMID: 19951684
27. Abaci EH*, Truitt R*, Luong E, Drazer G, **Gerecht S**. Adaptation of oxygen consumption in cultures of human pluripotent stem cells, endothelial progenitor cells and umbilical vein endothelial cells. *Am J Physiol Cell Physiol*. 2010; 298:C1527-C1537. PMID: 20181925
28. Vo E*, Hanjaya-Putra D*, Zha Y, **Gerecht S**. Smooth-muscle-like cells derived from human embryonic stem cells support and augment cord-like structures *in vitro*. *Stem Cell Rev*. 2010; 6:237-247. PMID: 20425149
29. Dickinson LE, Ho CC, Wang G, Stebe K, **Gerecht S**. Functional surfaces for high-resolution analysis of cancer cell interactions on exogenous hyaluronic acid. *Biomaterials*. 2010; 31:5472-5478. PMID: 20398926
30. Daniels BR, Hale CM, Khatau SB, Kusuma S, Dobrowsky TM, **Gerecht S**, Wirtz D. Differences in the microrheology of human embryonic stem (hES) cells and human induced pluripotent stem (hiPS) cells. *Biophys J* 2010;99:3563-3570.
31. Dickinson LE, Moura ME, **Gerecht S**. Guiding endothelial progenitor cell tube formation by patterned fibronectin surfaces. *Soft Matter*. Special issue on Tissue Engineering. 2010; 6:5109 – 5119. Cover.
32. Sun G, Shen Y-I, Kusuma S, Fox-Talbot K, Steenbergen C, **Gerecht S**. Functional neovascularization of biodegradable dextran hydrogels with multiple angiogenic growth factors. *Biomaterials*. 2011;32:95-106. PMID: 20870284
33. Dickinson LE, **Gerecht S**. Micropatterned surfaces to study hyaluronic acid Interactions with cancer cells. *J Vis Exp*. 2010;46. pii: 2413. PMID: 21206473
34. Yee D*, Hanjaya-Putra D*, Bose V, Luong E, **Gerecht S**. Hyaluronic acid hydrogels support cord-

