



BIBLIOGRAPHY OF RESEARCH PUBLICATIONS

Last Updated January 31, 2017

Table of Contents

Newest Releases.....	2
General Review Articles.....	8
Bone.....	9
Cancer.....	12
Cardiovascular.....	15
Cartilage/Chondrocytes.....	18
Fluid Mechanical Principles of the RCCS.....	19
Hematopoietic System.....	19
Insect.....	20
Liver/Pancreas.....	21
Microbiology.....	27
Neural/Neuroendocrine.....	31
Prostate.....	33
Renal.....	33
Reproductive.....	33
Salivary Gland.....	34
Signaling.....	34
Skeletal Muscle.....	34
Skin.....	34
Spaceflight.....	36
Stem Cells.....	41
Tissue Engineering.....	46
Toxicology.....	53
Viral.....	53
Yeast.....	54

NEWEST RELEASES

Human three-dimensional endometrial epithelial cell model to study host interactions with vaginal bacteria and *Neisseria gonorrhoeae*.

Laniewski P, Gomez A, Hire G, So M, Herbst-Kralovetz MM. *Infect Immun*. 2017 Jan 4. pii: IAI.01049-16. doi: 10.1128/IAI.01049-16.

Effect of Rotation on Scaffold Motion and Cell Growth in Rotating Bioreactors.

Varley MC, Markaki AE, Brooks RA. *Tissue Eng Part A*. 2017 Jan 26. doi: 10.1089/ten.TEA.2016.0357.

Three-dimensional simulated microgravity culture improves the proliferation and odontogenic differentiation of dental pulp stem cell in PLGA scaffolds implanted in mice.

Li Y, He L, Pan S, Zhang L, Zhang W, Yi H, Niu Y. *Mol Med Rep*. 2017 Feb;15(2):873-878. doi: 10.3892/mmr.2016.6042.

Generating mechanically stable, pediatric, and scaffold-free nasal cartilage constructs in vitro

Akbari P, Waldman SD, Propst E, Cushing SL, Weber JF, Yeger H, Farhat WA. *Tissue Eng Part C Methods*. 2016 Nov 9.

Three-Dimensional Rotating Wall Vessel-Derived Cell Culture Models for Studying Virus-Host Interactions.

Gardner JK, Herbst-Kralovetz MM. *Viruses*. 2016 Nov 9;8(11). pii: E304.

Engineering three dimensional micro nerve tissue using postnatal stem cells from human dental apical papilla.

Kim BC, Jun SM, Kim SY, Kwon YD, Choe SC, Kim EC, Lee JH, Kim J, Suh JF, Hwang YS. *Biotechnol Bioeng*. 2016 Oct 24. doi: 10.1002/bit.26205.

Scaffold-free Tissue Formation Under Real and Simulated Microgravity Conditions.

Aleshcheva G, Bauer J, Hemmersbach R, Slumstrup L, Wehland M, Infanger M, Grimm D. *Basic Clin Pharmacol Toxicol*. 2016 Oct;119 Suppl 3:26-33. doi: 10.1111/bcpt.12561.

Microgravity induces proteomics changes involved in endoplasmic reticulum stress and mitochondrial protection.

Feger BJ, Thompson JW, Dubois LG, Kommaddi RP, Foster MW, Mishra R, Shenoy SK, Shibata Y, Kidane YH, Moseley MA, Carnell LS, Bowles DE. *Sci Rep*. 2016 Sep 27;6:34091. doi: 10.1038/srep34091.

Microgravity as a biological tool to examine host-pathogen interactions and to guide development of therapeutics and preventatives that target pathogenic bacteria.

Higginson EE, Galen JE, Levine MM, Tennant SM. *Pathog Dis*. 2016 Sep 13. pii: ftw095.

Development of a Three-Dimensional Bioengineering Technology to Generate Lung Tissue for Personalized Disease Modeling.

Wilkinson DC, Alva-Ornelas JA, Sucre JM, Vijayaraj P, Durra A, Richardson W, Jonas SJ, Paul MK, Karumbayaram S, Dunn B, Gomperts BN. *Stem Cells Transl Med*. 2016 Sep 15. pii: sctm.2016-0192.

Transfection of the IHH gene into rabbit BMSCs in a simulated microgravity environment promotes chondrogenic differentiation and inhibits cartilage aging.

Liu PC, Liu K1, Liu JF, Xia K, Chen LY, Wu X. *Oncotarget*. 2016 Sep 6;7(39):62873-62885. doi: 10.18632/oncotarget.11871.

Effect of Shear Stress on *Pseudomonas aeruginosa* Isolated from the Cystic Fibrosis Lung.

Dingemans J, Monsieurs P, Yu SH, Crabbé A, Förstner KU, Malfroot A, Cornelis P, Van Houdt R. *MBio*. 2016 Aug 2;7(4). pii: e00813-16. doi: 10.1128/mBio.00813-16.

Effects of simulated microgravity on human brain nervous tissue.

Wang X, Du J, Wang D, Zeng F, Wei Y, Wang F, Feng C, Li N, Dai R, Deng Y, Quan Z, Qing H. *Neurosci Lett*. 2016 Aug 3;627:199-204. doi: 10.1016/j.neulet.2016.06.004. *Neurosci Lett*. 2016 Aug 3;627:199-204.

Paclitaxel-releasing mesenchymal stromal cells inhibit the growth of multiple myeloma cells in a dynamic 3D culture system.

Bonomi A, Steimberg N, Benetti A, Berenzi A, Alessandri G, Pascucci L, Boniotti J, Coccè V, Sordi V, Pessina A, Mazzoleni G. *Hematol Oncol*. 2016 Jun 10. doi: 10.1002/hon.2306.

Physiological fluid shear alters the virulence potential of invasive multidrug-resistant non-typhoidal *Salmonella* Typhimurium D23580

Jiseon Yang, Jennifer Barrila, Kenneth L Roland, C Mark Ott and Cheryl A Nickerson. *npj Microgravity* 2, Article number: 16021 (2016) doi:10.1038/npjmgrav.2016.21

The International Space Station: an Extreme Environment for Key Host-Microbe Discoveries

C. Mark Ott, Thomas Marshburn, and Cheryl A. Nickerson. *Microbe—Volume 11, Number 6, 2016, Pages 253-261.*

IL-36 γ Augments Host Defense and Immune Responses in Human Female Reproductive Tract Epithelial Cells

Sean M. Winkle, Andrea L. Throop and Melissa M. Herbst-Kralovetz. *Front. Microbiol.*, 17 June 2016
<http://dx.doi.org/10.3389/fmicb.2016.00955>

Increased biofilm formation ability in *Klebsiella pneumoniae* after short-term exposure to a simulated microgravity environment.

Wang H, Yan Y, Rong D, Wang J, Wang H, Liu Z, Wang J, Yang R, Han Y. *Microbiologyopen*. 2016 May 16. doi: 10.1002/mbo3.370.

Microgravity Induction of TRAIL Expression in Preosteoclast Cells Enhances Osteoclast Differentiation.

Sambandam Y, Baird KL, Stroebel M, Kowal E, Balasubramanian S, Reddy SV. *Sci Rep*. 2016 May 4;6:25143. doi: 10.1038/srep25143.

Uniform Embryoid Body Production and Enhanced Mesendoderm Differentiation with Murine Embryonic Stem Cells in a Rotary Suspension Bioreactor.

Lei X, Deng Z, Duan E. *Methods Mol Biol*. 2016 Apr 27.

Novel Bioreactor Platform for Scalable Cardiomyogenic Differentiation from Pluripotent Stem Cell-Derived Embryoid Bodies.

Rungarunlert S, Ferreira JN, Dinnyes A. *Methods Mol Biol*. 2016 Apr 5.

Establishment of a 3D-dynamic osteoblasts-osteoclasts co-culture model to simulate the jawbone microenvironment in vitro.

Penolazzi L, Lolli A, Sardelli L, Angelozzi M, Lambertini E, Trombelli L, Ciarpella F, RenataVecchiatini, Piva R. *Life Sci*. 2016 Mar 22. pii: S0024-3205(16)30151-5. doi: 10.1016/j.lfs.2016.03.035.

Decellularized Extracellular Matrix Microparticles as a Vehicle for Cellular Delivery in a Model of Anastomosis Healing.

Hoganson DM, Owens GE, Meppelink AM, Bassett EK, Bowley CM, Hinkel CJ, Finkelstein EB, Goldman SM, Vacanti JP. *J Biomed Mater Res A*. 2016 Mar 4. doi: 10.1002/jbm.a.35703.

Simulated Microgravity Using a Rotary Culture System Compromises the In Vitro Development of Mouse Preantral Follicles.

Zhang S, Zheng D, Wu Y, Lin W, Chen Z, Meng L, Liu J, Zhou Y1. *PLoS One*. 2016 Mar 10;11(3):e0151062. doi: 10.1371/journal.pone.0151062. eCollection 2016.

A three-dimensional culture system recapitulates placental syncytiotrophoblast development and microbial

resistance.

McConkey CA1, Delorme-Axford E, Nickerson CA, Kim KS, Sadovsky Y, Boyle JP, Coyne CB. *Sci Adv.* 2016 Mar 4;2(3):e1501462. doi: 10.1126/sciadv.1501462. eCollection 2016.

Influence of Low-Shear Modeled Microgravity on Heat Resistance, Membrane Fatty Acid Composition, and Heat Stress-Related Gene Expression in Escherichia coli O157:H7 ATCC 35150, 43889, 43890, and 43895.

Kim HW, Rhee MS. *Appl Environ Microbiol.* 2016 Mar 4. pii: AEM.00050-16. *Appl Environ Microbiol.* 2016 Mar 4. pii: AEM.00050-16.

Acceleration of diabetic wound healing by a cryopreserved living dermal substitute created by micronized amnion seeded with fibroblasts.

Zheng Y, Ji S, Wu H, Tian S, Wang X, Luo P, Fang H, Wang Z, Wang J, Wang Z, Xiao S, Xia Z. *Am J Transl Res.* 2015 Dec 15;7(12):2683-93. eCollection 2015.

A Study of Alterations in DNA Epigenetic Modifications (5mC and 5hmC) and Gene Expression Influenced by Simulated Microgravity in Human Lymphoblastoid Cells.

Chowdhury B, Seetharam A, Wang Z, Liu Y, Lossie AC, Thimmapuram J, Irudayaraj J. *PLoS One.* 2016 Jan 28;11(1):e0147514. doi: 10.1371/journal.pone.0147514. eCollection 2016.

Induction of mesenchymal stem cell chondrogenic differentiation and functional cartilage microtissue formation for in vivo cartilage regeneration by cartilage extracellular matrix-derived particles.

Yin H, Wang Y, Sun Z, Sun X, Xu Y, Li P, Meng H, Yu X, Xiao B, Fan T, Wang Y, Xu W, Wang A, Guo Q, Peng J, Lu S. *Acta Biomater.* 2016 Jan 20. pii: S1742-7061(16)30024-1. doi: 10.1016/j.actbio.2016.01.024.

Hetero-cellular prototyping by synchronized multi-material bioprinting for rotary cell culture system.

Snyder J1, Son AR, Hamid Q, Wu H, Sun W. *Biofabrication.* 2016 Jan 13;8(1):015002.

Microgravity as a means to incorporate HepG2 aggregates in polysaccharide-protein hybrid scaffold.

Sarika PR, James NR, Anilkumar PR, Raj DK, Kumary TV. *J Mater Sci Mater Med.* 2016 Feb;27(2):27. doi: 10.1007/s10856-015-5638-5.

Pediatric laryngotracheal reconstruction with tissue-engineered cartilage in a rabbit model.

Jacobs IN, Redden RA, Goldberg R, Hast M, Salowe R, Mauck RL, Doolin EJ. *Laryngoscope.* 2016 Jan;126 Suppl 1:S5-21. doi: 10.1002/lary.25676.

Integrated Biophysical and Biochemical Signals Augment Megakaryopoiesis and Thrombopoiesis in a Three-Dimensional Rotary Culture System.

Yang Y, Liu C, Lei X, Wang H, Su P, Ru Y, Ruan X, Duan E, Feng S, Han M, Xu Y, Shi L, Jiang E, Zhou J. *Stem Cells Transl Med.* 2015 Dec 23. pii: sctm.2015-0080

Hypoxia Created Human Mesenchymal Stem Cell Sheet for Prevascularized 3D Tissue Construction.

Zhang L, Xing Q, Qian Z, Tahtinen M, Zhang Z, Shearier E, Qi S, Zhao F. *Adv Healthc Mater.* 2015 Dec 14. doi: 10.1002/adhm.2

Adrenomedullin is a key Protein Mediating Rotary Cell Culture System that Induces the Effects of Simulated Microgravity on Human Breast Cancer Cells

Li Chen, Xi Yang, Xiang Cui, Minmin Jiang, Yu Gui, Yanni Zhang, Xiangdong Luo *Microgravity Science and Technology*
November 2015, Volume 27, Issue 6, pp 417-426.

High throughput de novo RNA sequencing elucidates novel responses in Penicillium chrysogenum under microgravity.

Sathishkumar Y, Krishnaraj C, Rajagopal K, Sen D., Lee YS. *Bioprocess Biosyst Eng.* 2015 Nov 24.

Scaffold-free and scaffold-assisted 3D culture enhances differentiation of bone marrow stromal cells.

Vidyasekar P, Shyamsunder P, Sahoo SK, Verma RS, *In Vitro Cell Dev Biol Anim.* 2015 Nov 5.

3D rotating wall vessel and 2D cell culture of four veterinary virus pathogens: A comparison of virus yields, portions of infectious particles and virus growth curves.

Malenovská H. *J Virol Methods*. 2015 Nov 9. pii: S0166-0934(15)00356-0. doi: 10.1016/j.jviromet.2015.11.002.

Scaffold-free, Human Mesenchymal Stem Cell-Based Tissue Engineered Blood Vessels.

Jung Y, Ji H, Chen Z, Fai Chan H, Atchison L, Klitzman B, Truskey G, Leong KW.

Sci Rep. 2015 Oct 12;5:15116. doi: 10.1038/srep15116.

Effect of Culture in Simulated Microgravity on the Development of Mouse Embryonic Testes.

Nowacki D, Klinger FG, Mazur G, Felici MD. *Adv Clin Exp Med*. 2015 Sep-Oct;24(5):769-74. doi: 10.17219/acem/27920.

Genome Wide Expression Profiling of Cancer Cell Lines Cultured in Microgravity Reveals Significant Dysregulation of Cell Cycle and MicroRNA Gene Networks

Prasanna Vidyasekar, Pavithra Shyamsunder, Rajpranap Arun, Rajalakshmi Santhakumar, Nand Kishore Kapadia, Ravi Kumar, and Rama Shanker Verma

PLoS One. 2015; 10(8): e0135958. Published online 2015 Aug 21. doi: 10.1371/journal.pone.0135958

From Single Cells to Engineered and Explanted Tissues: New Perspectives in Bacterial Infection Biology.

Bergmann S, Steinert M. *Int Rev Cell Mol Biol*. 2015;319:1-44. doi: 10.1016/bs.ircmb.2015.06.003. Epub 2015 Jul 21.

Simulated microgravity affects ciprofloxacin susceptibility and expression of *acrAB-tolC* genes in *E. coli* ATCC25922.

Xu B, Li C, Zheng Y, Si S, Shi Y, Huang Y, Zhang J, Cui Y, Cui Y. *Int J Clin Exp Pathol*. 2015 Jul 1;8(7):7945-52. eCollection 2015.

The Wnt Inhibitor Sclerostin Is Up-regulated by Mechanical Unloading in Osteocytes in Vitro.

Spatz JM, Wein MN, Gooi JH, Qu Y, Garr JL, Liu S, Barry KJ, Uda Y, Lai F, Dedic C, Balcells-Camps M, Kronenberg HM, Babij P, Pajevic PD. *J Biol Chem*. 2015 Jul 3;290(27):16744-58. doi: 10.1074/jbc.M114.628313. Epub 2015 May 7.

Endothelial-like malignant glioma cells in dynamic three dimensional culture identifies a role for VEGF and FGFR in a tumor-derived angiogenic response.

Smith SJ, Ward JH, Tan C, Grundy RG, Rahman R. *Oncotarget*. 2015 Jun 2.

The Effect of OSM on MC3T3-E1 Osteoblastic Cells in Simulated Microgravity with Radiation.

Goyden Goyden J, Tawara K, Hedeem D, Willey JS, Thom Oxford J, Jorcyk CL. *PLoS One*. 2015 Jun 1;10(6):e0127230. doi: 10.1371/journal.pone.0127230. eCollection 2015

Differentiation of transforming growth factor β 1-induced mesenchymal stem cells into nucleus pulposus-like cells under simulated microgravity conditions.

Han C, Jiang C, Yu C, Shen H. *Cell Mol Biol (Noisy-le-grand)*. 2015 May 16;61(2):50-5.

3D tissue-like assemblies: A novel approach to investigate virus-cell interactions.

Goodwin TJ, McCarthy M, Cohrs RJ, Kaufer BB. *Methods*. 2015 May 15. pii: S1046-2023(15)00203-0. doi: 10.1016/j.ymeth.2015.05.010.

Recellularization of decellularized lung scaffolds is enhanced by dynamic suspension culture.

Crabbé A1, Liu Y1, Sarker SF1, Bonenfant NR2, Barrila J1, Borg ZD2, Lee JJ3, Weiss DJ2, Nickerson CA4. *PLoS One*. 2015 May 11;10(5):e0126846. doi: 10.1371/journal.pone.0126846. eCollection 2015.

Use of amniotic microparticles coated with fibroblasts overexpressing SDF-1 α to create an environment conducive to neovascularization for repair of full-thickness skin defects

Zhang YQ, Ju SZ, Fang H, Zheng YJ, Luo PF, Wu HB, Wu MJ, Wang ZH, Xiao SC, Xia ZF. *Cell Transplant*. 2015 April 7; doi:10.3727/096368915X687930

Generation of Bioartificial Salivary Gland Using Whole-Organ Decellularized Bioscaffold

Gao Z, Wu T, Xu J, Liu G, Xie Y, Zhang C, Wang J, Wang S. *Cells Tissues Organs*. 2015 March 25; doi:10.00.1159/00371873

Liver-Tumor Hybrid Organoids for Modeling Tumor Growth and Drug Response In Vitro.

Skardal A, Devarasetty M, Rodman C, Atala A, Soker S. *AnnBiomed Eng*. 2015 Mar 17. doi: 10.1007/s10439-015-1298-3

Increased proliferation and adhesion properties of human dental pulp stem cells in PLGA scaffolds via simulated microgravity.

He L, Pan S, Li Y, Zhang W, Yi H, Song C, Niu Y. *Int. Endod J*. 2015 Feb 19. doi: 10.1111/iej.12441. [E pub ahead of print]

The effects of spheroid formation of adipose-derived stem cells in a microgravity bioreactor on stemness properties and therapeutic potential.

Zhang S, Liu P, Chen L, Wang Y, Wang Z, Zhang B. *Biomaterials*. 2015 Feb;41:15-25. doi: 10.1016/j.biomaterials.2014.11.019. Epub 2014 Dec 1.

Establishment of a rotary aerobic culture system for in vitro culture of mouse testis.

Liu Y, Zhu YF, Gao ZB, Li M, Zhong LY, Yin DJ, Li Y, Nan Fang Yi Ke Da Xue Xue Bao. 2015 Jan 20;35(1):66-71 [Article in Chinese]

A mesoscale study of the degradation of bone structural properties in modeled microgravity conditions.

Cosmi F, Steimberg N, Mazzoleni G. *J Mech Behav Biomed Mater*. 2015 Jan 12;44C:61-70. doi: 10.1016/j.jmbbm.2015.01.002

RCCS Bioreactor-Based Modelled Microgravity Induces Significant Changes on In Vitro 3D Neuroglial Cell Cultures.

Morabito C, Steimberg N, Mazzoleni G, Guarnieri S, Fano-Illic G, Mariggio MA. *Biomed Res Int*. 2015 Jan 13; 2015:754283. doi 10:1155/2015/754283

3D culture of isolated cells: A fast and efficient method for optimising their histochemical and immunocytochemical analyses.

Berenzi A, Steimberg N, Boniotti J, Mazzoleni G. *Microsc Res Tech*. 2015 Jan 29. doi:10.1002/jemt.22470[

Low gravity rotational culture and the integration of immunomodulatory stem cells reduce human islet allo-reactivity.

Qureshi KM, Lee J, Paget MB, Bailey CJ, Curnow SJ, Murray HE, Downing R. *Clin. Transplant*. 2015 Jan;29(1):90:8. doi: 10.1111/ctr.12488. Epub 2014 Dec 5.

In vitro model of placental trophoblast differentiation and cytomegalovirus infection.

Swan KF, Ferris M, Pridjian G, Morris CA, Sullivan DE. *Pregnancy Hypertens*. 2015 Jan;5 (1): 155-6. doi: 10.1016/j.preghy.2014.10.323.

Spaceflight and simulated microgravity cause a significant reduction of key gene expression in early t-cell activation.

Martinez EM, Yoshida MC, Candelario TT, Hughes-Fulford M. *Am J Physiol Regul Integr Comp Physiol*. 2015 Jan 7:ajpregu.00449.2014. doi:10.1152/ajpregu.00449.2014. [Epub ahead of print]

Chondrogenic differentiation of human adipose-derived stem cells using microcarrier and bioreactor combination technique.

Kang H, Lu S, Peng J, Yang Q, Liu S, Zhang L, Huang J, Sui X, Zhao B, Wang A, Xu W, Guo Q, Song Q. *Mol Med Rep*. 2015 Feb;11(2): 1195-9. doi: 10.3892/mmr.2014.2820. Epub 2014 Oct 30.

Spheroid cultures promote the stemness of corneal stromal cells.

Li H1, Dai Y2, Shu J3, Yu R4, Guo Y2, Chen J5. *Tissue Cell*. 2014 Nov 7. pii: S0040-8166(14)00116-5. doi: 10.1016/j.tice.2014.10.008 [Epub ahead of print]

Mouse undifferentiated spermatogonial stem cells cultured as aggregates under simulated microgravity. Zhang X, Li L, Bai Y, Shi R, Wei H, Zhang S. *Andrologia*. 2014 Nov;46(9):1013-21. doi: 10.1111/and.12189.