- like structures from endothelial colony-forming cells. *Tissue Engineering Part A*. 2011; 17:1351-1361. PMID: 21247340
35. Khatau SB, Kusuma S, Hanjaya-Putra D, Mali P, Cheng L, **Gerecht S**, Wirtz D. The differential formation of the lamin A/C-mediated perinuclear actin cap in pluripotent and somatic cells. *PLoS ONE*. In press.
 36. Hanjaya-Putra D, Bose V, Shen Y-I, Yee J, Khetan S, Fox-Talbot K, Steenbergen C, Burdick JA, **Gerecht S**. Controlled activation of morphogenesis to generate a functional human microvasculature in a synthetic matrix. *Blood*. 2011;118:804-815. PMID: 21527523; Commentary in the same issue: Geissler EK, Angele P. Innovative blood vessels bring new life. *Blood*. 2011;118:488-90.
 37. Abaci EH, Truitt T, Tan S, **Gerecht S**. Unforeseen decreases in dissolved oxygen levels affect tube formation kinetics in collagen gels. *Am J Physiol Cell Physiol*. 2011;301:C431-440. Epub 2011 May 4. PMID: 21543738
 38. Sun G, Kusuma S, **Gerecht S**. Development of a biodegradable, temperature-sensitive dextran-based polymer as a cell-detaching substrate. *Macromol. Biosci*. 2012 12:21-28. PMID: 22083795
 39. Abaci EH, Devendra R, Smith Q, **Gerecht S***, Drazer G* Design and development of microbioreactors for long-term cell culture in controlled oxygen Microenvironments. *Biomed Microdevices*. 2012, 14:145-152. PMID: 21947550.
 40. Sun G, Zhang X, Shen Y-I, Sebastian R, Dickinson LE, Fox-Talbot K, Reinblatt M, Steenbergen C, Harmon J, **Gerecht S**. Dextran hydrogel scaffolds enhance angiogenic response and promote complete skin regeneration during burn wound healing. *Proc Natl Acad Sci U S A*. 2011; 108:20976-20981. PMID: 22171002
 41. Dickinson LE, Rand DR, Tsao J, Eberle W, **Gerecht S**. Endothelial cell responses to micropillar substrates of varying dimensions and stiffness. *J Biomed Mater Res A*. 2012; 100:1457-1466. PMID: 22389314
 42. Abaci EH, Devendra R, Soman R, Drazer G*, **Gerecht S***. Microbioreactors to manipulate oxygen tension and shear stress in the microenvironment of vascular stem and progenitor cells. *Biotechnol Appl Biochem*. Special Issues on Stem Cells. 2012; 59:97-105.
 43. Hielscher AC, Qiu C, **Gerecht S**. Breast cancer cell-derived matrix supports vascular morphogenesis. *Am J Physiol Cell Physiol*. 2012; 302:C1243-C1256.
 44. Hanjaya-Putra D, Wong K, Hirotsu K, Khetan S, Burdick JA, **Gerecht S**. Spatial control of cell-mediated degradation to regulate vasculogenesis and angiogenesis in hyaluronan hydrogel. *Biomaterials*. 2012; 33:6123-6131 PMID: 22672833
 45. Kusuma S, Zhao S, **Gerecht S**. The extracellular matrix is a novel attribute of endothelial progenitors and of hypoxic mature endothelial cells. *FASEB J*. 2012; 26:4925-4936. PMID: 22919069
 46. Dickinson LE, Lutegebaucks C, Lewis D, **Gerecht S**. Patterning microscale extracellular matrices to study endothelial and cancer cell interactions *in vitro*. *Lab Chip*. 2012; 12:4244-4248. PMID: 22992844
 47. Wanjare M, Kuo F, **Gerecht S**. Derivation and maturation of synthetic and contractile smooth muscle cells from human pluripotent stem cells. *Cardiovas Res*. 2013; 1:321-330. PMID: 23060134
 48. Hanjaya-Putra D, Shen Yu-I, Wilson A, Fox-Talbot K, Khetan S, Burdick JA, Steenbergen C, **Gerecht S**. Integration and regression of implanted engineered human vascular networks during deep wound healing. *Stem Cells Transl Med*. 2013; 2:297-306. PMID: 23486832
 49. The Physical Sciences – Oncology Network*. A physical sciences network characterization of nonmalignant and metastatic cells. *Scientific Reports*. 2013; 3:1449. PMID: 23618955 (*denotes a group of investigator of the NCI-PSOC network who authored this article)
 50. Hielscher AC, Qiu C, Porterfield J, Smith Q, **Gerecht S**. Hypoxia affects the structure of breast cancer cell-derived matrix to support angiogenic responses of endothelial cells. *Carcinogenesis & Mutagenesis*. 2013; S13: 005.
 51. Kusuma S, Shen Y-I, Hanjaya-Putra D, Mali P, Cheng L, **Gerecht S**. Self-Organized Vascular

Networks from Human Pluripotent Stem Cells in a Synthetic Matrix. *Proc Natl Acad Sci U S A*. 2013; 110:12601-12606

52. Wang Y, Chou BK, Dowe S, **Gerecht S***, Cheng L*. Scalable expansion of human induced pluripotent stem cells in chemically defined xeno-free suspension culture system. *Stem Cell Research*. *Stem Cell Res*. 2013; 11: 1103-1116.
53. Zhang S, Liu X, Barreto-Ortiz FS, Yu Y, Ginn B, DeSantis N, Hutton LD, Grayson W, Cui F-Z, Korgel AB, **Gerecht S**, Mao H-Q. Creating Polymer Hydrogel Microfibers with Internal Alignment via Electrical and Mechanical Stretching. In revision.
54. Barreto-Ortiz SF, Zhang S, Davenport M, Fradkin J, Ginn B, Mao H-Q, **Gerecht S**. A Novel *In Vitro* Model for Microvasculature Reveals Regulation of Circumferential ECM Organization by Curvature. *PLoS ONE* 2013; 8:e81061.