Non-genetic direct reprogramming and biomimetic platforms in a preliminary study for adipose-derived stem cells into corneal endothelia-like cells. Dai Y, Guo Y, Wang C, Liu Q, Yang Y, Li S, Guo X, Lian R, Yu R, Liu H, Chen J. *PLoS One*. 2014 Oct 15;9(10):e109856. doi:10.1371/journal.pone.0109856.

Chondrogenic differentiation of human adipose derived stem cells using microcarrier and bioreactor combination technique. Kang H, Lu S, Peng J, Yang Q, Liu S, Zhang L, Huang J, Sui X, Zhao B, Wang A, Xu W, Guo Q, Song Q. *Mol Med Rep*. 2014 Oct 30. doi: 10.3892/mmr.2014.2820.

Effect of dynamic three-dimensional culture on osteogenic potential of human periodontal ligament-derived mesenchymal stem cells entrapped in alginate microbeads. Vecchiatini R, Penolazzi L, Lambertini E, Angelozzi M, Morganti C, Mazzitelli S, Trombelli L, Nastruzzi C, Piva R. *J Periodontal Res*. 2014 Sep 23. doi: 10.1111/jre.12225.

The impact of simulated and real microgravity on bone cells and mesenchymal stem cells Ulbrich C, Wehland M, Pietsch J, Aleshcheva G, Wise P, van Loon J, Magnusson N, Infanger M, Grosse J, Eilles C, Sundaresan A, Grimm D. *Biomed Res Int*. 2014;2014:928507. doi: 10.1155/2014/928507.

Optimal 3D culture of primary articular chondrocytes for use in the rotating wall vessel bioreactor. Mellor LF, Baker TL, Brown RJ, Catlin LW, Oxford JT. *Aviat Space Environ Med*. 2014 Aug;85(8):798-804. doi: 10.3357/ASEM.3905.2014.

Cazzaniga A, Castiglioni S, Maier JA. **Conditioned media from microvascular endothelial cells cultured in simulated microgravity inhibit osteoblast activity.** *Biomed Res Int*. 2014;2014:857934. doi: 10.1155/2014/857934.

Luo H, Zhu B, Zhang Y, Jin Y. **Tissue-Engineered Nerve Constructs Under a Microgravity System for Peripheral Nerve Regeneration.** *Tissue Eng Part A*. 2014 Sep 16. (Epub ahead of print)

Montani C, Steimberg N, Boniotti J, Biasiotto G, Zanella I, Diafera G, Biunno I, Caimi L, Mazzoleni G, Di Lorenzo D. **Fibroblasts maintained in 3 dimensions show a better differentiation state and higher sensitivity to estrogens.** *Toxicol Appl Pharmacol*. 2014 Aug 28. pii: S0041-008X(14)00313-5. doi: 10.1016/j.taap.2014.08.021.

Jiang W, Xu B, Yi Y, Huang Y, Li XO, Jiang F, Zhou J, Zhang J, Cui Y. **Effects of simulated microgravity by RCCS on the biological features of *Candida albicans*.** *Int J Clin Exp Pathol*. 2014 Jun 15;7(7):3781-90.

Teo A, Mantalaris A, Song K, Lim M **A novel perfused rotary bioreactor for cardiomyogenesis of embryonic stem cells.** *Biotechnol Lett*. 2014 May;36(5):947-60. doi:10.1007/s10529-014-1456-y.

Wei L, Liu C, Kang L, Liu Y, Shi S, Wu Q, Li Y. **Experimental study on effect of simulated microgravity on structural chromosome instability of human peripheral blood lymphocytes.** *PLoS One*. 2014 Jun 25;9(6):e100595. doi: 10.1371/journal.pone.0100595. eCollection 2014.

Girardi C, De Pittà C, Casara S, Calura E, Romualdi C, Celotti L, Mognato M. **Integration Analysis of MicroRNA and mRNA Expression Profiles in Human Peripheral Blood Lymphocytes Cultured in Modeled Microgravity.** *Biomed Res Int*. 2014;2014:296747. doi: 10.1155/2014/296747

Bacteria in the vaginal microbiome alter the innate immune response and barrier properties of the human vaginal epithelia in a species-specific manner. Doerflinger SY1, Throop AL2, Herbst-Kralovetz MM2. *J Infect Dis*. 2014 Jun 15;209(12):1989-99. doi: 10.1093/infdis/jiu004. Epub 2014 Jan 7.

Soni A, O'Sullivan L, Quick LN, Ott C, Nickerson CA, Wilson JW. **Conservation of the Low-shear Modeled Microgravity Response in Enterobacteriaceae and Analysis of the trp Genes in this Response.** *Open Microbiol J*. 2014 Jun 13;8:51-8. doi: 10.2174/1874285801408010051.

Fauzi I, Panoskaltzis N, Mantalaris A. **Early exposure of murine embryonic stem cells to hematopoietic cytokines differentially directs definitive erythropoiesis and cardiomyogenesis in alginate hydrogel three-dimensional cultures.** *Stem Cells Dev.* 2014 Jun 13. (Epub ahead of print)

Tai J, Cheung SS, Hasman D. **Human Ovarian Cancer Multicellular Spheroids: A Model for Testing Antiproliferation Activity of Devil's Club (*Oplonanax horridus*) and Anticancer Agents.** *Planta Med.* 2014 Jun;80(8-9):662-70. doi: 10.1055/s-0034-1368506.

Lei X, Deng Z, Zhang H, Zhao H, Zhou J, Liu S, Chen Q, Ning L, Cao Y, Wang X, Zhang X, Duan E. **Rotary Suspension Culture Enhances Mesendoderm Differentiation of Embryonic Stem Cells Through Modulation of Wnt/ β -catenin Pathway.** *Stem Cell Rev.* 2014 May 4. (Epub ahead of print)

David J, Sayer NM, Sarkar-Tyson M. **The use of a three-dimensional cell culture model to investigate host-pathogen interactions of *Francisella tularensis* in human lung epithelial cells.** *Microbes Infect.* 2014 May 4. pii: S1286-4579(14)00053-7. doi: 10.1016/j.micinf.2014.04.001.

Chen R, Dong Y, Xie X, Chen J, Gao D, Liu Y, Ren Z, Cui J. **Screening candidate metastasis-associated genes in three-dimensional HCC spheroids with different metastasis potential.** *Int J Clin Exp Pathol.* 2014 Apr 15;7(5):2527-35. eCollection 2014.

Tropitzsch A, Arnold H, Bassiouni M, Müller A, Eckhard A, Müller M, Löwenheim H. **Assessing cisplatin-induced ototoxicity and otoprotection in whole organ culture of the mouse inner ear in simulated microgravity.** *Toxicol Lett.* 2014 Apr 5. pii: S0378-4274(14)00144-1. doi: 10.1016/j.toxlet.2014.03.022.

Warnock JJ, Fox DB, Stoker AM, Beatty M, Cockrell M, Janicek JC, Cook JL. **Culture of equine fibroblast-like synoviocytes on synthetic tissue scaffolds towards meniscal tissue engineering: a preliminary cell-seeding study.** *PeerJ.* 2014 Apr 17;2:e353. doi: 10.7717/peerj.353. eCollection 2014.

Chen RX, Song HY, Dong YY, Hu C, Zheng QD, Xue TC, Liu XH, Zhang Y, Chen J, Ren ZG, Liu YK, Cui JF. **Dynamic expression patterns of differential proteins during early invasion of hepatocellular carcinoma.** *PLoS One.* 2014 Mar 10;9(3):e88543. doi: 10.1371/journal.pone.0088543. eCollection 2014.

Grimm D, Wehland M, Pietsch J, Aleshcheva G, Wise P, van Loon J, Ulbrich C, Magnusson NE, Infanger M, Bauer J. **Growing tissues in real and simulated microgravity - new methods for tissue engineering.** *Tissue Eng Part B Rev.* 2014 Mar 5. (Epub ahead of print)

Redden RA, Iyer R, Brodeur GM, Doolin EJ. **Rotary bioreactor culture can discern specific behavior phenotypes in *Trk*-null and *Trk*-expressing neuroblastoma cell lines.** *In Vitro Cell Dev Biol Anim.* 2014 Jan 30. (Epub ahead of print)

Sambandam Y, Townsend MT, Pierce JJ, Lipman CM1, Haque A, Bateman TA, Reddy SV. **Microgravity control of autophagy modulates osteoclastogenesis.** *Bone.* 2014 Jan 23. pii: S8756-3282(14)00006-4. doi: 10.1016/j.bone.2014.01.004.

Chang TT, Hughes-Fulford M. **Molecular mechanisms underlying the enhanced functions of three-dimensional hepatocyte aggregates.** *Biomaterials.* 2014 Feb;35(7):2162-71. doi: 10.1016/j.biomaterials.2013.11.063.

GENERAL REVIEW ARTICLES

Effect of Rotation on Scaffold Motion and Cell Growth in Rotating Bioreactors.

Varley MC, Markaki AE, Brooks RA. *Tissue Eng Part A.* 2017 Jan 26. doi: 10.1089/ten.TEA.2016.0357.

Three-Dimensional Rotating Wall Vessel-Derived Cell Culture Models for Studying Virus-Host Interactions.

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Scaffold-free Tissue Formation Under Real and Simulated Microgravity Conditions.

Aleshcheva G, Bauer J, Hemmersbach R, Slumstrup L, Wehland M, Infanger M, Grimm D. *Basic Clin Pharmacol Toxicol*. 2016 Oct;119 Suppl 3:26-33. doi: 10.1111/bcpt.12561.

The International Space Station: an Extreme Environment for Key Host-Microbe Discoveries

C. Mark Ott, Thomas Marshburn, and Cheryl A. Nickerson. *Microbe*—Volume 11, Number 6, 2016, Pages 253-261.

From Single Cells to Engineered and Explanted Tissues: New Perspectives in Bacterial Infection Biology.

Bergmann S, Steinert M. *Int Rev Cell Mol Biol*. 2015;319:1-44. doi: 10.1016/bs.ircmb.2015.06.003. Epub 2015 Jul 21.

Grimm D, Wehland M, Pietsch J, Aleshcheva G, Wise P, van Loon J, Ulbrich C, Magnusson NE, Infanger M, Bauer J. **Growing tissues in real and simulated microgravity - new methods for tissue engineering.** *Tissue Eng Part B Rev*. 2014 Mar 5. (Epub ahead of print)

Gaspar DA, Gomide V, Monteiro FJ. **The role of perfusion bioreactors in bone tissue engineering.** *Biomatter*. 2012 Oct 1;2(4):167-75. doi: 10.4161/biom.22170.

Radtke AL, Herbst-Kralovetz MM. **Culturing and applications of rotating wall vessel bioreactor derived 3D epithelial cell models.** *J Vis Exp*. 2012 Apr 3;(62). pii: 3868. doi: 10.3791/3868. *Video Article

Cartmell SH, Rathbone S, Jones G, Hidalgo-Bastida LA. **3D sample preparation for orthopaedic tissue engineering bioreactors.** (Book chapter in *3D Cell Culture: Methods and Protocols*, ISBN 978-1-60761-983-3)
Rauh J, Milan F, Günther KP, Stiehler M. **Bioreactor systems for bone tissue engineering.** *Tissue Eng Part B Rev*. 2011 Aug;17(4):263-80.

Barrila J, Radtke AL, Crabbe A, Sarker SF, Herbst-Kralovetz MM, Ott, CM, Nickerson CA. **Organotypic 3D cell culture models: using the rotating wall vessel to study host-pathogen interactions.** *Nature Rev Microbiol* 8:791-801, 2010

Rosenzweig JA, Abogunde O, Thomas K, Lawal A, Nguyen YU, Sodipe A, Jejelowo O. **Spaceflight and modeled microgravity effects on microbial growth and virulence.** *Appl Microbiol Biotechnol* 85:885-891, 2010

Navran S. **The application of low shear modeled microgravity to 3-D cell biology and tissue engineering.** *Biotechnol Ann Rev*. 14: 275-296, 2008

Nickerson CA, Ott CM, Wilson JW, Ramamurthy R, LeBlanc CL, et al.: **Low-Shear Modeled Microgravity: A Global Environmental Regulatory Signal Affecting Bacterial Gene Expression, Physiology, and Pathogenesis.** *Journal of Microbiol Methods* 54:1-11, 2003

Hammond TG, and Hammond JM: **Optimized Suspension Culture: The Rotating-Wall Vessel.** *Am J Physiol Renal Physiol* 281: F12-F25, 2001

Unsworth BR and Lelkes PI: **Growing Tissues in Microgravity.** *Nature Medicine* 4: 901-907, 1998.

Duray PH, Hatfill SJ and Pellis NR: **Tissue Culture in Microgravity.** *Science & Medicine*, 4: 45-55, 1997.

BONE

Three-dimensional simulated microgravity culture improves the proliferation and odontogenic differentiation of dental pulp stem cell in PLGA scaffolds implanted in mice.

Li Y, He L, Pan S, Zhang L, Zhang W, Yi H, Niu Y. *Mol Med Rep*. 2017 Feb;15(2):873-878. doi: 10.3892/mmr.2016.6042.

Microgravity Induction of TRAIL Expression in Preosteoclast Cells Enhances Osteoclast Differentiation.

Sambandam Y, Baird KL, Stroebel M, Kowal E, Balasubramanian S, Reddy SV. *Sci Rep*. 2016 May 4;6:25143. doi: 10.1038/srep25143.

Establishment of a 3D-dynamic osteoblasts-osteoclasts co-culture model to simulate the jawbone microenvironment in vitro.

Penolazzi L, Lolli A, Sardelli L, Angelozzi M, Lambertini E, Trombelli L, Ciarpella F, RenataVecchiatini, Piva R. *Life Sci.* 2016 Mar 22. pii: S0024-3205(16)30151-5. doi: 10.1016/j.lfs.2016.03.035.

The Wnt Inhibitor Sclerostin Is Up-regulated by Mechanical Unloading in Osteocytes in Vitro.

Spatz JM, Wein MN, Gooi JH, Qu Y, Garr JL, Liu S, Barry KJ, Uda Y, Lai F, Dedic C, Balcells-Camps M, Kronenberg HM, Babij P, Pajevic PD. *J Biol Chem.* 2015 Jul 3;290(27):16744-58. doi: 10.1074/jbc.M114.628313. Epub 2015 May 7.

The Effect of OSM on MC3T3-E1 Osteoblastic Cells in Simulated Microgravity with Radiation.

Goyden Goyden J, Tawara K, Hedeem D, Willey JS, Thom Oxford J, Jorcyk CL. *PLoS One.* 2015 Jun 1;10(6):e0127230. doi: 10.1371/journal.pone.0127230. eCollection 2015

A mesoscale study of the degradation of bone structural properties in modeled microgravity conditions.

Cosmi F, Steimberg N, Mazzoleni G. *J Mech Behav Biomed Mater.* 2015 Jan 12;44C:61-70. doi: 10.1016/j.jmbbm.2015.01.002

Vecchiatini R, Penolazzi L, Lambertini E, Angelozzi M, Morganti C, Mazzitelli S, Trombelli L, Nastruzzi C, Piva R. **Effect of dynamic three-dimensional culture on osteogenic potential of human periodontal ligament-derived mesenchymal stem cells entrapped in alginate microbeads.** *J Periodont Res.* 2014 Sep 23. doi: 10.1111/jre.12225.

Sambandam Y, Townsend MT, Pierce JJ, Lipman CM1, Haque A, Bateman TA, Reddy SV. **Microgravity control of autophagy modulates osteoclastogenesis.** *Bone.* 2014 Jan 23. pii: S8756-3282(14)00006-4. doi: 10.1016/j.bone.2014.01.004.

Lv Q, Deng M, Ulery BD, Nair LS, Laurencin CT. **Nano-ceramic composite scaffolds for bioreactor-based bone engineering.** *Clin Orthop Relat Res.* 2013 Aug;471(8):2422-33. doi: 10.1007/s11999-013-2859-0.

Sun L, Yang C, Ge Y, Yu M, Chen G, Guo W, Tian W. **In vitro three-dimensional development of mouse molar tooth germs in a rotary cell culture system.** *Int J Paediatr Dent.* 2013 Jul 19. doi: 10.1111/ipd.12057.

Gaspar DA, Gomide V, Monteiro FJ. **The role of perfusion bioreactors in bone tissue engineering.** *Biomatter.* 2012 Oct 1;2(4):167-75. doi: 10.4161/biom.22170.

Song K, Wang H, Zhang B, Lim M, Liu Y, Liu T; **Numerical simulation of fluid field and in vitro three-dimensional fabrication of tissue-engineered bones in a rotating bioreactor and in vivo implantation for repairing segmental bone defects.** *Cell Stress Chaperones.* 2012 Oct 5. [Epub ahead of print]

Nishi M, Matsumoto R, Dong J, Uemura T. **Engineered bone tissue associated with vascularization utilizing a rotating wall vessel bioreactor.** *J Biomed Mater Res A.* 2012 Aug 3. doi: 10.1002/jbm.a.34340

Cerwinka WH, Sharp SM, Boyan BD, Zhau HE, Chung LWK, Yates C; **Differentiation of human mesenchymal stem cell spheroids under microgravity conditions.** *Cell Regeneration* 2012, 1:2

Shuang F, Sun Y, Yang HH, Shao YC, Li H, Hu W, Zhong J, Zou HX. **Destrin deletion enhances the bone loss in hindlimb suspended mice.** *Eur J Appl Physiol.* 2012 Jul 6. (ePublication ahead of print)

Aoyagi H, Kuroda A. **Effects of low-shear modeled microgravity on a microbial community filtered through a 0.2- μ m filter and its potential application in screening for novel microorganisms.** *J Biosci Bioeng.* 2012 Jul;114(1):73-9. doi: 10.1016/j.jbiosc.2012.02.021. Epub 2012 May 8.

Li Y, Li S, Niu ZY, Bao B, Shi X. **The effect of Smads signal pathway on the osteogenesis of human periodontal ligament stem cells in simulated microgravity.** *Shanghai Kou Qiang Yi Xue.* 2012 Jun;21(3):246-50. (Abstract in English, Article in Chinese)

Weszl M, Skaliczki G, Cselenyák A, Kiss L, Major T, Schandl K, Bognár E, Stadler G, Peterbauer A, Csöngé L. **Freeze-dried human serum albumin improves the adherence and proliferation of mesenchymal stem cells on mineralized human bone allografts.** *J Orthop Res.* 2012 Mar;30(3):489-96.

Hoz L, Romo E, Zeichner-David M, Sanz M, Nuñez J, Gaitán L, Mercado G, Arzate H., **Cementum protein 1 (CEMP1) induces differentiation by human periodontal ligament cells under three-dimensional culture conditions.** *Cell Biol Int.* 2012 Feb 1;36(2):129-36.

Cartmell SH, Rathbone S, Jones G, Hidalgo-Bastida LA. **3D sample preparation for orthopaedic tissue engineering bioreactors.** (Book chapter in 3D Cell Culture: Methods and Protocols, ISBN 978-1-60761-983-3)

Rauh J, Milan F, Günther KP, Stiehler M. **Bioreactor systems for bone tissue engineering.** *Tissue Eng Part B Rev.* 2011 Aug;17(4):263-80.

Li P, Zhang Y, Wang YM, Duan CM, Hao T, Wu BL, Wang CY. **RCCS enhances EOE cell proliferation and their differentiation into ameloblasts.** *Mol Biol Rep.* Epub June 2011

Yeatts AB, Fisher JP. **Bone tissue engineering bioreactors: dynamic culture and the influence of shear stress.** *Bone;* 48(2):171-81. 2011

Sambandam Y, Blanchard JJ, Daughtridge G, Kolb RJ, Shanmugarajan S, Pandrurada SN, Bateman TA, Redd., **Microarray profile of gene expression during osteoclast differentiation in modelled microgravity.** *J Cell Biochem.* 2010 Dec 1;111(5):1179-87.

Sheyn D, Pelled G, Netanel D, Domany E, Gazit D. **The effect of simulated microgravity on human mesenchymal stem cells cultured in an osteogenic differentiation system: a bioinformatics study.** *Tissue Eng Part A.* 16(11):3403-12, 2010

Lee KW, Wang S, Dadsetan M, Yaszemski MJ, Lu L. **Enhanced cell ingrowth and proliferation through three dimensional nano composite scaffolds with controlled pore structures.** *Biomacromolecules.* 11:682-9, 2010.