Peer reviewed- Reviews

55. **Gerecht-Nir S**, David R, Zabura M, Franz WM and Itskovitz-Eldor J. Human Embryonic Stem Cells for Cardiovascular Repair. *Cardiovasc Res*. 2003;58: 313-323.
56. **Gerecht-Nir S**, Eldor L and Itskovitz-Eldor J. Advances in Human Stem Cell Research. *Clin Obstet Gynecol*. 2003; 46:218-230.
57. **Gerecht-Nir S**, Fishman B and Itskovitz-Eldor J. Cardiovascular Potential of Embryonic Stem Cells. *Anat Rec. Part A*. 2004; 276A:58-65.
58. **Gerecht-Nir S** and Itskovitz-Eldor J. Human Embryonic Stem Cells: a Potential Source for Cellular Therapy. *Am J Transplant*. 2004; 4 (Suppl. 6):51-57.
59. **Gerecht-Nir S** and Itskovitz-Eldor J. Cell Therapy using Human Embryonic Stem Cells. *Immuno. Transplant*. 2004;12:203-209.
60. **Gerecht-Nir S** and Itskovitz-Eldor J. The Promise of Human Embryonic Stem Cells. *Best Pract Res Clin Obstet Gynaecol*. 2004; 18:843-852.
61. **Gerecht-Nir S**, Radisic M, Park H, Cannizzaro C, Boublik J, Langer R and Vunjak-Novakovic G. Biophysical Regulation During Cardiac Development and Application to Tissue Engineering. *Int J Dev Biol*. 2006;50: 233-243.
62. Radisic M, Park H, **Gerecht S**, Cannizzaro C, Freed L, Langer R, and Vunjak-Novakovic G. Biomimetic Approach to Cardiac Tissue Engineering. *Philos Trans R Soc Lond B Biol Sci*. 2007, 362: 1357-1368.
63. Cannizzaro C, Tandon N, Figallo E, Park H, **Gerecht S**, Radisic M, Elvassore N, and Vunjak-Novakovic G. Practical Aspects of Cardiac Tissue Engineering with Electrical Stimulation. *Methods Mol Med*. 2007, 140:291-307.
64. Godier AFG, Marolt D, **Gerecht S**, Tajnsek U, Mertens TP, and Vunjak-Novakovic G. Engineered Microenvironments for Human Stem Cells. *Birth Defects Research, Part C: Embryo Today* 2008;84: 335-347.
65. Hanjaya Putra D and **Gerecht S**. Vascular Engineering Using Human Embryonic Stem Cells. *Biotechnol Prog*. 2009; 25:2-9. PMID: 19197982
66. Sun G and **Gerecht S**. Vascular Regeneration: Engineering Stem Cell Microenvironment. *Regen Med*. 2009; 4:435-447.
67. Kusuma S and **Gerecht S**. Engineering blood vessels using stem cells: innovative approaches to treat vascular disorders. *Expert Rev Cardiovasc Ther* 2010; 8:1433-1445. PMID: 20936930
68. Dickinson LE*, Kusuma S*, **Gerecht S**. Reconstructing the differentiation niche of embryonic stem cells using biomaterials. *Macromol. Biosci*. 2011;1:36-49. Cover. PMID: 20967797
69. Hielscher AC, **Gerecht S**. Engineering approaches for investigating tumor angiogenesis: exploiting the role of the extracellular matrix. *Cancer Res*. 2012; 72: 1-8. PMID: 23172313
70. Serbo J, **Gerecht S**. Vascular tissue engineering: biodegradable scaffold platforms to promote angiogenesis. *Stem Cell Res Ther*. 2013; 4:8. "Article is designated as 'Highly accessed'".
71. Wanjare M, Kusuma S, **Gerecht S**. Perivascular cells in blood vessel regeneration. *Biotechnology J*. 2013; 8:434-447. PMID: 23554249.

72. Abaci EH, Drazer G*, **Gerecht S***. Recapitulating the Vascular Microenvironment in Microfluidic Platforms. *Nano LIFE*. 2013; 3:1340001.
73. Smulovitz C, Dickinson LE, **Gerecht S**. Micropatterned Surfaces for the Study of Cancer and Endothelial Cell Interactions with Hyaluronic Acid. Special Issue: New Biomaterials (Wolf Prize for R. Langer). *Isr J Chem*. 2013; 53: 710-718.
74. Wang Y, Cheng L*, **Gerecht S***. Efficient and scalable expansion of human pluripotent stem cells under clinically compliant settings: a view in 2013. *Ann Biomed Eng*. Special Issue: Tissue Engineering and Regenerative Medicine. In press.
75. Smith Q, **Gerecht S***. Going with the flow: microfluidic platforms in vascular tissue engineering. Special Issue: Biological Engineering. *Curr Opin Chem Eng*. 2014. In press.
76. Song HH, Park K, **Gerecht S**. Current Strategies in Engineering Vasculature and Application for 3D Tumor Angiogenesis Modeling. Themed Issue: Engineering of Tumor Microenvironments. *Adv Drug Deliv Rev*. submitted.

Reviews, Editorial & Views

1. Shen Y-I and **Gerecht S**. Stem Cells and Materials for Vascular Differentiation and Regeneration. *BIOforum Europe*. 2008; 12: 11-13.
2. Kusuma S and **Gerecht S**. Research Highlights. *Regen Med*. 2009; 4:805-807. [3.358]
3. Hanjaya Putra D and **Gerecht S**. Preview: Mending the Failing Heart with a Vascularized Cardiac Patch. *Cell Stem Cell*. 2009. 5:575-576. PMID: 19951684
4. Barreto-Ortiz SF and **Gerecht S**. Research Highlights. *Regen Med*. 2011; 6: 551-554. PMID: 21916590
5. Kusuma S and **Gerecht S**. Recent progress in the use of induced pluripotent stem cells in vascular regeneration. *Expert Rev Cardiovasc Ther* 2013; 11:661-663.
6. Kusuma S and **Gerecht S**. The fast and the furious: The mass and motion of stem cells. New and Notable. *Biophys J*. 2013; 105; 837-838.

Book

Biophysical Regulation of Vascular Differentiation and Assembly, **Gerecht S** (Ed), Springer Academic Publisher, 2011.

Book Chapters

1. **Gerecht-Nir S** and Itskovitz-Eldor J. Vascular Lineage Differentiation from Human Embryonic Stem Cells. In: Human Embryonic Stem Cells. Chiu A and Rao M.S (Eds), Humana Press, Totowa, New Jersey, 2003.
2. **Gerecht-Nir S** and Itskovitz-Eldor J. Vascular Progenitor Cells in the Human Model. Lanza R, Melton D, Thomson J, Gearhart J, Hogan B, McKay R, Pedersen R and West M (Eds). Handbook of embryonic stem cells. San Diego, Calif.: Academic Press, 2004.
3. **Gerecht-Nir S** and Itskovitz-Eldor J. Differentiation of Human Embryonic Stem Cells. In: Embryonic stem cells- A practical approach. Notarianni E and Evans M (Eds), Oxford university press. 2006.
4. Amit M, **Gerecht-Nir S**, and Itskovitz-Eldor J. Derivation, Subcloning, Spontaneous and Controlled Differentiation of Human Embryonic Stem Cells. In: Stem Cells- From Bench to Beside. Bongso A and Lee E.H (Eds), World Scientific Publishing Co. 2005.
5. **Gerecht S**, Burdick JA, Cannizzaro C, and Vunjak-Novakovic G. 3D cultivation of human embryonic stem cells. In: Human Embryonic Stem Cells. Masters J, Palsson B, and Thomson J (Eds), Human Cell Culture Series, Springer Verlag. 2007.
6. Khademhosseini A*, Karp JM*, **Gerecht S***, Ferreira L*, Vunjak-Novakovic G, Langer R. Embryonic Stem Cells as a Cell Source for Tissue Engineering in: Principles of Tissue Engineering, Lanza, Langer and Vacanti (Eds), Elsevier/Academic Press. 2007.
7. Cannizzaro C, Tandon N, Figallo E, Park H, **Gerecht S**, Radisic M, Elvassore N, Vunjak-Novakovic G. Practical aspects of cardiac tissue engineering with electrical stimulation. In: Methods in