Ko YJ, Zaharias RS, Seabold DA, Lafoon JE, Schneider GB. **Analysis of the attachment and differentiation of three-dimensional rotary wall vessel cultured human preosteoblasts on dental implant surfaces.** *Int J Oral Maxillofac Implants* 25:722-728, 2010

Sailon AM, Allori AC, Davidson EH, Reformat DD, Allen RJ, Warren SM. **A novel flow-perfusion bioreactor supports 3D dynamic cell culture.** *J Biomed Biotechnol.* 2009;2009:873816

Jin F, Zhang Y, Xuan K, He D, Deng T, Tang L, Lu W, Duan Y. **Establishment of three-dimensional tissue-engineered bone constructs under microgravity-simulating conditions.** *Artif Organs* 34: 118-125, 2009

Li S, Ma Z, Niu Z, Qian H, Xuan D, Hou R, Ni L. **NASA approved rotary bioreactor enhances proliferation and osteogenesis of human periodontal ligament stem cells.** *Stem Cells Dev.* 18:1273-82, 2009

Capulli M, Rufo A, Teti A, Rucci N. **Global transcriptome analysis in mouse calvarial osteoblasts highlights sets of genes regulated by modeled microgravity and identifies a "mechanoresponsive osteoblast gene signature".** *J. Cell Biochem.* 107:240-52, 2009

Lv Q, Nair L, Laurencin CT. **Fabrication, characterization, and in vitro evaluation of poly(lactic acid glycolic acid)/nano-hydroxyapatite composite microsphere-based scaffolds for bone tissue engineering in rotating bioreactors.** *J Biomed Mater Res A* 91:679-691, 2009

Saxena R, McDonald J. **Osteoblast and Osteoclast Differentiation in Modeled Microgravity.** *Ann NY Acad Sci.* 1116: 494-498, 2007

Song KD, Liu TQ, Li XQ, Cui ZF, Sun XY, Ma XH. **Three-dimensional expansion: in suspension culture of SD rat's osteoblasts in a rotating wall vessel bioreactor.** *Biomed Environ Sci* 20: 91-98, 2007

Yoshioka T, Mishima H, Ohyabu Y, Sakai S, Akaogi H, Ishii T, Kojima H, Tanaka J, Ochiai N, Uemura T. **Repair of large osteochondral defects with allogenic cartilaginous aggregates formed from bone marrow-derived cells using RWV bioreactor.** *J Orthop Res* 25:1291-1298, 2007

Bucaro MA, Zahm AM, Risbud MV, Ayyaswamy PS, Mukundakrishnan K, Steinbeck MJ, Shapiro IM, Adams CS. **The effect of simulated microgravity on osteoblasts is independent of the induction of apoptosis.** *J Cell Biochem* 102: 483-495, 2007

Inac B, Eser Elcin A, Koc A, Balos K, Parlar A, Murat Elcin Y. **Encapsulation and osteoinduction of human periodontal ligament fibroblasts in chitosan-hydroxyapatite microspheres.** *Biomed Mater Res A* 82: 917-926, 2007

Zheng Q, Huang G, Xu Y, Guo C, Xi Y, Pan Z, Wang J. **Could the effect of modeled microgravity on osteogenic differentiation of human mesenchymal stem cells be reversed by regulation of signaling pathways?.** *Biol Chem* 388: 755-763, 2007

Pound JC, Green DW, Roach HI, Mann S, Oreffo RO. **An ex vivo model for chondrogenesis and osteogenesis.** *Biomaterials* 28:2839-2849, 2007

Pound JC, Green DW, Chaudhuri JB, Mann S, Roach HI, Oreffo RO. **Strategies to Promote Chondrogenesis and Osteogenesis from Human Bone Marrow Cells and Articular Chondrocytes Encapsulated in Polysaccharide Templates.** *Tissue Eng* 12:2789-2799, 2006

Rucci N, Rufo A, Alamanou M, Teti A. **Modeled microgravity stimulates osteoclastogenesis and bone resorption by increasing osteoblast RANK/OPG ratio.** *J. Cell. Biochem.* 100: 464-473, 2007

Song K, Yang Z, Liu T, Zhi W, Li X, Deng L, Cui Z, Ma X. **Fabrication and detection of tissue-engineered bones with bio-derived scaffolds in a rotating bioreactor.** *Biotechnol. Appl. Biochem.* 45(pt 2): 65-74, 2006

Marolt D, Augst A, Freed LE, Vepari C, Fajardo R, Patel N, Gray M, Farley M, Kaplan D, Vunjak-Novakovic G. **Bone and cartilage tissue constructs grown using human bone marrow stromal cells, silk scaffolds and rotating bioreactors.** *Biomaterials* 27: 6138-6149, 2006

Akmal M, Anand A, Anand B, Wiseman M, Goodship AE, Bentley G: **The culture of articular chondrocytes in hydrogel constructs within a bioreactor enhances cell proliferation and matrix synthesis.** *J Bone Joint Surg Br* 88: 544-553, 2006.

Inanc B, Elcin AE, Elcin YM: **Osteogenic Induction of Human Periodontal Ligament Fibroblasts Under Two- and Three- Dimensional Culture Conditions.** *Tissue Eng.* 12: 257-266, 2006.

Facer SR, Zaharias RS, ME Andracki, Lafoon J, Hunter SK, Schneider GB. **Rotary Culture enhances pre-osteoblast aggregation and mineralization.** *J Dent Res* 84:542-547, 2005.

Mukundakrishnan K, Ayyaswamy PS, Risbud M, Hu HH, Shapiro IM: **Modeling of Phosphate Ion Transfer to the Surface of Osteoblasts Under Normal Gravity and Simulated Microgravity Conditions.** *Ann N Y Acad Sci.* 1027:85-98, 2004.

Bucaro MA, Fertala J, Adams CS, Steinbeck M, Ayyaswamy P, Mukundakrishnan K, Shapiro IM, Risbud MV: **Bone Cell Survival in Microgravity: Evidence That Modeled Microgravity Increases Osteoblast Sensitivity to Apoptogens.** *Ann N Y Acad Sci* 1027:64-73, 2004.

Yu X, Botchwey EA, Levine EM, Pollack SR, Laurencin CT: **Bioreactor-based Bone Tissue Engineering: The Influence of Dynamic Flow on Osteoblast Phenotypic Expression and Matrix Mineralization.** *Proc Natl Acad Sci* 101: 11203-11208, 2004.

Ontiveros C, Irwin R, Wiseman RW, McCabe LR: **Hypoxia Suppresses Runx2 Independent of Modeled Microgravity.** *J Cell Physiol* 200: 169-176, 2004.

Klement BJ, Young QM, George BJ, Nokkaew M: **Skeletal Tissue Growth, Differentiation, and Mineralization in the NASA Rotating Wall Vessel.** *Bone* 34: 487-498, 2004.

Torday JS: **Parathyroid hormone-related protein is a gravisensor in lung and bone cell biology.** *Adv Space Research*, 32, 1569-1576, 2003.

Botchwey EA, Pollack SR, El-Amin S, Levine EM, Tuan RS and Laurencin CT: **Human Osteoblast-Like Cells in Three-Dimensional Culture with Fluid Flow.** *Biorheology* 40:299-306, 2003.

Tang K, Dang G and Guo Z: **The Effects of Intermittent Hydromechanics on the Differentiation and Function of Bone Marrow Stromal Derived-osteoblasts in Porous Calcium Phosphate Ceramics.** *Zhonghua Yi Xue Za Zhi* 82: 665-668, 2002.

Rucci N, Migliaccio S, Zani BM, Taranta A, and Teti A, **Characterization of the Osteoblast-like Cell Phenotype Under Microgravity Conditions in the NASA-approved Rotating Wall Vessel Bioreactor (RWV),** *J Cell Biochem* 85:167-179, 2002.

Botchwey EA, Pollack SR, Levine EM and Laurencin CT: **Bone Tissue Engineering in a Rotating Bioreactor Using a Microcarrier Matrix System.** *J Biomed Mater Res* 55: 242-253, 2001

Radin S, Ducheyne P, Ayyaswamy PS and Gao H: **Surface Transformation of Bioactive Glass in Bioreactors Simulating Microgravity Conditions. Part I: Experimental Study.** *Biotechnol Bioeng* 75:369-378, 2001.

Gao H, Ayyaswamy PS, Ducheyne P, Radin S: **Surface Transformation of Bioactive Glass in Bioreactors Simulating Microgravity Conditions: Part II: Numerical Simulations.** *Biotechnol Bioeng* 75:379-385, 2001.

Qiu QQ, Ducheyne P. and Ayyaswamy PS: **3D Bone Tissue Engineered with Bioactive Microspheres in Simulated Microgravity.** *In Vitro Cell Dev Biol Anim* 37: 157-165, 2001.

Qiu QQ, Ducheyne P, Ayyaswamy PS: **Fabrication, Characterization and Evaluation of Bioceramic Hollow Microspheres Used as Microcarriers for 3-D Bone Tissue Formation in Rotating Bioreactors.** *Biomaterials* 20: 989-1001, 1999.

Granet C, Laroche N, Vico L, Alexandre C, Lafage Proust MH: **Rotating-Wall Vessels, Promising Bioreactors for Osteoblastic Cell Culture: Comparison with Other 3D Conditions.** *Med Biol Eng Comput* 36: 513-519, 1998.

CANCER

Paclitaxel-releasing mesenchymal stromal cells inhibit the growth of multiple myeloma cells in a dynamic 3D culture system.

Bonomi A, Steimberg N, Benetti A, Berenzi A, Alessandri G, Pascucci L, Boniotti J, Coccè V, Sordi V, Pessina A, Mazzoleni G. *Hematol Oncol.* 2016 Jun 10. doi: 10.1002/hon.2306.

Adrenomedullin is a key Protein Mediating Rotary Cell Culture System that Induces the Effects of Simulated Microgravity on Human Breast Cancer Cells

Li Chen, Xi Yang, Xiang Cui, Minmin Jiang, Yu Gui, Yanni Zhang, Xiangdong Luo *Microgravity Science and Technology*

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Genome Wide Expression Profiling of Cancer Cell Lines Cultured in Microgravity Reveals Significant Dysregulation of Cell Cycle and MicroRNA Gene Networks

Prasanna Vidyasekar, Pavithra Shyamsunder, Rajpranap Arun, Rajalakshmi Santhakumar, Nand Kishore Kapadia, Ravi Kumar, and Rama Shanker Verma

PLoS One. 2015; 10(8): e0135958. Published online 2015 Aug 21. doi: 10.1371/journal.pone.0135958

Endothelial-like malignant glioma cells in dynamic three dimensional culture identifies a role for VEGF and FGFR in a tumor-derived angiogenic response.

Smith SJ, Ward JH, Tan C, Grundy RG, Rahman R. *Oncotarget*. 2015 Jun 2.

Tai J, Cheung SS, Hasman D. **Human Ovarian Cancer Multicellular Spheroids: A Model for Testing Antiproliferation Activity of Devil's Club (*Oplopanax horridus*) and Anticancer Agents.** *Planta Med*. 2014 Jun;80(8-9):662-70. doi: 10.1055/s-0034-1368506.

Chen R, Dong Y, Xie X, Chen J, Gao D, Liu Y, Ren Z, Cui J. **Screening candidate metastasis-associated genes in three-dimensional HCC spheroids with different metastasis potential.** *Int J Clin Exp Pathol*. 2014 Apr 15;7(5):2527-35. eCollection 2014.

Redden RA, Iyer R, Brodeur GM, Doolin EJ. **Rotary bioreactor culture can discern specific behavior phenotypes in Trk-null and Trk-expressing neuroblastoma cell lines.** *In Vitro Cell Dev Biol Anim*. 2014 Jan 30. (Epub ahead of print)

Tai J, Cheung SS, Ou D, Warnock GL, Hasman D. **Antiproliferation activity of Devil's club (*Oplopanax horridus*) and anticancer agents on human pancreatic cancer multicellular spheroids.** *Phytomedicine*. 2013 Nov 8. pii: S0944-7113(13)00401-7. doi: 10.1016/j.phymed.2013.10.003.

Ferrarini M, Steimberg N, Ponzoni M, Belloni D, Berenzi A, Girlanda S, Caligaris-Cappio F, Mazzoleni G, Ferrero E. **Ex-Vivo Dynamic 3-D Culture of Human Tissues in the RCCS™ Bioreactor Allows the Study of Multiple Myeloma Biology and Response to Therapy.** *PLoS One*. 2013 Aug 26;8(8):e71613. doi: 10.1371/journal.pone.0071613.

Sung SY, Liao CH, Wu HP, Hsiao WC, Wu IH, Jinpu, Yu, Lin SH, Hsieh CL. **Loss of Let-7 MicroRNA Upregulates IL-6 in Bone Marrow-Derived Mesenchymal Stem Cells Triggering a Reactive Stromal Response to Prostate Cancer.** *PLoS One*. 2013 Aug 19;8(8):e71637. doi: 10.1371/journal.pone.0071637.

Smith SJ, Wilson M, Ward JH, Rahman CV, Peet AC, Macarthur DC, Rose FR, Grundy RG, Rahman R. **Recapitulation of Tumor Heterogeneity and Molecular Signatures in a 3D Brain Cancer Model with Decreased Sensitivity to Histone Deacetylase Inhibition.** *PLoS One*. 2012;7(12):e52335. doi: 10.1371/journal.pone.0052335.

Kreiseder B, Orel L, Bujnow C, Buschek S, Pflueger M, Schuett W, Hundsberger H, de Martin R, Wiesner C. **α -Catulin downregulates E-cadherin and promotes melanoma progression and invasion.** *Int J Cancer*. 2013 Feb 1;132(3):521-30. doi: 10.1002/ijc.27698. Epub 2012 Jul 14.

Quail DF, Maciel TJ, Rogers K, Postovit LM. **A unique 3D in vitro cellular invasion assay.** *J Biomol Screen*. 2012 Sep;17(8):1088-95. doi: 10.1177/1087057112449863. Epub 2012 Jun 15.

Wei L, Han F, Yue L, Zheng H, Yu D, Ma X, Cheng H, Li Y. **Synergistic Effects of Incubation in Rotating Bioreactors and Cumulative Low Dose⁶⁰Co γ -ray Irradiation on Human Immortal Lymphoblastoid Cells.** *Microgravity Science and Technology*. 2012 Nov; 24(5): 335-344. doi: 10.1007/s12217-012-9324-7.

Puca A, Russo G, Giordano A. **Properties of mechano-transduction via simulated microgravity and its effects on intracellular trafficking of VEGFR's.** *Oncotarget*. 2012 Apr;3(4):426-34.

Ma CYJ, Panoskaltis N, Kumar R, Xu XY, Mantalaris A. **Simulation of ex vivo bone marrow culture: Application to chronic myeloid leukaemia growth model.** *Biochemical Engineering Journal*. 2012 Feb 15;61:66-77. doi: 10.1016/j.bej.2011.10.002.

Zheng H, Tian W, Yan H, Yue L, Zhang Y, Han F, Chen X, Li Y. **Rotary culture promotes the proliferation of MCF-7 cells encapsulated in three-dimensional collagen-alginate hydrogels via activation of the ERK1/2-MAPK pathway.** *Biomed Mater*. 2012 Feb; 7(1):015003. doi: 10.1088/1748-6041/7/1/015003.

Kaur P, Ward B, Saha B, Young L, Groshen S, Techy G, Lu Y, Atkinson R, Taylor CR, Ingram M, Imam SA., **Human breast cancer histoid: an in vitro 3-dimensional co-culture model that mimics breast cancer tissue.** *J Histochem Cytochem.* 2011 Dec;59(12):1087-100.

Redden RA, Doolin EJ. **Microgravity assay of neuroblastoma: in vitro aggregation kinetics and organoid morphology correlate with MYCN expression.** *In Vitro Cell Dev Biol Anim.* 47(4):312-7, 2011

Kelly SE, Di Benedetto A, Greco A, Howard CM, Sollars VE, Primerano DA, Valluri JV, Claudio PP. **Rapid selection and proliferation of CD133+ cells from cancer cell lines: chemotherapeutic implications.** *PLoS One;* 5(4):e1003, 2010

Marrero B, Messina JL, Heller R. **Generation of a tumor spheroid in a microgravity environment as a 3D model of melanoma.** *In Vitro Cell Dev Biol Anim.* 45: 523-34, 2009

Vertrees RA, McCarthy M, Solley T, Popov VL, Roaten J, Pauley M, Wen X, Goodwin TJ. **Development of a three-dimensional model of lung cancer using cultured transformed lung cells.** *Cancer Biol Ther* 8:356-365, 2009

Lawrenson K, Benjamin E, Turmaine M, Jacobs I, Gayther S, Dafou D. **In vitro three-dimensional modelling of human ovarian surface epithelial cells.** *Cell Prolif.* 42:385-93, 2009

Grun B, Benjamin E, Sinclair J, Timms JF, Jacobs IJ, Gayther SA, Dafou D. **Three-dimensional in vitro cell biology models of ovarian and endometrial cancer.** *Cell Prolif.* 42:219-28, 2009

Kumari R, Singh KP, Dumond JW Jr. **Simulated microgravity decreases DNA repair capacity and induces DNA damage in human lymphocytes.** *J. Cell Biochem.*107:723-31, 2009

Sung, S-Y, Hsieh, C-L, Law A, Zhau HE, Pathak S, A Multani AS, Lim S, Coleman IM, Wu L-C, Figg WD, Dahut WL, Nelson P, Lee JK, Amin MB, Lyles R, Johnstone PAJ, Marshall FF, Chung LWK. **Coevolution of Prostate Cancer and Bone Stroma in Three-Dimensional Coculture: Implications for Cancer Growth and Metastasis.** *Cancer Res* 68:9996-10003, 2008

Becker JL, Blanchard DK. **Characterization of primary breast carcinomas grown in three-dimensional cultures.** *J Surg Res* 142: 256-262, 2007

Vamvakidou AP, Mondrinos MJ, Petushi SP, Garcia FU, Lelkes PI, Tozeren A. **Heterogeneous breast tumoroids: An in vitro assay for investigating cellular heterogeneity and drug delivery.** *J Biomol Screen* 12:13-20, 2007

Taga M, Yamauchi K, Odle J, Furian L, Sundaresan A, Ramesh GT, Pellis NR, Andrassy RJ, Kulkarni AD. **Melanoma growth and tumorigenicity in models of microgravity.** *Aviat. Space Environ. Med.* 77: 1113-1116, 2006

Vincent L, Avancena P, Cheng J, Rafii S, Rabbany S.: **Simulated Microgravity Impairs Leukemic Cell Survival Through Altering VEGFR-2/VEGF-A Signaling Pathway:** *Annals of Biomedical Engineering,* 33: 1405-1410, 2005

Song H, David O, Clejan S, Giordano CL, Pappas-Lebeau H, Xu, L, O'Connor KC: **Spatial Composition of Prostate Cancer Spheroids in Mixed and Static Cultures.** *Tissue Eng.* 10: 7/8, 1266-1276, 2004.

Laguinge LM, Lin S, Samara RN, Salestiotis AN, Jessup JM. **Nitrosative stress in rotated three-dimensional colorectal carcinoma cell cultures induces microtubule depolymerization and apoptosis.** *Cancer Res.* 64: 2643-2648, 2004

Moon B, Lee YJ, Battle P, Jessup JM, Raz A, Kim HRC: **Galectin-3 Protects Human Breast Carcinoma Cells against Nitric Oxide-Induced Apoptosis: Implication of Galectin-3 Function during Metastasis.** *Amer. Jour. Path.* 159: 1055-1060, 2001.

- Song YK, Billiar TR, Lee YJ: **Role of Galectin-3 in Breast Cancer Metastasis: Involvement of Nitric Oxide.** *Amer. Jour. Path.* 160: 1069-1075, 2002.
- Rhiel MH, Cohen MB, Arnold MA, Murhammer DW: **On-line Monitoring of Human Prostate Cancer Cells in a Perfusion Rotating Wall Vessel by Near-Infrared Spectroscopy.** *Biotechnol Bioeng* 86: 852-861, 2004.
- Green LM, Patel Z, Murray DK, Rightnar S, Burell CG, Gridley DS, Nelson GA: **Cytoskeletal and Functional Changes in Bioreactor Assembled Thyroid Tissue Organoids Exposed to Gamma Radiation.** *J Radiat. Res.* 43 (supplement): S213-S218, 2002.
- Winkenwerder JJ, Palechek PL, Reece JS, Saarinen MA, Arnold MA, Cohen MB, Murhammer DW: **Evaluating Prostate Cancer Cell Culturing Methods: A Comparison of Cell Morphologies and Metabolic Activity.** *Oncol. Rep.* 10: 783-789, 2003.
- Nakamura K, Kuga H, Morisaki T, Baba E, Sato N, Mizumoto K, Sueshi K, Tanaka M, and Katano M: **Simulated Microgravity Culture System for a 3-D Carcinoma Tissue Model** *Biotechniques* 33:1068-1076, 2002.
- Savary C, Graziuti ML, Przepiorka D, Tomasovic SP, McIntyre BW, Woodside DG, Pellis NR, Pierson DL, Rex JH: **Characteristics of Human Dendritic Cells Generated in a Microgravity Analog Culture System** *In Vitro Cell Dev Biol Anim* 37:216-222, 2001.
- Rhee HW, Shau HE, Pathak S, Multani AS, Oennanen S, Visakorpi T, and Chung LWK: **Permanent Phenotypic and Genotypic Changes of Prostate Cancer Cells Cultured In a Three-Dimensional Rotating-Wall Vessel.** *In Vitro Cell Dev Biol Anim* 37: 127-140, 2001.
- Licato LL, Prieto VG, and Grimm EA: **A Novel Preclinical Model of Human Malignant Melanoma Utilizing Bioreactor Rotating-Wall Vessels.** *In Vitro Cell Dev Biol Anim* 37: 121-126, 2001.
- Jessup JM, Frantz M, Sonmez-Alpan E, Locker J, Skena K, Waller H, Battle P, Nachman A, Bhatti, Weber ME, Thomas DA, Curbeam RL, Baker TL, and Goodwin TJ: **Microgravity Culture Reduces Apoptosis and Increases the Differentiation of a Human Colorectal Carcinoma Cell Line,** *In Vitro Cell Dev Biol* 36:367-373, 2000.
- Kaeffer B, Bénard C, Lahaye M, Blotti re HM, Cherbut C: **Biological Properties of Ulvan, a New Source of Green Seaweed Sulfated Polysaccharides, on Cultured Normal and Cancerous Colonic Epithelial Cells.** *Planta Med* 65:6 527-531, 1999.
- O'Connor KC: **Three-Dimensional Cultures of Prostatic Cells: Tissue Models for the Development of Novel Anti-Cancer Therapies.** *Pharmaceutical Research* 16: 486-493, 1999.
- Goodwin TJ, Prewett TL, Spaulding GF, Becker JL: **Three-Dimensional Culture of a Mixed Mullerian Tumor of the Ovary: Expression Of In Vivo Characteristics.** *In Vitro Cell Dev Biol Anim* 33: 366-374, 1997.
- Chopra V, Dinh TV, and Hannigan EV: **Three-Dimensional Endothelial-Tumor Epithelial Cell Interactions in Human Cervical Cancers.** *In Vitro Cell Dev Biol Anim* 33: 432-42, 1997.
- Ingram M, Techy GB, Saroufeem R, Yazan O, Narayan KS, Goodwin TJ and Spaulding GF: **Three-Dimensional Growth Patterns of Various Human Tumor Cell Lines in Simulated Microgravity of a NASA Bioreactor.** *In Vitro Cell Dev Biol Anim* 33: 459-466, 1997.
- Zhau HE, Goodwin TJ, Shi-Ming Chang, Baker TL and Chung LWK: **Establishment of Three-Dimensional Human Prostate Organoid Coculture under Microgravity-Simulated Conditions: Evaluation of Androgen-Induced Growth and PSA Expression.** *In Vitro Cell Dev Bio Anim* 33: 375-380, 1997.
- O'Connor KC, Enmon RM, Dotson RS, Primavera AC and Clejan S: **Characterization of Autocrine Growth Factors, Their Receptors and Extracellular Matrix Present in Three-Dimensional Cultures of DU 145 Prostate Carcinoma Cells Grown in Simulated Microgravity.** *Tissue Engineering* 3: 161- 171 , 1997.
- Jessup JM, Brown D, Fitzgerald W, Ford RD, Nachman A, Goodwin TJ and Spaulding G: **Induction of Carcinoembryonic Antigen Expression in a Three-Dimensional Culture System.** *In Vitro Cell Dev Biol Anim*33:

352-7, 1997.

Becker JL, Papenhausen PR and Widen RH: **Cytogenetic, Morphologic and Oncogene Analysis of a Cell Line Derived from a Heterologous Mixed Mullerian Tumor of the Ovary.** *In Vitro Cell Dev Biol Anim* 33: 325-31, 1997.

Clejan S, O'Conner KC, Cowger NL, Cheles MK, Haque S and Primavera AC: **Effects of Simulated Microgravity on DU 145 Human Prostate Carcinoma Cells.** *Biotechnol Bioeng* 50: 587-597, 1996.

Jessup JM, Goodwin TJ, Spaulding GF: **Prospects for Use of Microgravity-Based Bioreactors to Study Three Dimensional Host-Tumor Interactions in Human Neoplasia.** *J Cell Biochem* 51: 290-300, 1993.

Becker JL, Prewett TL, Spaulding GF, Goodwin TJ: **Three-Dimensional Growth and Differentiation of Ovarian Tumor Cell Line in High Aspect Rotating Wall Vessel. Morphologic and Embryologic Considerations** *J Cell Biochem* 51: 283-289, 1993.

Prewett TL, Goodwin TJ, Spaulding GF: **Three Dimensional Modeling of T-24 Human Bladder Carcinoma Cell Line: A New Simulated Microgravity Vessel.** *J Tissue Culture Methods*. 15: 29-36, 1993.

Goodwin TJ, Jessup JM, Wolf DA: **Morphological Differentiation of Colon Carcinoma Cell Lines HT-29 and HT-29KM in Rotating Wall Vessels.** *In Vitro Cell Div Biol* 28A:1 47-60, 1992.

CARDIOVASCULAR

Novel Bioreactor Platform for Scalable Cardiomyogenic Differentiation from Pluripotent Stem Cell-Derived Embryoid Bodies.

Rungarunlert S, Ferreira JN, Dinnyes A. *Methods Mol Biol*. 2016 Apr 5

Teo A, Mantalaris A, Song K, Lim M **A novel perfused rotary bioreactor for cardiomyogenesis of embryonic stem cells.** *Biotechnol Lett*. 2014 May;36(5):947-60. doi:10.1007/s10529-014-1456-y.

Wang B, Tedder ME, Perez CE, Wang G, de Jongh Curry AL, To F, Elder SH, Williams LN, Simionescu DT, Liao J. **Structural and biomechanical characterizations of porcine myocardial extracellular matrix.** *J Mater Sci Mater Med*. 2012 May 15

Rungarunlert S, Klincumhom N, Bock I, Nemes C, Techakumphu M, Purity MK, Dinnyes A. **Enhanced cardiac differentiation of mouse embryonic stem cells by use of the slow-turning, lateral vessel (STLV) bioreactor.** *Biotechnol Lett*. 2011 Aug;33(8):1565-73, 2011

Consolo F, Bariani C, Mantalaris A, Montevecchi F, Redaelli A, Morbiducci U. **Computational modeling for the optimization of a cardiogenic 3D bioprocess of encapsulated embryonic stem cells.** *Biomech Model Mechanobiol.*, Apr 2011

Kwon O, Tranter M, Jones WK, Sankiovic JM, Banerjee RK. **Differential translocation of nuclear factor-kappaB in a cardiac muscle cell line under gravitational changes.** *J Biomech Eng*. 131:064503, 2009

Lu S, Liu S, He W, Duan C, Li Y, Liu Z, Hao T, Wang Y, Li D, Wang C, Gao S. **Bioreactor Cultivation Enhances NTEB Formation and Differentiation of NTES Cells into Cardiomyocytes.** *Cloning Stem Cells* 10:363-370, 2008

Arrigoni C, Chitto A, Mantero S, Remuzzi A. **Rotating versus perfusion bioreactor for the culture of engineered vascular constructs based on hyaluronic acid.** *Biotechnol Bioeng*. 100: 988-997, 2008

Bruno S, Bussolati B, Scacciatella P, Marra S, Sanavio F, Tarella C, Camussi G. **Combined administration of G-CSF and GM-CSF stimulates monocyte-derived pro-angiogenic cells in patients with acute myocardial infarction.** *Cytokine* 34: 56-65, 2006

Guo XM, Zhao YS, Chang HX, Wang CY, Ling-Ling E, Zhang XA, Duan CM, Dong LZ, Jiang H, Li J, Song Y, Yang XJ. **Creation of engineered cardiac tissue in vitro from mouse embryonic stem cells.** *Circulation* 113:2229-2237, 2006.

Cotrupi S, Ranzani D, Maier JA: **Impact of modeled microgravity on microvascular endothelial cells.** *Biochem Biophys Acta* 1746(2):163-168, 2005.

[Abstract in English, Article in Chinese]

Yang F, Li YH, Nie JL: **[Pilot Study of Neonatal Rat Cardiac Myocytes Cultured for Three-Dimensional Modeling in Simulated Microgravity].** *Zhongguo Xiu Fu Chong Juan Wai Ke Za Zhi* Mar; 18(2):119-122, 2004.

Bursac N, Papadaki M, White JA, Eisenberg SR, Vunjak-Novakovic G, Freed L: **Cultivation in Rotating Bioreactors Promotes Maintenance of Cardiac Myocyte Electrophysiology and Molecular properties.** *Tissue Eng.* Vol. 9, No.6, 1243-1253, 2003.

Van Luyn MA, Tio RA, Gallego y van Seijen XJ, Plantinga JA, de Leij LFMH, DeJongste ML, van Wachem PB: **Cardiac Tissue Engineering: Characteristics of in Unison Contracting Two- and Three-dimensional Neonatal Rat Ventricle Cell (Co)-Cultures.** *Biomaterials* 23: 4793-4801, 2002.

Liu X, Wang CY, Guo XM, OuYang WQ: **Experimental Study of Cardiac Muscle Tissue Engineering in Bioreactor.** *Zhongguo Yi Xue Yuan Xue Bao* Feb., 7-12, 2003. (Article in Chinese, Abstract in English)

Sutherland FW, Perry TE, Nassen BA, Wang J, Kaushal S, Guleserian KJ, Martin DP, Vacanti JP and Mayer JE: **Advances in the Mechanisms of Cell Delivery to Cardiovascular Scaffolds: Comparison of Two Rotating Cell Culture Systems.** *ASAIO J* 48:346-9, 2002.

Papadaki M, Bursac N, Langer R, Merok J, Vunjak-Novakovic G, Freed LE: **Tissue Engineering of Functional Cardiac-Muscle: Molecular, Structural, and Electrophysiological Studies.** *Am J Physiol Heart Physiol* 280:H168-178, 2001.

Lwigale PY, Thurmond JE, Norton WN, Spooner BS, Wiens DJ: **Simulated Microgravity and Hypergravity Attenuate Heart Tissue Development in Explant Culture.** *Cells Tissues Organs* 167: 171-183, 2000.

Carrier RL, Papadaki M, Rupnick M, Schoen F, Bursac N, Langer R, Freed LE, Vunjak-Novakovic G: **Cardiac Tissue Engineering: Cell Seeding, Cultivation Parameters, and Tissue Construct Characterization.** *Biotechnol Bioeng* 64: 580-589, 1999.

Bursac N, Papadaki M, Cohen AJ, Schoen FJ, Eisenberg SR, Carrier R, Vunjak-Novakovic G, Freed LE: **Cardiac Muscle Tissue Engineering: Toward an In Vitro Model for Electrophysiological Studies.** *Am J Physiol* 277: Pt 2 H433-444, 1999.

Akins RE, Schroedl NA, Gonda SR and Hartzell CR: **Neonatal Rat Heart Cells Cultured in Simulated Microgravity.** *In Vitro Cell Dev Biol Anim* 33: 337-343, 1997.

CARTILAGE/CHONDROCYTES

Generating mechanically stable, pediatric, and scaffold-free nasal cartilage constructs in vitro

Akbari P, Waldman SD, Propst E, Cushing SL, Weber JF, Yeger H, Farhat WA. *Tissue Eng Part C Methods*. 2016 Nov 9.

Transfection of the IHH gene into rabbit BMSCs in a simulated microgravity environment promotes chondrogenic differentiation and inhibits cartilage aging.

Liu PC, Liu K1, Liu JF, Xia K, Chen LY, Wu X. *Oncotarget*. 2016 Sep 6;7(39):62873-62885. doi: 10.18632/oncotarget.11871.

Induction of mesenchymal stem cell chondrogenic differentiation and functional cartilage microtissue formation for in vivo cartilage regeneration by cartilage extracellular matrix-derived particles.

Yin H, Wang Y, Sun Z, Sun X, Xu Y, Li P, Meng H, Yu X, Xiao B, Fan T, Wang Y, Xu W, Wang A, Guo Q, Peng J, Lu S. *Acta Biomater.* 2016 Jan 20. pii: S1742-7061(16)30024-1. doi: 10.1016/j.actbio.2016.01.024.

Pediatric laryngotracheal reconstruction with tissue-engineered cartilage in a rabbit model.

Jacobs IN, Redden RA, Goldberg R, Hast M, Salowe R, Mauck RL, Doolin EJ. *Laryngoscope.* 2016 Jan;126 Suppl 1:S5-21. doi: 10.1002/lary.25676.

Kang H, Lu S, Peng J, Yang Q, Liu S, Zhang L, Huang J, Sui X, Zhao B, Wang A, Xu W, Guo Q, Song Q.

Chondrogenic differentiation of human adipose derived stem cells using microcarrier and bioreactor combination technique. *Mol Med Rep.* 2014 Oct 30. doi: 10.3892/mmr.2014.2820.

Optimal 3D culture of primary articular chondrocytes for use in the rotating wall vessel bioreactor.

Mellor LF, Baker TL, Brown RJ, Catlin LW, Oxford JT. *Aviat Space Environ Med.* 2014 Aug;85(8):798-804. doi: 10.3357/ASEM.3905.2014.

Warnock JJ, Fox DB, Stoker AM, Beatty M, Cockrell M, Janicek JC, Cook JL. **Culture of equine fibroblast-like synoviocytes on synthetic tissue scaffolds towards meniscal tissue engineering: a preliminary cell-seeding study.** *PeerJ.* 2014 Apr 17;2:e353. doi: 10.7717/peerj.353. eCollection 2014.

Liu S, Hou KD, Yuan M, Peng J, Zhang L, Sui X, Zhao B, Xu W, Wang A, Lu S, Guo Q. **Characteristics of mesenchymal stem cells derived from Wharton's jelly of human umbilical cord and for fabrication of non-scaffold tissue-engineered cartilage.** *J Biosci Bioeng.* 2013 Jul 27. pii: S1389-1723(13)00263-6. doi: 10.1016/j.jbiosc.2013.07.001.

Wu X, Li SH, Lou LM, Chen ZR. **The effect of the microgravity rotating culture system on the chondrogenic differentiation of bone marrow mesenchymal stem cells.** *Mol Biotechnol.* 2013 Jun;54(2):331-6. doi: 10.1007/s12033-012-9568-x.(1)

Reuther MS, Wong VW, Briggs KK, Chang AA, Nguyen QT, Schumacher BL, Masuda K, Sah RL, Watson D.; **Culture of Human Septal Chondrocytes in a Rotary Bioreactor.** *Otolaryngol Head Neck Surg.* 2012 Oct;147(4):661-7

Takebe T, Kobayashi S, Kan H, Suzuki H, Yabuki Y, Mizuno M, Adegawa T, Yoshioka T, Tanaka J, Maegawa J, Taniguchi H. **Human elastic cartilage engineering from cartilage progenitor cells using rotating wall vessel bioreactor.** *Transplant Proc.* 2012 May;44(4):1158-61.

Rosado H, O'Neill AJ, Blake KL, Walther M, Long PF, Hinds J, Taylor PW. **Rotating wall vessel exposure alters protein secretion and global gene expression in Staphylococcus aureus.** *International Journal of Astrobiology.* 2012 Apr;11(2):71-81. doi: 10.1017/S1473550411000346.

Yu B, Yu D, Cao L, Zhao X, Long T, Liu G, Tang T, Zhu Z. **Simulated microgravity using a rotary cell culture system promotes chondrogenesis of human adipose-derived mesenchymal stem cells via the p38 MAPK pathway.** *Biochem Biophys Res Commun.*;414(2):412-8 Oct 2011

Sheehy EJ, Buckley CT, Kelly DJ., **Chondrocytes and bone marrow-derived mesenchymal stem cells undergoing chondrogenesis in agarose hydrogels of solid and channelled architectures respond differentially to dynamic culture conditions.** *J Tissue Eng Regen Med.* Epub Jan 2011

Cinbiz MN, Tigli RS, Beskardes IG, Gumusderelioglu M, Colak U. **Computational fluid dynamics modeling of momentum transport in rotating wall perfused bioreactor for cartilage tissue engineering.** *J Biotechnol* 150:389-395, 2010

Nikolaev NI, Obradovic B, Versteeg HK, Lemon G, Williams DJ. **A validated model of GAG deposition, cell distribution and growth of tissue engineered cartilage cultured in a rotating bioreactor.** *Biotechnol Bioeng* 105:842-853, 2010

Villanueva I, Klement BJ, Von Deutsch D, Bryant SJ. **Cross-linking density alters early metabolic activities in chondrocytes encapsulated in poly(ethylene glycol) hydrogels and cultured in the rotating wall vessel.** *Biotechnol Bioeng.* 102:1242-50, 2009.

- Li WJ, Jiang YJ, Tuan RS. **Cell-Nanofiber based cartilage tissue engineering using improved cell seeding, growth factor and bioreactor technologies.** *Tissue Engineering: Part A*. 14: 639-48, 2008
- Sakai S, Mishima H, Ishii T, Akaogi H, Yoshioka T, Ohyabu Y, Chang F, Ochiai N, Uemura T. **Rotating three-dimensional dynamic culture of adult human bone marrow-derived cells for tissue engineering of hyaline cartilage.** *J Orthop Res*.27:517-21, 2009.
- Li WJ, Jiang YJ, Tuan RS. **Cell-Nanofiber-Based Cartilage tissue Engineering Using Improved Cell Seeding, Growth Factor, and Bioreactor Technologies.** *Tissue Eng Part A* 14: 639-648, 2008
- Pei M, He F, Kish VL, Vunjak-Novakovic G. **Engineering of Functional Cartilage Tissue Using Stem Cells from Synovial Lining: A Preliminary Study.** *Clin Orthop Relat Res* 466: 1880-1889, 2008
- Emin N, Koc A, Durkut S, Elcin AE, Elcin YM. **Engineering of rat articular cartilage on porous sponges: effects of tgf Beta 1 and microgravity bioreactor culture.** *Artif Cells Blood Substit Immobil Biotechnol* 36: 123-137, 2008
- Pound JC, Green DW, Roach HI, Mann S, Oreffo RO. **An ex vivo model for chondrogenesis and osteogenesis.** *Biomaterials* 28:2839-2849, 2007
- Pound JC, Green DW, Chaudhuri JB, Mann S, Roach HI, Oreffo RO. **Strategies to Promote Chondrogenesis and Osteogenesis from Human Bone Marrow Cells and Articular Chondrocytes Encapsulated in Polysaccharide Templates.** *Tissue Eng* 12:2789-2799, 2006
- Ohyabu Y, Kida N, Kojima H, Taguchi T, Tanaka J, Uemura T. **Cartilaginous tissue formation from bone marrow using rotating wall vessel (RWV) bioreactor.** *Biotechnol. Bioeng.* 95: 1003-1008, 2006
- Marolt D, Augst A, Freed LE, Vepari C, Fajardo R, Patel N, Gray M, Farley M, Kaplan D, Vunjak-Novakovic G. **Bone and cartilage tissue constructs grown using human bone marrow stromal cells, silk scaffolds and rotating bioreactors.** *Biomaterials* 27: 6138-6149, 2006
- Tognana, E., Padera, R.F., Chen, F., Vunjak-Novakovic, G., Freed, L.E): **Development and remodeling of engineered cartilage-explant composites in vitro and in vivo.** *Osteoarthritis and Cartilage* 13: 896-905, 2005
- Tognana, E., Chen, F., Padera, R.F., Leddy, H.A, Christensen, S.E., Guilak, F., Vunjak-Novakovic, G., Freed, L.E: **Adjacent Tissue (Cartilage, Bone) Affect the Functional Integration of Engineered Calf Cartilage in vitro.** *Osteoarthritis and Cartilage* 13: 129-138, 2005
- Hu JC, Athanasiou KA: **Low-density Cultures of Bovine Chondrocytes: Effects of Scaffold Material and Culture System.** *Biomaterials* 26:2001-2012, 2005.
- Marlovits S, Tichy B, Truppe M, Gruber D, Vecsei V. **Chondrogenesis of Aged Human Articular Cartilage in a Scaffold-Free Bioreactor.** *Tissue Eng.* 9: 1215-1226, 2003.
- Marlovits S, Tichy B, Truppe M, Gruber D, Schlegel W. **Collagen Expression in Tissue Engineered Cartilage of Aged Human Articular Chondrocytes in a Rotating Bioreactor:** *Int. Jour. Artificial Organs* 26: 319-330, 2003.
- Darling EM, Athanasiou KA: **Articular Cartilage Bioreactors and Bioprocesses.** *Tissue Eng.* 9: 9-26, 2003.
- Pei M, Solchaga LA, Seidel J, Zenf L. Vunjak-Novakovic G, Caplan AI, Freed LE. **Bioreactors Mediate the Effectiveness of Tissue Engineering Scaffolds:** *FASEB J* 16:1691-4, 2002.
- Pei M, .Seidel J, G.Vunjak-Novakovic,and.Freed L.E. **Growth factors for sequential cellular de-and re-differentiation in tissue engineering:** *Biochem Biophys Res Commun* 294, 149-154, 2002
- Vunjak-Novakovic G, Obradovic B, Martin I, Freed LE: **Bioreactor Studies of Native and Tissue Engineered Cartilage.** *Biorheology* 39:259-268, 2002.

- Koch RJ, Gorti GK: **Tissue Engineering with Chondrocytes**, *Facial Plast Surg* 18:59-68, 2002.
- Gooch KJ, Blunk T, Courter DL, Sieminski AL, Bursac PM, Vunjak-Novakovic G and Freed LE: **IGF-I and Mechanical Environment Interact to Modulate Engineered Cartilage Development**. *Biochem Biophys Res Commun* 286: 909-15, 2001.
- Martin I, Obradovic B, Treppo S, Grodzinsky AJ, Langer R, Freed LE, and Vunjak-Novakovic G: **Modulation of The Mechanical Properties of Tissue Engineered Cartilage**. *Biorheology* 37:141-7, 2000.
- Falsafi S and Koch RJ: **Growth of Tissue-Engineered Human Nasoseptal Cartilage in Simulated Microgravity**. *Arch Otolaryngol Head Neck Surg* 126:759-765, 2000.
- Vunjak-Novakovic G, Martin I, Obradovic B, Treppo S, Grodzinsky AJ, Langer R, and Freed L: **Bioreactor Cultivation Conditions Modulate the Composition and Mechanical Properties of Tissue-Engineered Cartilage**. *J Orthop Res* 17: 130-138, 1999.
- Obradovic B, Carrier R, Vunjak-Novakovic G and Freed LE: **Gas Exchange is Essential for Bioreactor Cultivation of Tissue Engineered Cartilage**. *Biotechnol Bioeng* 63: 197-205, 1999.
- Freed L, Martin I and Vunjak-Novakovic G: **Frontiers in Tissue Engineering –In Vitro Modulation of Chondrogenesis**. *Clinical Orthopedics and Related Research* 367S:S46-S58, 1999.
- Freed L. *et al*: **Chondrogenesis in a Cell-Polymer Bioreactor system**. *Exp Cell Res* 240: 58-65, 1998.
- Riesle J, Hollander AP, Langer R, Freed LE, and Vunjak-Novakovic G: **Collagen in Tissue-Engineered Cartilage: Types Structure, and Crosslinks**. *J Cell Biochem* 71: 313-27, 1998.
- Baker TL and Goodwin TJ: **Three Dimensional Culture of Bovine Chondrocytes in Rotating-Wall Vessels**. *In vitro Cell Dev Biol Anim* 33: 358-365, 1997.
- Duke PJ, Daane E, Arizpe J and Montufar-Solis D: **Chondrogenesis in Aggregates of Embryonic Limb Cells Grown in a Rotating Wall Vessel**. *Adv. Space Research* 17: 289-293, 1996.
- Duke PJ, Daane EL, Montufar-Solis D: **Studies of Chondrogenesis in Rotating Systems** *J Cell Biochem* 51: 274-282, 1993.
- Freed LE, Vunjak-Novakovic G and Langer R: **Cultivation of Cell-Polymer Cartilage Implants in Bioreactors**. *J Cell Biochem* 51: 257-64, 1993.