Molecular Medicine, Tissue Engineering, Hauser and Fussenegger (Eds), Humana Press, 2007.

8. **Gerecht S***, Ferreira L*, Langer R. Vascular differentiation of human embryonic stem cells in bioactive hydrogel-based scaffolds in: Human Embryonic Stem Cells: Methods and Protocols, Turksen and Walker (Eds), Humana Press, 2010.
9. Luong E, **Gerecht S**. Stem cells and scaffolds for vascularizing engineered tissue constructs in: Advances in Biochemical Engineering/Biotechnology - Stem Cells, Martin (Ed), Springer Academic Publisher, 2009. PMID: 19082932
10. Dickinson LE, **Gerecht S**. Stem cells for vascular regeneration: an engineering approach in: Stem Cell and Tissue Engineering, Song L and Elisseeff J (Eds), World Scientific Publishing Co. (2011).
11. Sun G*, Kusuma S*, and **Gerecht S**. The integrated role of stem cells and biomaterials in vascular regeneration in: Biomaterials as stem cell niche, Roy K (Ed), as part of the series: Studies in Mechanobiology, Tissue Engineering and Biomaterials" (Series Editor: Prof. Gefen A), Springer Academic Publisher (2010).
12. Hanjaya Putra D, Wangare M, and **Gerecht S**. Vascular Tissue Engineering in: Biomaterials for Tissue Engineering: A Review of the Past and Future Trends. Burdick and Mauck (Eds), Springer Academic Publisher, 2011.
13. Abaci EH, Hanjaya-Putra D, **Gerecht S**. Hypoxia and matrix manipulation for vascular engineering in: Biophysical Regulation of Vascular Differentiation and Assembly, **Gerecht S** (Ed), Springer Academic Publisher, 2011
14. Cuddy AC, Yu-I Shen, and **Gerecht S**. Engineering bioactive scaffolds for stem cell vascular therapy in: Stem Cells – From Mechanisms to Technologies. Stachowiak and Tzanakakis (Eds), World Scientific Publishing and Imperial College Press (2012).
15. **Gerecht S**. Mimicking the microenvironment. *WTEC Panel Report on Assessment of Physical Sciences and Engineering Advances in Life Sciences and Oncology* (APHELION). Humana Press (2012).
16. Kusuma S, Dickinson L, **Gerecht S**. Cell-material interactions for blood vessel formation in: Cardiac regeneration and repair: Biomaterials and tissue engineering Volume II, Li and Weisel (Eds), Woodhead Publishing (2013).
17. Park K-M and **Gerecht S**. reconstruction of the differentiation niche of embryonic stem cells using biomaterials to direct stem cell fate. Cell and Molecular Biology and Imaging of Stem Cells, Schatten (Ed), John Wiley & Sons, Inc. (accepted; 2013).
18. Barreto-Ortiz SF, Smith Q, **Gerecht S**. Vascular development and morphogenesis in biomaterials. Vascularization: Regenerative Medicine and Tissue Engineering. CRC Press. (2013).
19. Kusuma S, Macklin B, **Gerecht S**. Derivation and Network Formation of Vascular Cells from Human Pluripotent Stem Cells. Biomimetics and Stem Cells, Methods and Protocols, Kursan and Vunjak-Novakovic (Eds) Springer Protocols. (2013).