FLUID MECHANICAL PRINCIPLES OF RCCS

- Song K, Wang H, Zhang B, Lim M, Liu Y, Liu T; **Numerical simulation of fluid field and in vitro three-dimensional fabrication of tissue-engineered bones in a rotating bioreactor and in vivo implantation for repairing segmental bone defects**. *Cell Stress Chaperones*. 2012 Oct 5. [Epub ahead of print]
- Consolo F, Bariani C, Mantalaris A, Montevecchi F, Redaelli A, Morbiducci U. **Computational modeling for the optimization of a cardiogenic 3D bioprocess of encapsulated embryonic stem cells**. *Biomech Model Mechanobiol.*, Apr 2011
- Cinbiz MN, Tigli RS, Beskardes IG, Gumusdereliogiu M, Colak U. **Computational fluid dynamics modeling of momentum transport in rotating wall perfused bioreactor for cartilage tissue engineering**. *J Biotechnol* 150:389-395, 2010
- Cummings LJ, Sawyer NB, Morgan SP, Rose FR, Waters SL. **Tracking large solid constructs suspended in a rotating bioreactor: A combined experimental and theoretical study**. *Biotechnol Bioeng* 104:1224-1234, 2009

Gutierrez RA, Crumpler ET. **Potential Effect of Geometry on Wall Shear Stress Distribution Across Scaffold Surfaces.** *Ann Biomed Eng.* 36: 77-85, 2008

Cummings LJ, Waters SL. **Tissue growth in a rotating bioreactor. Part II: fluid flow and nutrient transport problems.** *Math Med Biol* 24: 169-208, 2007

Rivera-Solorio I, Kleis SJ: **Model of the mass transport to the surface of animal cells cultured in a rotating bioreactor operated in micro gravity.** *Biotechnol Bioeng.* 94: 495-504, 2006.

Ju Z, Liu T, Ma X, Cui Z. **Numerical simulation of microcarrier motion in a rotating wall vessel bioreactor.** *Biomed Environ Sci* 19: 163-168, 2006

Lappa, M. **Fluids, Materials, and Microgravity: Numerical Techniques and Insights into the Physics.** Naples, Italy: Elsevier Science Oxford, 2004.

Botchwey EA, Pollack SR, Levine EM, Johnston ED, Leurencin CT: **Quantitative Analysis of Three-Dimensional Fluid Flow in Rotating Bioreactors for Tissue Engineering.** *J Biomed Mater Res* 69: 205-215, 2004.

Lappa M: **Organic Tissues in Rotating Bioreactors: Fluid-Mechanical Aspects, Dynamic Growth Models, and Morphological Evolutions.** *Biotechnol Bioeng.* 84: 518-532, 2003.

Hammond TG, and Hammond JM: **Optimized Suspension Culture: The Rotating-Wall Vessel.** *Am J Physiol Renal Physiol* 281: F12-F25, 2001.

HEMATOPOIETIC SYSTEM

A Study of Alterations in DNA Epigenetic Modifications (5mC and 5hmC) and Gene Expression Influenced by Simulated Microgravity in Human Lymphoblastoid Cells.

Chowdhury B, Seetharam A, Wang Z, Liu Y, Lossie AC, Thimmapuram J, Irudayaraj J. *PLoS One.* 2016 Jan 28;11(1):e0147514. doi: 10.1371/journal.pone.0147514. eCollection 2016.

Integrated Biophysical and Biochemical Signals Augment Megakaryopoiesis and Thrombopoiesis in a Three-Dimensional Rotary Culture System.

Yang Y, Liu C, Lei X, Wang H, Su P, Ru Y, Ruan X, Duan E, Feng S, Han M, Xu Y, Shi L, Jiang E, Zhou J. *Stem Cells Transl Med.* 2015 Dec 23. pii: sctm.2015-0080

Wei L, Liu C, Kang L, Liu Y, Shi S, Wu Q, Li Y. **Experimental study on effect of simulated microgravity on structural chromosome instability of human peripheral blood lymphocytes.** *PLoS One.* 2014 Jun 25;9(6):e100595. doi: 10.1371/journal.pone.0100595. eCollection 2014.

Girardi C, De Pittà C, Casara S, Calura E, Romualdi C, Celotti L, Mognato M. **Integration Analysis of MicroRNA and mRNA Expression Profiles in Human Peripheral Blood Lymphocytes Cultured in Modeled Microgravity.** *Biomed Res Int.* 2014;2014:296747. doi: 10.1155/2014/296747

Fauzi I, Panoskaltzis N, Mantalaris A. **Early exposure of murine embryonic stem cells to hematopoietic cytokines differentially directs definitive erythropoiesis and cardiomyogenesis in alginate hydrogel three-dimensional cultures.** *Stem Cells Dev.* 2014 Jun 13. (Epub ahead of print)

Sambandam Y, Townsend MT, Pierce JJ, Lipman CM1, Haque A, Bateman TA, Reddy SV. **Microgravity control of autophagy modulates osteoclastogenesis.** *Bone.* 2014 Jan 23. pii: S8756-3282(14)00006-4. doi: 10.1016/j.bone.2014.01.004.

Yang Y, Zhang E, Li W, Mi X, Meng Y, Yan S, Wang Z, Wei W, Shao C, Xing R, Lin C, Dang B. **Simulated microgravity increases heavy ion radiation-induced apoptosis in human B lymphoblasts.** *Life Sci.* 2013 Dec 21. pii: S0024-3205(13)00755-8. doi:10.1016/j.lfs.2013.12.008

Wang C, Luo H, Zhu L, Yang F, Chu Z, Tian H, Feng M, Zhao Y, Shang P. **Microgravity inhibition of lipopolysaccharide-induced tumor necrosis factor- α expression in macrophage cells.** *Inflamm Res.* 2014 Jan;63(1):91-8. doi: 10.1007/s00011-013-0676-2

Yuan Y, Sin WY, Xue B, Ke Y, Tse KT, Chen Z, Xie Y, Xie Y. **Novel alginate three-dimensional static and rotating culture systems for effective ex vivo amplification of human cord blood hematopoietic stem cells and in vivo functional analysis of amplified cells in NOD/SCID mice.** *Transfusion.* 2013 Feb 5. doi: 10.1111/trf.12103.

Hao T, Li JJ, DU ZY, Duan CM, Wang YM, Wang CY, Song JP, Wang LJ, Li YH, Wang Y.; **Cordyceps Sinensis Enhances Lymphocyte Proliferation and CD Markers Expression in Simulated Microgravity Environment.** *Zhongguo Shi Yan Xue Ye Xue Za Zhi.* 2012 Oct;20(5):1212-5. (Abstract in English; Article in Chinese)

Puca A, Russo G, Giordano A. **Properties of mechano-transduction via simulated microgravity and its effects on intracellular trafficking of VEGFR's.** *Oncotarget.* 2012 Apr;3(4):426-34.

Hao T, Wang YM, Li JJ, Du ZY, Duan CM, Wang CY, Song JP, Wang LJ, Li YH, Wang Y. **Effect of lentinan against immunosuppression of lymphocytes cultured in simulated microgravity environment.** *Zhongguo Shi Yan Xue Ye Xue Za Zhi.* 2012 Feb;20(1):182-6. (Abstract in English, Article in Chinese)

Girardi C, De Pittà C, Casara S, Sales G, Lanfranchi G, Celotti L, Mognato M. **Analysis of miRNA and mRNA expression profiles highlights alterations in ionizing radiation response of human lymphocytes under modeled microgravity.** *PLoS One.* 2012;7(2):e31293.

Crabbé A, Sarker SF, Van Houdt R, Ott CM, Leys N, Cornelis P, Nickerson CA. **Alveolar epithelium protects macrophages from quorum sensing-induced cytotoxicity in a three-dimensional co-culture model.** *Cell Microbiol.* 2011 Mar;13(3):469-81. doi: 10.1111/j.1462-5822.2010.01548.x.

Sheehy EJ, Buckley CT, Kelly DJ., **Chondrocytes and bone marrow-derived mesenchymal stem cells undergoing chondrogenesis in agarose hydrogels of solid and channelled architectures respond differentially to dynamic culture conditions.** *J Tissue Eng Regen Med.* Epub Jan 2011

Kedong S, Xiubo F, Tianqing L, Macedo HM, LiLi J, Meiyun F, Fangxin S, Xuehu M, Zhanfeng C, **Simultaneous expansion and harvest of hematopoietic stem cells and mesenchymal stem cells derived from umbilical cord blood.** *J Mater Sci Mater Med.* 21(12):3183-93, 2010

Song K, Fan X, Liu T, Macedo HM, Jiang L, Fang M, Shi F, Ma X, Cui Z. **Simultaneous expansion harvest of hemotopoietic stem cells and mesenchymal stem cells derived from umbilical cord blood.** *J Mater Sci Mater Med* 21:3183-3193, 2010

Singh KP, Kumari R, Dumond JW. **Simulated microgravity-induced epigenetic changes in human lymphocytes.** *J Cell Biochem* 111:123-129, 2010

Nichols JE, Cortiella J, Lee J, Niles J, Cuddihy M, Wang S, Cantu A, Mlcak R, Valdiva E, Yancy R, Bielitzki J, McClure ML, Kotev NA. **In vitro analog of human bone marrow from 3D scaffolds with biomimetic inverted colloidal crystal geometry.** *Biomaterials* 30: 1071-1079, 2009

Sundaresan A, Pellis NR. **Cellular and genetic adaptation in low-gravity environments.** *Ann N Y Acad Sci.* 1161:135-46, 2009

Li X, Liu CT, Zhou H. **The influence of leptin on the activity of lung lymphocytes under simulated microgravity.** *Eur J App Physiol.* 107: 335-44, 2009

Simmons DM, Gardner EM, Lelkes PI. **Sub-mitogenic phorbol myristate acetate co-stimulation rescues the PHA-induced activation of both naïve and memory T cells cultured in the rotating-wall vessel bioreactor.** *Cell Biol Intl.* 33:882-6, 2009

Kumari R, Singh KP, Dumond JW Jr. **Simulated microgravity decreases DNA repair capacity and induces DNA damage in human lymphocytes.** *J. Cell Biochem.*107:723-31, 2009

Ward NE, Pellis NR, Risin SA, Risin D. **Gene expression alterations in activated human T-cells induced by modeled microgravity.** *J. Cell. Biochem.* 99: 1187-1202, 2006

Simons DM, Gardner EM, Lelkes PI: **Dynamic culture in a rotating-wall vessel bioreactor differentially inhibits murine T-lymphocyte activation by mitogenic stimuli upon return to static conditions in a time-dependent manner.** *J Appl Physiol* 100: 1287-1292, 2006.

Ritz BW, Lelkes PI, Gardner EM: **Functional recovery of peripheral blood mononuclear cells in modeled microgravity.** *FASEB J.* 20: 305-307, 2006.

Plett PA, Abonour R, Frankovitz SM, Orschell CM: **Impact of Modeled Microgravity on Migration, Differentiation, and Cell Cycle Control of Primitive Human Hematopoietic Progenitor Cells.** *Experimental Hematology* 32: 773-781, 2004.

Bakos A, Varkonyi A, Minarovits J, Batkai L: **Effect of Simulated Microgravity on the Production of IL-12 by PBMC's.** *J Gravit Physiol.* 9: 293-294, 2002.

Kaeffer B, Trubuil A, Kervrann C, Pardini L, Cherbut C: **Three-Dimensional Binding of Epidermal Growth Factor Peptides in Colonic Tissues Produced From Rotating Bioreactor.** *In Vitro Cell Dev Biol Anim* 38: 436-439, 2002.

Plett PA, Frankovitz SM, Abonour R, Orschell-Traycoff CM: **Proliferation of Human Hematopoietic Bone Marrow Cells in Simulated Microgravity.** *In Vitro Cell Dev Biol Anim* 37: 73-78, 2001.

Sytkowski AJ and Davis KL: **Erythroid Cell Growth and Differentiation In Vitro in the Simulated Microgravity Environment of the NASA Rotating Wall Vessel Bioreactor.** *In Vitro Cell Dev Biol Anim* 37: 79-83, 2001.

Hughes JH and Long JP: **Simulated Microgravity Impairs Respiratory Burst Activity in Human Promyelocytic Cells.** *In Vitro Cell Dev Biol Anim* 37: 209-215, 2001.

Licato LL, Grimm EA: **Multiple Interleukin-2 Signaling Pathways Differentially Regulated by Microgravity.** *Immunopharmacology* 44: 273-9, 1999.

INSECT

Joosten CE, Shuler ML: **Effect of Culture Conditions on the Degree of Sialylation of a Recombinant Glycoprotein Expressed in Insect Cells.** *Biotechnol. Prog.* 19: 739-749, 2003.

Saarinen MA and Murhammer DW: **Culture in the Rotating-Wall Vessel Affects Recombinant Protein Production Capability of Two Insect Cell Lines in Different Manners.** *In Vitro Cell Dev Biol Anim* 36: 362-366, 2000.

Park JH, Lee JM, Park IS: **Production of Recombinant Endostatin from Stably Transformed *Drosophila melanogaster* S2 Cells.** *Biotechnology Letters* 21: 729-733, 1999.

Cowger NL, O'Connor KC, Hammond TG, Lacks DJ, Navar GL: **Characterization of Bimodal Cell Death of Insect Cells in a Rotating-Wall Vessel and Shaker Flask.** *Biotechnol Bioeng*, 64:14-26, 1999.

Francis KM, O'Connor KC and Spaulding GF: **Cultivation of Fall Armyworm Ovary Cells in Simulated Microgravity.** *In Vitro Cell Dev Bio Anim* 33: 332-6, 1997.

Cowger NL, O'Connor KC, Bivins JE: **Influence of Simulated Microgravity on the Longevity of Insect-Cell Culture.** *Enzyme and Microbial Technology* 20: 326-332, 1997.

LIVER/PANCREAS

Hetero-cellular prototyping by synchronized multi-material bioprinting for rotary cell culture system.

Snyder JI, Son AR, Hamid Q, Wu H, Sun W. *Biofabrication*. 2016 Jan 13;8(1):015002.

Microgravity as a means to incorporate HepG2 aggregates in polysaccharide-protein hybrid scaffold.

Sarika PR, James NR, Anilkumar PR, Raj DK, Kumary TV. *J Mater Sci Mater Med*. 2016 Feb;27(2):27. doi: 10.1007/s10856-015-5638-5.

Liver-Tumor Hybrid Organoids for Modeling Tumor Growth and Drug Response In Vitro.

Skardal A, Devarasetty M, Rodman C, Atala A, Soker S. *AnnBiomed Eng*. 2015 Mar 17. doi: 10.1007/s10439-015-1298-3

Chen R, Dong Y, Xie X, Chen J, Gao D, Liu Y, Ren Z, Cui J. Screening candidate metastasis-associated genes in three-dimensional HCC spheroids with different metastasis potential. Int J Clin Exp Pathol. 2014 Apr 15;7(5):2527-35. eCollection 2014.

Chen RX, Song HY, Dong YY, Hu C, Zheng QD, Xue TC, Liu XH, Zhang Y, Chen J, Ren ZG, Liu YK, Cui JF. **Dynamic expression patterns of differential proteins during early invasion of hepatocellular carcinoma.** *PLoS One*. 2014 Mar 10;9(3):e88543. doi: 10.1371/journal.pone.0088543. eCollection 2014.

Chang TT, Hughes-Fulford M. Molecular mechanisms underlying the enhanced functions of three-dimensional hepatocyte aggregates. Biomaterials. 2014 Feb;35(7):2162-71. doi: 10.1016/j.biomaterials.2013.11.063.

Oberhuber R, Mittermair C, Zelger B, Pirkebner D, Draxl A, Weissenbacher A, Resch T, Margreiter C, Sucher R, Margreiter R, Pratschke J, Hengster P, Hermann M. **Rotational Transport of Islets: The Best Way for Islets to Get around?** *Biomed Res Int*. 2013;2013:975608. doi: 10.1155/2013/975608.

Tai J, Cheung SS, Ou D, Warnock GL, Hasman D. **Antiproliferation activity of Devil's club (Oplopanax horridus) and anticancer agents on human pancreatic cancer multicellular spheroids.** *Phytomedicine*. 2013 Nov 8. pii: S0944-7113(13)00401-7. doi: 10.1016/j.phymed.2013.10.003.

Song Y, Wei Z, Song C, Xie S, Feng J, Fan J, Zhang Z, Shi Y. **Simulated microgravity combined with polyglycolic acid scaffold culture conditions improves the function of pancreatic islets.** *Biomed Res Int*. 2013;2013:150739. doi: 10.1155/2013/150739.

Tanaka H, Tanaka S, Sekine K, Kita S, Okamura A, Takebe T, Zheng YW, Ueno Y, Tanaka J, Taniguchi H. **The generation of pancreatic β -cell spheroids in a simulated microgravity culture system.** *Biomaterials*. 2013 Jul;34(23):5785-91. doi: 10.1016/j.biomaterials.2013.04.003. Epub 2013 May 2.

Gabriel E, Schievenbusch S, Kolossov E, Hengstler JG, Rotshteyn T, Bohlen H, Nierhoff D, Hescheler J, Drobinskaya I. **Differentiation and selection of hepatocyte precursors in suspension spheroid culture of transgenic murine embryonic stem cells.** *PLoS One*. 2012;7(9):e44912. doi: 10.1371/journal.pone.0044912.

Wang Y, Zhang Y, Zhang S, Peng G, Liu T, Li Y, Xiang D, Wassler MJ, Shelat HS, Geng Y. **Rotating microgravity-bioreactor cultivation enhances the hepatic differentiation of mouse embryonic stem cells on biodegradable polymer scaffolds.** *Tissue Eng Part A*. 2012 Sep 24. (epublication ahead of print)

Ishikawa M, Sekine K, Okamura A, Zheng YW, Ueno Y, Koike N, Tanaka J, Taniguchi H. **Reconstitution of hepatic tissue architectures from fetal liver cells obtained from a three-dimensional culture with a rotating wall vessel bioreactor.** *J Biosci Bioeng*. 111(6):711-8. June 2011

Rotational co-culture of clonal β -cells with endothelial cells: effect of PPAR- γ agonism in vitro on insulin and VEGF secretion.

Paget MB1, Murray HE, Bailey CJ, Flatt PR, Downing R. *Diabetes Obes Metab*. 2011 Jul;13(7):662-8. doi: 10.1111/j.1463-1326.2011.01392.x.

Kammer NN, Billecke N, Morgul MH, Adonopoulou MK, Mogl M, Huang MD, Florek S, Schmitt KR, Raschok N, Sauer IM. **Labeling of primary human hepatocytes with micron-sized iron oxide particles in suspension culture suitable for large-scale preparation.** *Artif Organs.*;35(4):E91-100. doi: 10.1111/j.1525-1594.2010.01177.x, Apr 2011

Nelson LJ, Walker SW, Hayes PC, Plevris JN. **Low-shear modeled microgravity environment maintains morphology and differentiated functionality of primary porcine hepatocyte cultures.** *Cells Tissues Organs* 192:125-140, 2010

Zhang Z, Zhou HC, Li ZG, Pan MX, Wang Z, Gao Y. **Microgravity culture of hepatocytes on cellulose/gelatin macroporous microcarrier.** *Nan Fang Yi Ke Da Xue Xue Bao.* 30:704-, 2010

Sainz B Jr, TenCate V, Uprichard SL. **Three-dimensional Huh7 cell culture system for the study of Hepatitis C virus infection.** *Virology* 6:103, 2009

Han X, Qui L, Zhang Y, Kong Q, Wang H, Wang H, Li H, DUan C, Wang Y, Song Y, Wang C. **Transplantation of sertoli-islet cell aggregates formed by microgravity: prolonged survival in diabetic rats.** *Exp Biol Med (Maywood).* 234:595-603, 2009

Okamura A, Zheng YW, Hirochika R, Tanaka J, Taniguchi H. **In-vitro reconstitution of hepatic tissue architecture with neonatal mouse liver cells using three –dimensional culture.** *J Nanosci Nanotechnol* 7: 721-725, 2007

Clement JQ, Lacy SM, Wilson BL. **Genome-wide gene expression profiling of microgravity effect on human liver cells.** *J Gravit Physiol* 14: P121-122, 2007

Stepkowski SM, Phan T, Zhang H, Bilinski S, Kloc M, Qi Y, Katz SM, Rutzky LP. **Immature syngeneic dendritic cells potentiate tolerance to pancreatic islet allografts depleted of donor dendritic cells in microgravity culture condition.** *Transplantation* 82:1756-1763, 2006

Murray H.E., Padgett, M.B, Downing, R.: **Preservation of glucose responsiveness in human islets maintained in a rotational cell culture system.** *Molecular and Cellular Endocrinology* 238: 39-49, 2005

Coward SM, Selden C, Mantalaris A, Hodgson HJ: **Proliferation Rates of HepG2 Cells Encapsulated in Alginate Are Increased in a Microgravity Environment Compared With Static Cultures.** *Artif Organs* 29: 152-158, 2005.

Song C, Duan XQ, Li X, Han LO, Xu P, Song CF, Jin LH: **Experimental Study on Islet Cells in Rats Under Condition of Three-dimensional Microgravity.** *Zhonghua Wai Ke Za Zhi* 42: 559-561, 2004.

[Abstract in English, Article in Chinese]

Zhang SQ, Gao SJ, Jiang QY, Lao QL, Feng DY: **[Selection of Scaffolds of Rat Hepatocytes in Three-dimensional Culture Under Simulated Microgravity].** *Shi Yan Sheng Wu Xue Bao* 37: 67-71, 2004.

Song C, Duan XQ, Li X, Han LO, Xu P, Song CF, Jin LH: **Experimental Study of Rat Beta Islet Cells Cultured under Simulated Microgravity Conditions.** *Acta Biochim Biophys (Shanghai)* 36: 47-50, 2004.

Rutzky L, Bilinzki Z, Kloc M, Phan T, Zhang H, Katz S, Stepkowski S: **Microgravity Culture Conditions Reduces Immunogenicity And Improves Function Of Pancreatic Islets.** *Transplantation* 74: 13-21, 2002

Brown LA, Arterburn LM, Miller AP, Cowger NL, Hartley SM, Andrews A, Silber PM, Li AP: **Maintenance of Liver Functions in Rat Hepatocytes Cultured as Spheroids in a Rotating Wall Vessel.** *In Vitro Cell Dev Biol Anim Jan*; 39: 13-20,2003.

Cameron DF, Hushen JJ, Dejarlais T, Colado L, Wolski KM, Sanberg PR, Saporta S: **A Unique Cytoplasmic Marker for Extratesticular Sertoli Cells,** *Cell Transplant* 11: 507-512, 2002.

Cameron DF, Hushen JJ, and Nazian SJ, **Formation of Insulin-Secreting, Sertoli-Enriched Tissue Constructs by Microgravity Cocultures of Isolated Pig Islets and Rat Sertoli cells**, *In Vitro Cell Dev Biol Anim* 37:490-498, 2001.

Tobin BW, Leeper-Woodford SK, Hashemi BB, Smith SM, and Sams CF, **Altered TNF-Alpha, Glucose, Insulin, and Amino Acids in Islets of Langerhans Cultured in a Microgravity Model System**, *Am J Physiol Endocrinol Metab* 280:E92-102, 2001

Khaoustov VI, Risin D, Pellis NR, Yoffe B.: **Microarray Analysis of Genes Differentially Expressed in HEPG2 Cells Cultured in Simulated Microgravity: Preliminary Report**. *In Vitro Cell Dev Biol Anim* 37: 84-8, 2001.

Rutzky L, Kloc M, Bilinski S, Phan T, Zhang H, Stepkowski SM, Katz S.: **Microgravity Culture Conditions Decrease Immunogenicity but Maintain Excellent Morphology of Pancreatic Islets**. *Transplant Proc* 33: 388, 2001.

Dabos KJ, Nelson LJ, Bradnock TJ, Parkinson JA, Sadler IH, Hayes PC, Plevris JN: **The Simulated Microgravity Environment Maintains Key Metabolic Functions and Promotes Aggregation of Primary Porcine Hepatocytes**. *Biochem Biophys Acta* 1526: 119-130, 2001.

Yoffe B, Darlington GJ, Soriano HE, Krishnan B, Risin D, Pellis NR, Khaoustov VI: **Cultures of Human Liver Cells in Simulated Microgravity Environment**. *Adv Space Res* 24: 829-836, 1999.

Mitteregger R, Vogt G, Rossmann E, Falkenhagen D., **Rotary Cell Culture System (RCCS): A New Method for Cultivation Hepatocytes on Microcarriers**. *Int J Artif Organs* 22: 12 816-12822, 1999.

Rose MI, Brown DC, Pellis NR, Crisera CA, Colen KL, Longaker MT, Gottes GK: **Effects of Microgravity on the Embryonic Pancreas**. *In Vitro Cell Dev Biol Anim* 35: 560-563, 1999

Battle T, Maguire T, Moulds H, Doyle A., **Progressive Maturation Resistance to Microcystin-LR Cytotoxicity in Two Different Hepatospheroidal Models**. *Cell Biol Toxicol* 15: 3-12, 1999.

Khaoustov VI, Darlington GJ, Soriano HE, Krishnan B, Risin D, Pellis NR, Yoffe B: **Induction of Three-Dimensional Assembly of Human Liver Cells by Simulated Microgravity**. *In Vitro Cell Dev Biol Animal*, 35: 501-509. 1999.

MICROBIOLOGY

Human three-dimensional endometrial epithelial cell model to study host interactions with vaginal bacteria and Neisseria gonorrhoeae.

Łaniewski P, Gomez A, Hire G, So M, Herbst-Kralovetz MM. *Infect Immun*. 2017 Jan 4. pii: IAI.01049-16. doi: 10.1128/IAI.01049-16.

Effect of Shear Stress on Pseudomonas aeruginosa Isolated from the Cystic Fibrosis Lung.

Dingemans J, Monsieurs P, Yu SH, Crabbé A, Förstner KU, Malfroot A, Cornelis P, Van Houdt R. *MBio*. 2016 Aug 2;7(4). pii: e00813-16. doi: 10.1128/mBio.00813-16.

Microgravity as a biological tool to examine host-pathogen interactions and to guide development of therapeutics and preventatives that target pathogenic bacteria.

Higginson EE, Galen JE, Levine MM, Tennant SM. *Pathog Dis*. 2016 Sep 13. pii: ftw095.

IL-36 γ Augments Host Defense and Immune Responses in Human Female Reproductive Tract Epithelial Cells

Sean M. Winkle, Andrea L. Throop and Melissa M. Herbst-Kralovetz. *Front. Microbiol.*, 17 June 2016
<http://dx.doi.org/10.3389/fmicb.2016.00955>

The International Space Station: an Extreme Environment for Key Host-Microbe Discoveries

C. Mark Ott, Thomas Marshburn, and Cheryl A. Nickerson. *Microbe—Volume 11, Number 6, 2016, Pages 253-261.*

Physiological fluid shear alters the virulence potential of invasive multidrug-resistant non-typhoidal *Salmonella Typhimurium* D23580

Jiseon Yang, Jennifer Barrila, Kenneth L Roland, C Mark Ott and Cheryl A Nickerson. *npj Microgravity* 2, Article number: 16021 (2016) doi:10.1038/npjmgrav.2016.21

Increased biofilm formation ability in *Klebsiella pneumoniae* after short-term exposure to a simulated microgravity environment.

Wang H, Yan Y, Rong D, Wang J, Wang H, Liu Z, Wang J, Yang R, Han Y. *Microbiologyopen*. 2016 May 16. doi: 10.1002/mbo3.370.

A three-dimensional culture system recapitulates placental syncytiotrophoblast development and microbial resistance.

McConkey CA1, Delorme-Axford E, Nickerson CA, Kim KS, Sadovsky Y, Boyle JP, Coyne CB. *Sci Adv*. 2016 Mar 4;2(3):e1501462. doi: 10.1126/sciadv.1501462. eCollection 2016.

Influence of Low-Shear Modeled Microgravity on Heat Resistance, Membrane Fatty Acid Composition, and Heat Stress-Related Gene Expression in *Escherichia coli* O157:H7 ATCC 35150, 43889, 43890, and 43895.

Kim HW, Rhee MS. *Appl Environ Microbiol*. 2016 Mar 4. pii: AEM.00050-16. *Appl Environ Microbiol*. 2016 Mar 4. pii: AEM.00050-16.

High throughput de novo RNA sequencing elucidates novel responses in *Penicillium chrysogenum* under microgravity.

Sathishkumar Y, Krishnaraj C, Rajagopal K, Sen D., Lee YS. *Bioprocess Biosyst Eng*. 2015 Nov 24.

Effect of Microgravity on Fungistatic Activity of an α -Aminophosphonate Chitosan Derivative against *Aspergillus niger*

K.Devarayan , Y. Sathishkumar , Y.Soo Lee , B.-Suhk Kim, Published: October 15, 2015
<http://dx.doi.org/10.1371/journal.pone.0139303>

From Single Cells to Engineered and Explanted Tissues: New Perspectives in Bacterial Infection Biology.

Bergmann S, Steinert M. *Int Rev Cell Mol Biol*. 2015;319:1-44. doi: 10.1016/bs.ircmb.2015.06.003. Epub 2015 Jul 21.

Simulated microgravity affects ciprofloxacin susceptibility and expression of *acrAB-tolC* genes in *E. coli* ATCC25922.

Xu B, Li C, Zheng Y, Si S, Shi Y, Huang Y, Zhang J, Cui Y, Cui Y. *Int J Clin Exp Pathol*. 2015 Jul 1;8(7):7945-52. eCollection 2015.

Bacteria in the vaginal microbiome alter the innate immune response and barrier properties of the human vaginal epithelia in a species-specific manner.

Doerflinger SY1, Throop AL2, Herbst-Kralovetz MM2. *J Infect Dis*. 2014 Jun 15;209(12):1989-99. doi: 10.1093/infdis/jiu004. Epub 2014 Jan 7.

Soni A, O'Sullivan L, Quick LN, Ott C, Nickerson CA, Wilson JW. **Conservation of the Low-shear Modeled Microgravity Response in Enterobacteriaceae and Analysis of the *trp* Genes in this Response.** *Open Microbiol J*. 2014 Jun 13;8:51-8. doi: 10.2174/1874285801408010051.

David J, Sayer NM, Sarkar-Tyson M. **The use of a three-dimensional cell culture model to investigate host-pathogen interactions of *Francisella tularensis* in human lung epithelial cells.** *Microbes Infect*. 2014 May 4. pii: S1286-4579(14)00053-7. doi: 10.1016/j.micinf.2014.04.001.

Mastroleo F, Van Houdt R, Atkinson S, Mergeay M, Hendrickx L, Wattiez R, Leys N. **Modeled microgravity cultivation modulates N-acylhomoserine lactone production in *Rhodospirillum rubrum* S1H independently of cell density.** *Microbiology*. 2013 Sep 11. [Epub ahead of print]

Wei L, Han F, Yue L, Zheng H, Yu D, Ma X, Cheng H, Li Y. **Synergistic Effects of Incubation in Rotating** Lawal A, Kirtley ML, van Lier CJ, Erova TE, Kozlova EV, Sha J, Chopra AK, Rosenzweig JA. **The Effects of Modeled Microgravity on Growth Kinetics, Antibiotic Susceptibility, Cold Growth, and the Virulence Potential of a Yersinia pestis ymoA-Deficient Mutant and Its Isogenic Parental Strain.** *Astrobiology*. 2013 Sep;13(9):821-32. doi: 10.1089/ast.2013.0968.

Bioreactors and Cumulative Low Dose⁶⁰ Co γ -ray Irradiation on Human Immortal Lymphoblastoid Cells. *Microgravity Science and Technology*. 2012 Nov; 24(5): 335-344. doi: 10.1007/s12217-012-9324-7.

McGowin CL, Radtke AL, Abraham K, Martin DH, Herbst-Kralovetz M. **Mycoplasma genitalium Infection Activates Cellular Host Defense and Inflammation Pathways in a 3-Dimensional Human Endocervical Epithelial Cell Model.** *J Infect Dis*. 2013 Apr 2. [Epub ahead of print]

Mycoplasma genitalium infection activates cellular host defense and inflammation pathways in a 3-dimensional human endocervical epithelial cell model.

McGowin CL, Radtke AL, Abraham K, Martin DH, Herbst-Kralovetz M. *J Infect Dis*. 2013 Jun 15;207(12):1857-68. doi: 10.1093/infdis/jit101. Epub 2013 Mar 14.

Foster JS, Khodadad CL, Ahrendt SR, Parrish M L. **Impact of simulated microgravity on the normal developmental time line of an animal-bacteria symbiosis.** *Sci Rep*. 2013 Feb 26;3:1340. doi: 10.1038/srep01340.

Berto A, Van der Poel WH, Hakze-van der Honing R, Martelli F, La Ragione RM, Inglese N, Collins J, Grierson S, John R, Reetz J, Dastjerdi A, Banks M. **Replication of hepatitis E virus in three-dimensional cell culture.** *J Virol Methods*. 2013 Feb;187(2):327-32. doi: 10.1016/j.jviromet.2012.10.017.

Microbial products alter the expression of membrane-associated mucin and antimicrobial peptides in a three-dimensional human endocervical epithelial cell model.

Radtke AL, Quayle AJ, Herbst-Kralovetz MM. *Biol Reprod*. 2012 Dec 6;87(6):132. doi: 10.1095/biolreprod.112.103366. Print 2012 Jun.

Rosenzweig JA, Chopra AK. **The effect of low shear force on the virulence potential of Yersinia pestis: new aspects that space-like growth conditions and the final frontier can teach us about a formidable pathogen.** *Front Cell Infect Microbiol*. 2012;2:107.

Vukanti R, Leff LG. **Expression of Multiple Stress Response Genes by Escherichia Coli Under Modeled Reduced Gravity.** *J Microgravity Science and Technology*. 2012 Sept 1;24(4):267-79. doi: 10.1007/s12217-012-9310-0.

Aoyagi H, Kuroda A. **Effects of low-shear modeled microgravity on a microbial community filtered through a 0.2- μ m filter and its potential application in screening for novel microorganisms.** *J Biosci Bioeng*. 2012 Jul;114(1):73-9. doi: 10.1016/j.jbiosc.2012.02.021. Epub 2012 May 8.

Castro S.L., Nelman-Gonzalez M., Nickerson C.A., Ott, C.M. **Low fluid shear culture of Staphylococcus aureus induces attachment-independent biofilm formation and represses hfq expression.** *Appl Environ Microbiol*. 2011 Sep;77(18):6368-78.

Pacello F, Rotilio G, Battistoni A. **Low-Shear Modeled Microgravity Enhances Salmonella Enterica Resistance to Hydrogen Peroxide Through a Mechanism Involving KatG and KatN.** *Open Microbiol J*. 2012;6:53-64.

Rosado H, O'Neill AJ, Blake KL, Walther M, Long PF, Hinds J, Taylor PW. **Rotating wall vessel exposure alters protein secretion and global gene expression in Staphylococcus aureus.** *International Journal of Astrobiology*. 2012 Apr;11(2):71-81. doi: 10.1017/S1473550411000346.

Xiao Y, Liu Y, Wang G. **Involvement of nitric oxide in the mechanism of biochemical alterations induced by simulated microgravity in Microcystis aeruginosa.** *Advances in Space Research*. 2012 March 1; 49(5):850-8. doi: 10.1016/j.asr.2011.11.003.

Mellata M, Maddux JT, Nam T, Thomson N, Hauser H, Stevens MP, Mukhopadhyay S, Sarker S, Crabbé A, Nickerson CA, Santander J, Curtiss R 3rd. **New insights into the bacterial fitness-associated mechanisms**

revealed by the characterization of large plasmids of an avian pathogenic *E. coli*. *PLoS One*. 2012;7(1):e29481.

R Vukanti, MA Model, LG Leff; **Effect of modeled reduced gravity conditions on bacterial morphology and physiology** *BMC Microbiol*. 2012 Jan 12;12:4

Straub TM, Bartholomew RA, Valdez CO, Valentine NB, Dohnalkova A, Ozanich RM, Bruckner-Lea CJ, Call DR. **Human norovirus infection of caco-2 cells grown as a three-dimensional tissue structure.** *J Water Health*. 2011 Jun;9(2):225-40.

Crabbé A, Sarker SF, Van Houdt R, Ott CM, Leys N, Cornelis P, Nickerson CA. **Alveolar epithelium protects macrophages from quorum sensing-induced cytotoxicity in a three-dimensional co-culture model.** *Cell Microbiol*. 2011 Mar;13(3):469-81. doi: 10.1111/j.1462-5822.2010.01548.x.

Crabbé A, Schurr MJ, Monsieurs P, Morici L, Schurr J, Wilson JW, Ott CM, Tsaprailis G, Pierson DL, Stefanyshyn-Piper H, Nickerson CA. **Transcriptional and proteomic responses of *Pseudomonas aeruginosa* PAO1 to spaceflight conditions involve Hfq regulation and reveal a role for oxygen.** *Appl Environ Microbiol*. 2011 Feb;77(4):1221-30.

Dornmayr-Pfaffenhuemer M, Legat A, Schwimbersky K, Fendrihan S, Stan-Lotter H. **Responses of haloarchaea to simulated microgravity.** *Astrobiology*; 11(3):199-205. 2011

Qi F, Dai D, Liu Y, Kaleem I, Li C .**Effects of low-shear modeled microgravity on the characterization of recombinant β -D-glucuronidase expressed in *Pichia pastoris*.** *Appl Biochem Biotechnol*.; 163(1):162-7, 2011

Hensley DM. **Maintenance of antimicrobial susceptibility of *Acinetobacter baumannii* in modeled microgravity.** *Clin Lab Sci*. 2010 Spring;23(2):84-8

Radtke AL, Wilson JW, Sarker S, Nickerson CA. **Analysis of Interactions of *Salmonella* type three secretion mutants with 3-D intestinal epithelial cells.** *PLoS One* 29;5:e15750, 2010

Barrila J, Radtke AL, Crabbe A, Sarker SF, Herbst-Kralovetz MM, Ott, CM, Nickerson CA. **Organotypic 3D cell culture models: using the rotating wall vessel to study host-pathogen interactions.** *Nature Rev Microbiol* 8:791-801, 2010

Crabbe A, Pycke B, Van Houdt R, Monsieurs P, Nickerson C, Leys N, Cornelis P. **Response of *Pseudomonas aeruginosa* PAO1 to low shear modeled microgravity involves AlgU regulation.** *Environ Microbiol* 12:1545-1564, 2010

Rosenzweig JA, Abogunde O, Thomas K, Lawal A, Nguyen YU, Sodipe A, Jejelowo O. **Spaceflight and modeled microgravity effects on microbial growth and virulence.** *Appl Microbiol Biotechnol* 85:885-891, 2010

Beuls E, Van Houdt R, Leys Y, Dijkstra C Larkin O, Mahillon J. **Bacillus thuringiensis conjugation in simulated microgravity.** *Astrobiology*. 9: 797-805, 2009

Crabbé A, De Boever P, Van Houdt R, Moors H, Mergeay M, Cornelis P. **Use of the rotating wall vessel technology to study the effect of shear stress on growth behaviour of *Pseudomonas aeruginosa* PAO1.** *Environ Microbiol* 10: 2098-2110, 2008

Warren CA, Destura, RV, Sevilleja JEAD, Barroso LF, Carvalho H, Barrett LJ, O'Brien, AD, Guerrant RL., **Detection of Epithelial-Cell Injury, and Quantification of Infection, in the HCT-8 Organoid Model of Cryptosporidiosis.** *J Infect Dis* 198: 143-149, 2008

Wilson JW ,Ott CM, Quick L, Davis R, Zu Bentrup KH, Crabbe´ A, Richter E, Sarker S, Barrila J, Porwollik S, Cheng P, McClelland M, Tsaprailis G, Radabaugh T, Hunt A, Shah M, Nelman-Gonzalez M, Hing S, Parra M, Dumars P, Norwood K, Bober R, Devich J, Ruggles A, deBaca AC, Narayan S, Benjamin J, Goulart C, Rupert M, Catella L, Schurr MJ, Buchanan K, Morici L, McCracken J, Porter MD, Pierson DL, Smith SM, Mergeay M, Leys

- N, Stefanyshyn-Piper HM, Gorie D, Nickerson CA. **Media Ion Composition Controls Regulatory and Virulence Response of Salmonella in Spaceflight.** *PLoS ONE* 3: e3923, 2008
- Warren CA, Destura RV, Emmanuel J, Sevilleja AD, Barroso LF, Carvalho H, Barrett LJ, O'Brien AD, Guerrant RL. **Detection of Epithelial-Cell Injury, and Quantification of Infection, in the HCT-8 Organoid Model of Cryptosporidiosis.** *J Infect Dis* 198:143-149, 2008
- Wilson JW, Ott CM, Zu Bentrup KH, Ramamurthy R, Quick L, Porwollik S, Cheng P, McClelland M, Tsaprailis G, Radabaugh T, Hunt A, Fernandez D, Richter E, Shah WM, Kilcoyne M, Joshi L, Nelman-Gonzalez M, Hing S, Parra M, Dumars P, Norwood K, Bober R, Devich J, Ruggles A, Goulart C, Rupert M, Stodieck L, Stafford P, Catella L, Schurr MJ, Buchanan K, Morici L, McCracken J, Allen P, Baker-Colman C, Hammond T, Vogel J, Nelson R, Pierson DL, Stefanyshyn-Piper HM, Nickerson CA. **Space flight alters bacterial gene expression and virulence and reveals a role for global regulator Hfq.** *Proc Natl Acad Sci USA* 104: 16299-16304, 2007
- Nickerson CA, Richter EG, Ott CM, **Studying host-pathogen interactions in 3-D: organotypic models for infectious disease and drug development.** *J Neuroimmune Pharmacol.* 2007 2:26-31, 2007
- Straub TM, Honer zu Bentrup K, Orosz-Coghlan, P, Dohnalkova A, Mayer BK, Bartholomew RA, Valdez CO, Bruckner-Lea C, Gerba CP, Abbaszadegan M, Nickerson CA, **In vitro Cell Culture Infectivity Assay for Human Noroviruses.** *Emerging Infectious Diseases* 13: 396-403, 2007
- Tucker DL, Ott CM, Huff, S, Fofanov V, Willson RC, Fox GE. **Characterization of Escherichia coli MG1655 grown in a low shear modeled microgravity environment.** *BMC Microbiology* 7: 15, 2007
- Nauman EA, Ott CM, Sander E, Tucker DL, Pierson D, Wilson JW, Nickerson CA. **A Novel Quantitative Biosystem to Model Physiological Fluid Shear Stress on Cells.** *Appl Environ Microbiol* 73:699-705, 2006
- Smith YC, Grande KK, Rasmussen SB, O'Brien AD. **Novel three-dimensional organoid model for evaluation of the interaction of uropathogenic Escherichia coli with terminally differentiated human urothelial cells.** *Infect. Immun.* 74: 750-757, 2006
- Lynch SV, Mukundakrishnan K, Benoit MR, Ayyaswamy PS, Matin A. **Escherichia coli biofilms formed under low-shear modeled microgravity in a ground-based system.** *Appl. Environ. Microbiol.* 72: 7701-7710, 2006
- Honer Zu Bentrup K, Ramamurthy R, Ott CM, Emami K, Nelman-Gonzalez M, Wilson JW, Richter EG, Goodwin TJ, Alexander JS, Pierson DL, Pellis N, Buchanan KL, Nickerson CA. **Three-dimensional organotypic models of human colonic epithelium to study the early stages of enteric salmonellosis.** *Microbes Infect.* 8: 1813-182, 2006.
- Carvalho HM, Teel LD, Goping G, O'Brien AD: **A three-dimensional tissue culture model for the study of attach and efface lesion formation by enteropathic and enterohaemorrhagic Escherichia coli.** *Cell Microbiol* 7: 1771-1781, 2005.
- Carterson AJ, Honer zu Bentrup K, Ott CM, Clarke MS, Pierson DL, Vanderburg CR, Buchanan KL, Nickerson CA, Schurr MJ: **A549 Lung Epithelial Cells Grown as Three-Dimensional Aggregates: Alternative Tissue Culture Model for Pseudomonas Aeruginosa Pathogenesis.** *Infect Immun* 73: 1129-1140, 2005.
- Duray P, Yin S, Ito Y, Bezrukov L, Cox C, Cho M, Fitzgerald W: **Invasion of Human Tissue Ex Vivo by Borrelia: Journal of Infectious Diseases** 191:1747-1754 2005
- Ciftcioglu N, Haddad RS, Golden DC, Morrison DR, McKay DS: **A Potential Cause for Kidney Stone Formation During Space Flights: Enhanced Growth of Nanobacteria in Microgravity.** *Kidney Int.* 67: 483-491, 2005.
- LaMarca H.L, Ott C.M, Höner zu Bentrup K, LeBlanc C.L, Pierson D.L, Nelson A.B, Scandurro A.B, Whitley G.St.J, Nickerson C.A, and C.A.Morris: **Three-Dimensional Growth of Extravillous Cytotrophoblasts Promotes Differentiation and Invasion.** *Placenta* 26::709-720, 2005
- Lynch SV, Brodie EL, Matin A: **Role and Regulation of Sigma S in General Resistance Conferred by Low-shear Simulated Microgravity in Escherichia Coli.** *J Bacteriol* 186: 8207-8212, 2004.

Nickerson CA, Ott CM, Wilson JW, Ramamurthy R, Pierson DL: **Microbial Responses to Microgravity and Other Low-Shear Environments.** *Microbiol Mol Biol Rev* Jun; 68: 345-61, 2004.

Nickerson CA, Ott CM: **A New Dimension in Modeling Infectious Disease.** *ASM News* 70: 169-175, 2004.

England LS, Gorzelak M, Trevors JT: **Growth and Membrane Polarization in *Pseudomonas aeruginosa* UG2 Grown in Randomized Microgravity in a High Aspect Ratio Vessel.** *Biochimica et Biophysica Acta* 1624: 76-81, 2003.

Nickerson CA, Ott CM, Wilson JW, Ramamurthy R, LeBlanc CL, et al.: **Low-Shear Modeled Microgravity: A Global Environmental Regulatory Signal Affecting Bacterial Gene Expression, Physiology, and Pathogenesis.** *Journal of Microbiological Methods* 54:1-11, 2003.

Johanson K, Allen PL, Lewis F, Cubano LA, Hyman LE, Hammond TG: **Saccharomyces cerevisiae Gene Expression Changes During Rotating Wall Vessel Suspension Culture,** *J Appl Physiol.* 2171-2180, 2002.

Wilson JW, Ott CM, Ramamurthy R, Porwollik S, McClelland M, Pierson DL, Nickerson CA: **Low-Shear Modeled Microgravity Alters the Salmonella Enterica Serovar Typhimurium Stress Response in an RpoS-independent Manner.** *Applied and Environmental Microbiology* 68:5408-5416, 2002.

Wilson JW, Ramamurthy R, Porwollik S, McClelland M, Hammond T, Allen P, Ott CM, Pierson DL, Nickerson CA: **Microarray Analysis Identifies Salmonella Genes Belonging to the Low-Shear Modeled Microgravity Regulon,** *Proc. Natl. Acad. Sci. USA* 99: 13807-13812, 2002

Demain AL and Fang A: **Secondary Metabolism in Simulated Microgravity,** *Chem Rec* 1: 333-346, 2001.

Gao Q, Fang A, Pierson DL, Mishra SK, Demain AL: **Shear Stress Enhances Microcin B17 Production in a Rotating Wall Bioreactor, But Ethanol Does Not.** *Appl Microbiol Biotechnol* 56: 384-387, 2001.

Nickerson CA, Goodwin TJ, Terlonge J, Ott CM, Buchanan KL, Uicker WC, Emami K, LeBlanc C, Ramamurthy R, Clarke MS, Vanderburg CR, Hammond T, Pierson DL: **Three-Dimensional Tissue Assemblies: Novel Models for the Study of Salmonella Enterica Serovar Typhimurium Pathogenesis.** *Infect Immun* 69: 7106-7120, 2001.

Nickerson CA, Ott M, Mister SJ, Morrow BJ, Burns-Keliher L, Pierson DL: **Microgravity as a Novel Environmental Signal Affecting Microbial Virulence.** *Infect. Immun.* 68: 3147-3150, 2000.

Fang A, Pierson DL, Mishra SK, Demain AL: **Relief from Glucose Interference in Microcin B17 Biosynthesis by Growth in a Rotating-Wall Bioreactor.** *Lett Appl Microbiol* 31: 39-41, 2000.

Fang A, Pierson DL, Koenig DW, Mishra SK, and Demain AL: **Effect of Simulated Microgravity and Shear Stress on Microcin B17 Production by Escherichia Coli and on its Excretion into the Medium.** *Appl Environ Microbiol* 63: 4090-4092, 1997.

Fang A., Pierson DL, Mishra SK, Koenig DW and Demain AL: **Gramicidin S Production by Bacillus Brevis in Simulated Microgravity.** *Curr Microbiol* 34: 199-204, 1997.

Fang A, Pierson DL, Mishra SK, Koenig DW and Demain AL: **Secondary Metabolism in Simulated Microgravity: B-Lactam Production by Streptomyces Clavuligerus.** *J Ind Microbiol Biotechnol* 18: 22-25, 1997.

NEURAL/NEUROENDOCRINE

Engineering three dimensional micro nerve tissue using postnatal stem cells from human dental apical papilla.

Kim BC, Jun SM, Kim SY, Kwon YD, Choe SC, Kim EC, Lee JH, Kim J, Suh JF, Hwang YS. *Biotechnol Bioeng.* 2016 Oct 24. doi: 10.1002/bit.26205.

Effects of simulated microgravity on human brain nervous tissue.

Wang X, Du J, Wang D, Zeng F, Wei Y, Wang F, Feng C, Li N, Dai R, Deng Y, Quan Z, Qing H. *Neurosci Lett*. 2016 Aug 3;627:199-204. doi: 10.1016/j.neulet.2016.06.004. *Neurosci Lett*. 2016 Aug 3;627:199-204.

3D tissue-like assemblies: A novel approach to investigate virus-cell interactions.

Goodwin TJ, McCarthy M, Cohrs RJ, Kaufer BB. *Methods*. 2015 May 15. pii: S1046-2023(15)00203-0. doi: 10.1016/j.ymeth.2015.05.010.

RCCS Bioreactor-Based Modelled Microgravity Induces Significant Changes on In Vitro 3D Neuroglial Cell Cultures.

Morabito C, Steimberg N, Mazzoleni G, Guarnieri S, Fano-Illic G, Mariggio MA. *Biomed Res Int*. 2015 Jan 13; 2015:754283. doi 10.1155/2015/754283

Luo H, Zhu B, Zhang Y, Jin Y. Tissue-Engineered Nerve Constructs Under a Microgravity System for Peripheral Nerve Regeneration. *Tissue Eng Part A*. 2014 Sep 16. (Epub ahead of print)

Redden RA, Iyer R, Brodeur GM, Doolin EJ. **Rotary bioreactor culture can discern specific behavior phenotypes in Trk-null and Trk-expressing neuroblastoma cell lines.** *In Vitro Cell Dev Biol Anim*. 2014 Jan 30. (Epub ahead of print)

Chiang MC, Lin H, Cheng YC, Yen CH, Huang RN, Lin KH. **Beta-adrenoceptor pathway enhances mitochondrial function in human neural stem cells via rotary cell culture system.** *J Neurosci Methods*. 2012 Jun 15;207(2):130-6. Epub 2012 Apr 13

Chen J, Liu R, Yang Y, Li J, Zhang X, Li J, Wang Z, Ma J. **The simulated microgravity enhances the differentiation of mesenchymal stem cells into neurons.** *Neurosci Lett*.;505(2):171-5. Nov 2011

Redden RA, Doolin EJ. **Microgravity assay of neuroblastoma: in vitro aggregation kinetics and organoid morphology correlate with MYCN expression.** *In Vitro Cell Dev Biol Anim*. 47(4):312-7, 2011

Valmikinathan CM, Hoffman J, Yu X. **Impact of Scaffold Micro and Macro Architecture on Schwann Cell Proliferation under Dynamic Conditions in a Rotating Wall Vessel Bioreactor.** *Mater Sci Eng C Mater Biol Appl*. 2011 Jan 1;31(1):22-29

Bi L, Qu LN, Huang ZM, Wang CY, Li Q, Tan YJ, Li YH. **Effects of parabolic flight on redox status in SH-SY5Y cells** *Sheng Li Xue Bao*. 61: 445-50,2009

Ma W, Tavakoli T, Chen S, Maric D, Liu JL, O'Shaughnessy TJ. **Reconstruction of Functional Cortical-Like Tissues from Neural Stem and Progenitor Cells.** *Tissue Eng Part A* 14: 1687-1697, 2008

Hahn H, Muller M, Lowenheim H. **Whole organ culture of the postnatal sensory inner ear in simulated microgravity.** *J Neurosci Methods* 171: 60-71, 2008

Shamekh R, Cameron DF, Willing AE, Saporta S: **The role of connexins in the differentiation of NT2 cells in Sertoli-NT2 cell tissue constructs grown in the rotating wall bioreactor.** *Exp Brain Res* 170: 277-284, 2006.

Saporta S, Willing AE, Shamekh R, Bickford P, Paredes D, Cameron DF: **Rapid Differentiation of NT2 Cells in a Sertoli-NT2 Cell Tissue Constructs Grown in the Rotating Wall Bioreactor.** *Brain Res Bull* 64: 347-356, Dec 2004.

Cameron DF, Hushen JJ, Colina L, Mallery J, Willing A, Sanberg PR, Saporta S: **Formation and Structure of Transplantable Tissue Constructs Generated in Simulated Microgravity From Sertoli Cells and Neuron Precursors.** *Cell Transplant* 13: 755-763, 2004.

Lin HJ, O'Shaughnessy TJ, Kelly J, Ma W: **Neural Stem Cell Differentiation in a Cell-collagen-bioreactor Culture System.** *Develop. Brain Res* 153: 163-173, 2004.

Wang SS and Good TA: **Effect of Culture in a Rotating Wall Bioreactor on the Physiology of Differentiated Neuron-Like PC12 and SH-SY5Y Cells**, *J Cell Biochem* 83:574-584, 2001.

Low, H.P., Savarese, T.M., and Schwartz, W.J.: **Neural Precursor Cells Form Rudimentary Tissue-Like Structures in a Rotating-Wall Vessel Bioreactor**. *In Vitro Cell Dev Biol Anim* 37: 141-147, 2001.

Leikes P. *et al.*: **Simulated Microgravity Conditions Enhance Differentiation of Cultured PC12 Cells Towards the Neuroendocrine Phenotype**. *In Vitro Cell Dev Biol Anim* 34: 316-325, 1998.

PROSTATE

Sung SY, Liao CH, Wu HP, Hsiao WC, Wu IH, Jinpu, Yu, Lin SH, Hsieh CL. **Loss of Let-7 MicroRNA Upregulates IL-6 in Bone Marrow-Derived Mesenchymal Stem Cells Triggering a Reactive Stromal Response to Prostate Cancer**. *PLoS One*. 2013 Aug 19;8(8):e71637. doi: 10.1371/journal.pone.0071637.

Clejan S, O'Connor K and Rosenweig N: **Tri-dimensional Prostate Cell Cultures in Simulated Microgravity and Induced Changes in Lipid Second Messengers and Signal Transduction**. *J Cell Mol Med* 5:60-73, 2001.

Margolis L, Hatfill S, Chuaqui R, Vocke C, Emmert-Buck M, Linehan WM and Duray PH: **Long Term Organ Culture of Human Prostate Tissue in a NASA-Designed Rotating Wall Bioreactor**. *J Urol* 161: 290-297, 1999.

RENAL

Cowger NL, Benes E, Allen PL, and Hammond TG: **Expression of Renal Cell Protein Markers is Dependent on Initial Mechanical Culture Conditions**, *J Appl Physiol* 92: 691-700, 2002.

Kaysen JH, Campbell WC, Majewski RR, Goda FO, Navar GL, Lewis FC, Goodwin TJ, Hammond TG: **Select De Novo Gene and Protein Expression During Renal Epithelial Cell Culture in Rotating Wall Vessels is Shear Stress Dependent**. *J Memb Biol* 168: 77-89, 1999.

REPRODUCTIVE

IL-36 γ Augments Host Defense and Immune Responses in Human Female Reproductive Tract Epithelial Cells

Sean M. Winkle, Andrea L. Throop and Melissa M. Herbst-Kralovetz. *Front. Microbiol.*, 17 June 2016
<http://dx.doi.org/10.3389/fmicb.2016.00955>

A three-dimensional culture system recapitulates placental syncytiotrophoblast development and microbial resistance.

McConkey CA1, Delorme-Axford E, Nickerson CA, Kim KS, Sadovsky Y, Boyle JP, Coyne CB. *Sci Adv*. 2016 Mar 4;2(3):e1501462. doi: 10.1126/sciadv.1501462. eCollection 2016.

Simulated Microgravity Using a Rotary Culture System Compromises the In Vitro Development of Mouse Preantral Follicles.

Zhang S, Zheng D, Wu Y, Lin W, Chen Z, Meng L, Liu J, Zhou Y1., *PLoS One*. 2016 Mar 10;11(3):e0151062. doi: 10.1371/journal.pone.0151062. eCollection 2016.

Establishment of a rotary aerobic culture system for in vitro culture of mouse testis.

Liu Y, Zhu YF, Gao ZB, Li M, Zhong LY, Yin DJ, Li Y, Nan Fang Yi Ke Da Xue Xue Bao. 2015 Jan 20;35(1):66-71 [Article in Chinese]

Effect of Culture in Simulated Microgravity on the Development of Mouse Embryonic Testes.

Nowacki D, Klinger FG, Mazur G, Felici MD. *Adv Clin Exp Med*. 2015 Sep-Oct;24(5):769-74. doi: 10.17219/acem/27920.

Tai J, Cheung SS, Hasman D. **Human Ovarian Cancer Multicellular Spheroids: A Model for Testing Antiproliferation Activity of Devil's Club (*Oplopanax horridus*) and Anticancer Agents.** *Planta Med.* 2014 Jun;80(8-9):662-70. doi: 10.1055/s-0034-1368506.

McGowin CL, Radtke AL, Abraham K, Martin DH, Herbst-Kralovetz M. **Mycoplasma genitalium Infection Activates Cellular Host Defense and Inflammation Pathways in a 3-Dimensional Human Endocervical Epithelial Cell Model.** *J Infect Dis.* 2013 Apr 2. [Epub ahead of print]

Radtke AL, Quayle AJ, Herbst-Kralovetz MM; **Microbial Products Alter the Expression of Membrane-Associated Mucin and Antimicrobial Peptides in a 3-D Human Endocervical Epithelial Cell Model.** *Biol Reprod.* 2012 Oct 10. [Epub ahead of print]

Wu C, Li L, Wei H, Wu Z, Jiang Q, Zhang S. **Tail-suspended model simulating mouse oocytes maturation inhibited with microgravity.** *Sheng Wu Yi Xue Gong Cheng Xue Za Zhi.* 2012 Aug;29(4):687-90, 696. (Abstract in English, Article in Chinese)

Pellegrini M, Di Siena S, Claps G, Di Cesare S, Dolci S, Rossi P, Geremia R, Grimaldi P, **Microgravity promotes differentiation and meiotic entry of postnatal mouse male germ cells.** *PLoS One* 4:5(2):e9064, 2010

Ricci G, Esposito R, Catizone A, Galdieri M. **Direct effects of microgravity on testicular function: analysis of histological, molecular and physiologic parameters.** *J Endocrinol Invest* 31:229-237, 2008

SALIVARY GLAND

Generation of Bioartificial Salivary Gland Using Whole-Organ Decellularized Bioscaffold

Gao Z, Wu T, Xu J, Liu G, Xie Y, Zhang C, Wang J, Wang S. *Cells Tissues Organs.* 2015 March 25; doi:10.00.1159/00371873

Lewis ML, Moriarity DM and Campbell PS: **Use of Microgravity Bioreactors for Development of an In Vitro Rat Salivary Gland Cell Culture Model.** *J Cell Biochem* 51: 265-273, 1993.

SIGNALLING

Microgravity induces proteomics changes involved in endoplasmic reticulum stress and mitochondrial protection.

Feger BJ, Thompson JW, Dubois LG, Kommaddi RP, Foster MW, Mishra R, Shenoy SK, Shibata Y, Kidane YH, Moseley M, Carnell LS, Bowles DE. *Sci Rep.* 2016 Sep 27;6:34091. doi: 10.1038/srep34091.

IL-36 γ Augments Host Defense and Immune Responses in Human Female Reproductive Tract Epithelial Cells

Sean M. Winkle, Andrea L. Throop and Melissa M. Herbst-Kralovetz. *Front. Microbiol.*, 17 June 2016 <http://dx.doi.org/10.3389/fmicb.2016.00955>

Li Y, Li S, Niu ZY, Bao B, Shi X. **The effect of Smads signal pathway on the osteogenesis of human periodontal ligament stem cells in simulated microgravity.** *Shanghai Kou Qiang Yi Xue.* 2012 Jun;21(3):246-50. (Abstract in English, Article in Chinese)

Puca A, Russo G, Giordano A. **Properties of mechano-transduction via simulated microgravity and its effects on intracellular trafficking of VEGFR's.** *Oncotarget.* 2012 Apr;3(4):426-34.

Simons DM, Gardner EM, Lelkes PI. **Intact T cell receptor signaling by CD4(+) T cells cultured in the rotating wall-vessel bioreactor.** *J Cell Biochem.* 109:1201-9, 2010

Zhou J, Hu L, Cui Z, Jiang X, Wang G, Krissansen GW, Sun X. **Interaction of SDF-1 α and CXCR4 plays an important role in pulmonary cellular infiltration in differentiation syndrome.** *Int J Hematol* 91:293-302, 2010

Kumar R, Harris-Hooker S, Sanford GL. The expression of growth factors and their receptors in retinal and endothelial cells cocultured in the rotating bioreactor. *Ethn Dis* 18(2 Suppl): S2-44-50, 2008

Vincent L, Avancena P, Cheng J, Rafii S, Rabbany S.: **Simulated Microgravity Impairs Leukemic Cell Survival Through Altering VEGFR-2/VEGF-A Signaling Pathway: *Annals of Biomedical Engineering*, 33: 1405-1410, 2005**

Nickerson CA, Ott CM, Wilson JW, Ramamurthy R, LeBlanc CL, et al.: **Low-Shear Modeled Microgravity: A Global Environmental Regulatory Signal Affecting Bacterial Gene Expression, Physiology, and Pathogenesis. *Journal of Microbiological Methods* 54: 1-11, 2003.**

Clejan S, O'Connor K and Rosenweig N: **Tri-dimensional Prostate Cell Cultures in Simulated Microgravity and Induced Changes in Lipid Second Messengers and Signal Transduction. *J Cell Mol Med* 5:60-73, 2001.**

Felix JA, Dirksen ER, Woodruff ML: **Selected Contribution: PKC Activation Inhibits Ca(2+) Signaling in Tracheal Epithelial Cells Kept in Simulated Microgravity. *J Appl Physiol* 89: 2855-2864, 2000.**

Felix JA, Chaban VV, Woodruff ML, Dirksen ER: **Mechanical Stimulation Initiates Intercellular Ca²⁺ Signaling in Intact Tracheal Epithelium Maintained Under Normal Gravity and Simulated Microgravity. *Am J Respir Cell Mol Biol* 18: 602-610, 1998.**

SKELETAL MUSCLE

Marquette ML, Byerly D, Sognier M. **A novel in vitro three-dimensional skeletal muscle model. *In Vitro Cell Dev Biol Anim.* 43:255-263, 2007**

Klement BJ, Young QM, George BJ, Nokkaew M: **Skeletal Tissue Growth, Differentiation, and Mineralization in the NASA Rotating Wall Vessel. *Bone* 34: 487-498, 2004.**

Slentz DH, Truskey GA, and Kraus WE: **Effects of Chronic Exposure to Simulated Microgravity on Skeletal Muscle Cell Proliferation. *In Vitro Cell Dev Biol Anim* 37: 148-156, 2001.**

Torgan CE, Burge SS, Collinsworth AM, Truskey GA, Kraus WE: **Differentiation of Mammalian Skeletal Muscle Cells Cultured on Microcarrier Beads in a Rotating Cell Culture System. *Med Biol Eng Comput* 38: 583-590, 2000.**

Molnar G, Schroedl NA, Gonda SR and Hartzell CR: **Skeletal Muscle Satellite Cells Cultured in Simulated Microgravity. *In Vitro Cell Dev Bio Anim* 33: 386-391, 1997.**

Klement BJ, Spooner BS: **Utilization of Microgravity Bioreactors for Differentiation of Mammalian Skeletal Tissue. *J Cell Biochem* 51: 252-256, 1993.**

SKIN

Acceleration of diabetic wound healing by a cryopreserved living dermal substitute created by micronized amnion seeded with fibroblasts.

Zheng Y, Ji S, Wu H, Tian S, Wang X, Luo P, Fang H, Wang Z, Wang J, Wang Z, Xiao S, Xia Z. *Am J Transl Res.* 2015 Dec 15;7(12):2683-93. eCollection 2015.

Use of amniotic microparticles coated with fibroblasts overexpressing SDF-1a to create an environment conducive to neovascularization for repair of full-thickness skin defects

Zhang YQ, Ju SZ, Fang H, Zheng YJ, Luo PF, Wu HB, Wu MJ, Wang ZH, Xiao SC, Xia ZF. *Cell Transplant.* 2015 April 7; doi:10.3727/096368915X687930

Lei XH, Ning LN, Cao YJ, Liu S, Zhang SB, Qiu ZF, Hu HM, Zhang HS, Liu S, Duan EK. **NASA-Approved Rotary Bioreactor Enhances Proliferation of Human Epidermal Stem Cells and Supports Formation of 3D Epidermis-Like Structure. *PLoS One.* 6(11):e26603; Nov 2011**

Ji SZ, Xiao SC, Luo PF, Huang GF, Wang GY, Zhu SH, Wu MJ, Xia ZF. **An epidermal stem cells niche microenvironment created by engineered human amniotic membrane.** *Biomaterials.*;32(31):7801-11, Nov 2011

He C, Deng LF, Zhu YP: **Experiment on fibroblast-PGA complexes cultured in Rotary Cell Culture System.** *Zhonghua Wai Ke Za Zhi* 41:214-217, 2003. [Article in Chinese, Abstract in English]

Doolin EJ, Geldziler B, Strande L, Kain M, Hewitt C: **Effects of Microgravity on Growing Cultured Skin Constructs.** *Tissue Eng* 5: 573-582, 1999.

SPACEFLIGHT

Microgravity induces proteomics changes involved in endoplasmic reticulum stress and mitochondrial protection.

Feger BJ, Thompson JW, Dubois LG, Kommaddi RP, Foster MW, Mishra R, Shenoy SK, Shibata Y, Kidane YH, Moseley M, Carnell LS, Bowles DE. *Sci Rep.* 2016 Sep 27;6:34091. doi: 10.1038/srep34091.

Simulated microgravity inhibits the migration of mesenchymal stem cells by remodeling actin cytoskeleton and increasing cell stiffness.

Mao X1 Chen Z, Luo Q, Zhang B, Song G. *Cytotechnology.* 2016 Oct 15.

Transfection of the IHH gene into rabbit BMSCs in a simulated microgravity environment promotes chondrogenic differentiation and inhibits cartilage aging.

Liu PC, Liu K1, Liu JF, Xia K, Chen LY, Wu X. *Oncotarget.* 2016 Sep 6;7(39):62873-62885. doi: 10.18632/oncotarget.11871.

Effects of simulated microgravity on human brain nervous tissue.

Wang X, Du J, Wang D, Zeng F, Wei Y, Wang F, Feng C, Li N, Dai R, Deng Y, Quan Z, Qing H. *Neurosci Lett.* 2016 Aug 3;627:199-204. doi: 10.1016/j.neulet.2016.06.004. *Neurosci Lett.* 2016 Aug 3;627:199-204.

Microgravity induces proteomics changes involved in endoplasmic reticulum stress and mitochondrial protection.

Feger BJ, Thompson JW, Dubois LG, Kommaddi RP, Foster MW, Mishra R, Shenoy SK, Shibata Y, Kidane YH, Moseley MA, Carnell LS, Bowles DE. *Sci Rep.* 2016 Sep 27;6:34091. doi: 10.1038/srep34091.

Effects of simulated microgravity on human brain nervous tissue.

Wang X, Du J, Wang D, Zeng F, Wei Y, Wang F, Feng C, Li N, Dai R, Deng Y, Quan Z, Qing H. *Neurosci Lett.* 2016 Aug 3;627:199-204. doi: 10.1016/j.neulet.2016.06.004. *Epub* 2016 Jun 3.

Simulated Microgravity Disrupts Cytoskeleton Organization and Increases Apoptosis of Rat Neural Crest Stem Cells Via Upregulating CXCR4 Expression and RhoA-ROCK1-p38 MAPK-p53 Signaling.

Lin SC, Gou GH, Hsia CW, Ho CW, Huang KL, Wu YF, Lee SY, Chen YH. *Stem Cells Dev.* 2016 Jul 6.

The International Space Station: an Extreme Environment for Key Host-Microbe Discoveries

C. Mark Ott, Thomas Marshburn, and Cheryl A. Nickerson. *Microbe—Volume 11, Number 6, 2016, Pages 253-261.*

Increased biofilm formation ability in *Klebsiella pneumoniae* after short-term exposure to a simulated microgravity environment.

Wang H, Yan Y, Rong D, Wang J, Wang H, Liu Z, Wang J, Yang R, Han Y. *Microbiologyopen.* 2016 May 16. doi: 10.1002/mbo3.370.

Microgravity Induction of TRAIL Expression in Preosteoclast Cells Enhances Osteoclast Differentiation.

Sambandam Y, Baird KL, Stroebel M, Kowal E, Balasubramanian S, Reddy SV. *Sci Rep.* 2016 May 4;6:25143. doi: 10.1038/srep25143.

Simulated Microgravity Using a Rotary Culture System Compromises the In Vitro Development of Mouse Preantral Follicles.

Zhang S, Zheng D, Wu Y, Lin W, Chen Z, Meng L, Liu J, Zhou Y1,.PLoS One. 2016 Mar 10;11(3):e0151062. doi: 10.1371/journal.pone.0151062. eCollection 2016.

Influence of Low-Shear Modeled Microgravity on Heat Resistance, Membrane Fatty Acid Composition, and Heat Stress-Related Gene Expression in Escherichia coli O157:H7 ATCC 35150, 43889, 43890, and 43895.

Kim HW, Rhee MS. Appl Environ Microbiol. 2016 Mar 4. pii: AEM.00050-16. Appl Environ Microbiol. 2016 Mar 4. pii: AEM.00050-16.

A Study of Alterations in DNA Epigenetic Modifications (5mC and 5hmC) and Gene Expression Influenced by Simulated Microgravity in Human Lymphoblastoid Cells.

Chowdhury B, Seetharam A, Wang Z, Liu Y, Lossie AC, Thimmapuram J, Irudayaraj J. PLoS One. 2016 Jan 28;11(1):e0147514. doi: 10.1371/journal.pone.0147514. eCollection 2016.

Hetero-cellular prototyping by synchronized multi-material bioprinting for rotary cell culture system.

Snyder J1, Son AR, Hamid Q, Wu H, Sun W. Biofabrication. 2016 Jan 13;8(1):015002.

High throughput de novo RNA sequencing elucidates novel responses in Penicillium chrysogenum under microgravity.

Sathishkumar Y, Krishnaraj C, Rajagopal K, Sen D., Lee YS. Bioprocess Biosyst Eng. 2015 Nov 24.

Adrenomedullin is a key Protein Mediating Rotary Cell Culture System that Induces the Effects of Simulated Microgravity on Human Breast Cancer Cells

Li Chen, Xi Yang, Xiang Cui, Minmin Jiang, Yu Gui, Yanni Zhang, Xiangdong Luo Microgravity Science and Technology November 2015, Volume 27, Issue 6, pp 417-426.

Effect of Culture in Simulated Microgravity on the Development of Mouse Embryonic Testes.

Nowacki D, Klinger FG, Mazur G, Felici MD. Adv Clin Exp Med. 2015 Sep-Oct;24(5):769-74. doi: 10.17219/acem/27920.

Genome Wide Expression Profiling of Cancer Cell Lines Cultured in Microgravity Reveals Significant Dysregulation of Cell Cycle and MicroRNA Gene Networks

Prasanna Vidyasekar, Pavithra Shyamsunder, Rajpranap Arun, Rajalakshmi Santhakumar, Nand Kishore Kapadia, Ravi Kumar, and Rama Shanker Verma PLoS One. 2015; 10(8): e0135958. Published online 2015 Aug 21. doi: 10.1371/journal.pone.0135958

The Wnt Inhibitor Sclerostin Is Up-regulated by Mechanical Unloading in Osteocytes in Vitro.

Spatz JM, Wein MN, Gooi JH, Qu Y, Garr JL, Liu S, Barry KJ, Uda Y, Lai F, Dedic C, Balcells-Camps M, Kronenberg HM, Babij P, Pajevic PD. J Biol Chem. 2015 Jul 3;290(27):16744-58. doi: 10.1074/jbc.M114.628313. Epub 2015 May 7.

The Effect of OSM on MC3T3-E1 Osteoblastic Cells in Simulated Microgravity with Radiation.

Goyden Goyden J, Tawara K, Hedeem D, Willey JS, Thom Oxford J, Jorcyk CL. PLoS One. 2015 Jun 1;10(6):e0127230. doi: 10.1371/journal.pone.0127230. eCollection 2015

A mesoscale study of the degradation of bone structural properties in modeled microgravity conditions.

Cosmi F, Steimberg N, Mazzoleni G. J Mech Behav Biomed Mater. 2015 Jan 12;44C:61-70. doi: 10.1016/j.jmbbm.2015.01.002

Spaceflight and simulated microgravity cause a significant reduction of key gene expression in early t-cell activation.

Martinez EM, Yoshida MC, Candelario TT, Hughes-Fulford M. Am J Physiol Regul Integr Comp Physiol. 2015 Jan 7;ajpregu.00449.2014. doi:10.1152/ajpregu.00449.2014. [Epub ahead of print]

The impact of simulated and real microgravity on bone cells and mesenchymal stem cells

Ulbrich C, Wehland M, Pietsch J, Aleshcheva G, Wise P, van Loon J, Magnusson N, Infanger M, Grosse J, Eilles C, Sundaresan A, Grimm D. Biomed Res Int. 2014;2014:928507. doi: 10.1155/2014/928507.

Experimental study on effect of simulated microgravity on structural chromosome instability of human peripheral blood lymphocytes.

Wei L, Liu C, Kang L, Liu Y, Shi S, Wu Q, Li Y. PLoS One. 2014 Jun 25;9(6):e100595. doi: 10.1371/journal.pone.0100595. eCollection 2014.

Integration Analysis of MicroRNA and mRNA Expression Profiles in Human Peripheral Blood Lymphocytes Cultured in Modeled Microgravity.

Girardi C, De Pittà C, Casara S, Calura E, Romualdi C, Celotti L, Mognato M. Biomed Res Int. 2014;2014:296747. doi: 10.1155/2014/296747

Conservation of the Low-shear Modeled Microgravity Response in Enterobacteriaceae and Analysis of the trp Genes in this Response.

Soni A, O'Sullivan L, Quick LN, Ott C, Nickerson CA, Wilson JW. Open Microbiol J. 2014 Jun 13;8:51-8. doi: 10.2174/1874285801408010051.

Growing tissues in real and simulated microgravity - new methods for tissue engineering.

Grimm D, Wehland M, Pietsch J, Aleshcheva G, Wise P, van Loon J, Ulbrich C, Magnusson NE, Infanger M, Bauer J.; Tissue Eng Part B Rev. 2014 Apr 4.

Microgravity control of autophagy modulates osteoclastogenesis.

Sambandam Y, Townsend MT, Pierce JJ, Lipman CM1, Haque A, Bateman TA, Reddy SV; Bone. 2014 Jan 23. pii: S8756-3282(14)00006-4. doi: 10.1016/j.bone.2014.01.004.

Simulated microgravity increases heavy ion radiation-induced apoptosis in human B lymphoblasts.

Dang B, Yang Y, Zhang E, Li W, Mi X, Meng Y, Yan S, Wang Z, Wei W, Shao C, Xing R, Lin C; Life Sci. 2013 Dec 21. pii: S0024-3205(13)00755-8. doi:10.1016/j.lfs.2013.12.008

Impact of simulated microgravity on the normal developmental time line of an animal-bacteria symbiosis.

Foster JS, Khodadad CL, Ahrendt SR, Parrish ML Sci Rep. 2013 Feb 26;3:1340. doi: 10.1038/srep01340.

Treatment of hydrogen molecule abates oxidative stress and alleviates bone loss induced by modeled microgravity in rats.

Sun Y, Shuang F, Chen DM, Zhou RB. Osteoporos Int. 2013 Mar;24(3):969-78. doi: 10.1007/s00198-012-2028-4.

Expression of Multiple Stress Response Genes by Escherichia Coli Under Modeled Reduced Gravity.

Vukanti R, Leff LG. J Microgravity Science and Technology. 2012 Sept 1;24(4):267-79. doi: 10.1007/s12217-012-9310-0.

The effects of simulated microgravity on intervertebral disc degeneration.

Jin L, Feng G, Reames DL, Shimer AL, Shen FH, Li X. Spine J. 2013 Mar;13(3):235-42. doi: 10.1016/j.spinee.2012.01.022.

Destrin deletion enhances the bone loss in hindlimb suspended mice.

Shuang F, Sun Y, Yang HH, Shao YC, Li H, Hu W, Zhong J, Zou HX. Eur J Appl Physiol. 2013 Feb;113(2):403-10. doi: 10.1007/s00421-012-2451-4.

Analysis of miRNA and mRNA expression profiles highlights alterations in ionizing radiation response of human lymphocytes under modeled microgravity.

Girardi C, De Pittà C, Casara S, Sales G, Lanfranchi G, Celotti L, Mognato M. PLoS One. 2012; 7(2):e31293.

Rotating wall vessel exposure alters protein secretion and global gene expression in Staphylococcus aureus.

Rosado H, O'Neill AJ, Blake KL, Walther M, Long PF, Hinds J, Taylor PW. International Journal of Astrobiology. 2012 Apr;11(2):71-81. doi: 10.1017/S1473550411000346.

Transcriptional and proteomic responses of Pseudomonas aeruginosa PAO1 to spaceflight conditions involve Hfq regulation and reveal a role for oxygen.

Crabbé A, Schurr MJ, Monsieurs P, Morici L, Schurr J, Wilson JW, Ott CM, Tsapraillis G, Pierson DL, Stefanyshyn-Piper H, Nickerson CA. Appl Environ Microbiol. 2011 Feb;77(4):1221-30.

Spaceflight and modeled microgravity effects on microbial growth and virulence.

Rosenzweig JA, Abogunde O, Thomas K, Lawal A, Nguyen YU, Sodipe A, Jejelowo O. *Appl Microbiol Biotechnol* 85:885-891, 2010

Response of *Pseudomonas aeruginosa* PAO1 to low shear modeled microgravity involves AlgU regulation.

Crabbe A, Pycke B, Van Houdt R, Monsieurs P, Nickerson C, Leys N, Cornelis P. *Environ Microbiol* 12:1545-1564, 2010

Microarray profile of gene expression during osteoclast differentiation in modelled microgravity.

Sambandam Y, Blanchard JJ, Daughtridge G, Kolb RJ, Shanmugarajan S, Pandravadana SN, Bateman TA, Redd., J *Cell Biochem*. 2010 Dec 1;111(5):1179-87.

Differential translocation of nuclear factor-kappaB in a cardiac muscle cell line under gravitational changes.

Kwon O, Tranter M, Jones WK, Sankiovic JM, Banerjee RK. *J Biomech Eng*. 131:064503, 2009

***Bacillus thuringiensis* conjugation in simulated microgravity.**

Beuls E, Van Houdt R, Leys Y, Dijkstra C Larkin O, Mahillon J. *Astrobiology*. 9: 797-805, 2009

Sub-mitogenic phorbol myristate acetate co-stimulation rescues the PHA-induced activation of both naïve and memory T cells cultured in the rotating-wall vessel bioreactor.

Simmons DM, Gardner EM, Lelkes PI. *Cell Biol Intl*. 33:882-6, 2009

Global transcriptome analysis in mouse calvarial osteoblasts highlights sets of genes regulated by modeled microgravity and identifies a "mechanoresponsive osteoblast gene signature"

Capulli M, Rufo A, Teti A, Rucci N. *J. Cell Biochem*. 107:240-52, 2009

Simulated microgravity decreases DNA repair capacity and induces DNA damage in human lymphocytes.

Kumari R, Singh KP, Dumond JW Jr. *J. Cell Biochem*.107:723-31, 2009

Media Ion Composition Controls Regulatory and Virulence Response of *Salmonella* in Spaceflight.

Wilson JW ,Ott CM, Quick L, Davis R, Zu Bentrup KH, Crabbe A, Richter E, Sarker S, Barrila J, Porwollik S, Cheng P, McClelland M, Tsaprailis G, Radabaugh T, Hunt A, Shah M, Nelman-Gonzalez M, Hing S, Parra M, Dumars P, Norwood K, Bober R, Devich J, Ruggles A, deBaca AC, Narayan S, Benjamin J, Goulart C, Rupert M, Catella L, Schurr MJ, Buchanan K, Morici L, McCracken J, Porter MD, Pierson DL, Smith SM, Mergeay M, Leys N, Stefanyshyn-Piper HM, Gorie D, Nickerson CA. *PLoS ONE* 3: e3923, 2008

Osteoblast and Osteoclast Differentiation in Modeled Microgravity.

Saxena R, McDonald J. *Ann NY Acad Sci*. 1116: 494-498, 2007

The effect of simulated microgravity on osteoblasts is independent of the induction of apoptosis.

Bucaro MA, Zahm AM, Risbud MV, Avyaswamy PS, Mukundakrishnan K, Steinbeck MJ, Shapiro IM, Adams CS. *J Cell Biochem* 102: 483-495, 2007

Modeled microgravity stimulates osteoclastogenesis and bone resorption by increasing osteoblast RANK/OPG ratio.

Rucci N, Rufo A, Alamanou M, Teti A. *J. Cell. Biochem*. 100: 464-473, 2007

A Potential Cause for Kidney Stone Formation During Space Flights: Enhanced Growth of Nanobacteria in Microgravity.

Ciftcioglu N, Haddad RS, Golden DC, Morrison DR, McKay DS: *Kidney Int*. 67: 483- 491, 2005.

Space flight alters bacterial gene expression and virulence and reveals a role for global regulator Hfq.

Wilson JW, Ott CM, Zu Bentrup KH, Ramamurthy R, Quick L, Porwollik S, Cheng P, McClelland M, Tsaprailis G, Radabaugh T, Hunt A, Fernandez D, Richter E, Shah WM, Kilcoyne M, Joshi L, Nelman-Gonzalez M, Hing S, Parra M, Dumars P, Norwood K, Bober R, Devich J, Ruggles A, Goulart C, Rupert M, Stodieck L, Stafford P, Catella L, Schurr MJ, Buchanan K, Morici L, McCracken J, Allen P, Baker-Colman C, Hammond T, Vogel J, Nelson R, Pierson DL, Stefanyshyn-Piper HM, Nickerson CA. *Proc Natl Acad Sci USA* 104: 16299-16304, 2007

Gene expression alterations in activated human T-cells induced by modeled microgravity.

Ward NE, Pellis NR, Risin SA, Risin D.; J. Cell. Biochem. 99: 1187-1202, 2006

Impact of modeled microgravity on microvascular endothelial cells.

Cotrupi S, Ranzani D, Maier JA: Biochem Biophys Acta 1746(2):163-168, 2005.

Impact of Modeled Microgravity on Migration, Differentiation, and Cell Cycle Control of Primitive Human Hematopoietic Progenitor Cells.

Plett PA, Abonour R, Frankovitz SM, Orschell CM; Experimental Hematology 32: 773-781, 2004.

Low-Shear Modeled Microgravity: A Global Environmental Regulatory Signal Affecting Bacterial Gene Expression

Nickerson CA, Ott CM, Wilson JW, Ramamurthy R, LeBlanc CL, et al.: Physiology, and Pathogenesis. Journal of Microbiological Methods 54:1-11, 2003.

Effect of Simulated Microgravity on the Production of IL-12 by PBMC's.

Bakos A, Varkonyi A, Minarovits J, Batkai L: J Gravit Physiol. 9: 293-294, 2002.

Low-Shear Modeled Microgravity Alters the Salmonella Enterica Serovar Typhimurium Stress Response in an RpoS Independent Manner.

Wilson JW, Ott CM, Ramamurthy R, Porwollik S, McClelland M, Pierson DL, Nickerson CA. Applied and Environmental Microbiology 68:5408-5416, 2002.

Microarray Analysis Identifies Salmonella Genes Belonging to the Low-Shear Modeled Microgravity Regulon

Wilson JW, Ramamurthy R, Porwollik S, McClelland M, Hammond T, Allen P, Ott CM, Pierson DL, Nickerson CA: Proc. Natl. Acad. Sci. USA 99: 13807-13812, 2002

Proliferation of Human Hematopoietic Bone Marrow Cells in Simulated Microgravity.

Plett PA, Frankovitz SM, Abonour R, Orschell-Traycoff CM; In Vitro Cell Dev Biol Anim 37: 73-78, 2001.

Simulated Microgravity Impairs Respiratory Burst Activity in Human Promyelocytic Cells.

Hughes JH and Long JP; In Vitro Cell Dev Biol Anim 37: 209-215, 2001.

Secondary Metabolism in Simulated Microgravity

Demain AL and Fang A: Chem Rec 1: 333-346, 2001.

Multiple Interleukin-2 Signaling Pathways Differentially Regulated by Microgravity.

Licato LL, Grimm EA; Immunopharmacology 44: 273-9, 1999.

STEM CELLS

Three-dimensional simulated microgravity culture improves the proliferation and odontogenic differentiation of dental pulp stem cell in PLGA scaffolds implanted in mice.

Li Y, He L, Pan S, Zhang L, Zhang W, Yi H, Niu Y. Mol Med Rep. 2017 Feb;15(2):873-878. doi: 10.3892/mmr.2016.6042.

Engineering three dimensional micro nerve tissue using postnatal stem cells from human dental apical papilla.

Kim BC, Jun SM, Kim SY, Kwon YD, Choe SC, Kim EC, Lee JH, Kim J, Suh JF, Hwang YS. Biotechnol Bioeng. 2016 Oct 24. doi: 10.1002/bit.26205.

Development of a Three-Dimensional Bioengineering Technology to Generate Lung Tissue for Personalized Disease Modeling.

Wilkinson DC, Alva-Ornelas JA, Sucre JM, Vijayaraj P, Durra A, Richardson W, Jonas SJ, Paul MK, Karumbayaram S, Dunn B, Gomperts BN. Stem Cells Transl Med. 2016 Sep 15. pii: sctm.2016-0192.

Transfection of the IHH gene into rabbit BMSCs in a simulated microgravity environment promotes chondrogenic differentiation and inhibits cartilage aging.

Liu PC, Liu K1, Liu JF, Xia K, Chen LY, Wu X. *Oncotarget*. 2016 Sep 6;7(39):62873-62885. doi: 10.18632/oncotarget.11871.

Paclitaxel-releasing mesenchymal stromal cells inhibit the growth of multiple myeloma cells in a dynamic 3D culture system.

Bonomi A, Steimberg N, Benetti A, Berenzi A, Alessandri G, Pascucci L, Boniotti J, Coccè V, Sordi V, Pessina A, Mazzoleni G. *Hematol Oncol*. 2016 Jun 10. doi: 10.1002/hon.2306.

Uniform Embryoid Body Production and Enhanced Mesendoderm Differentiation with Murine Embryonic Stem Cells in a Rotary Suspension Bioreactor.

Lei X, Deng Z, Duan E. *Methods Mol Biol*. 2016 Apr 27.

Novel Bioreactor Platform for Scalable Cardiomyogenic Differentiation from Pluripotent Stem Cell-Derived Embryoid Bodies.

Rungarunlert S, Ferreira JN, Dinnyes A. *Methods Mol Biol*. 2016 Apr 5

Induction of mesenchymal stem cell chondrogenic differentiation and functional cartilage microtissue formation for in vivo cartilage regeneration by cartilage extracellular matrix-derived particles.

Yin H, Wang Y, Sun Z, Sun X, Xu Y, Li P, Meng H, Yu X, Xiao B, Fan T, Wang Y, Xu W, Wang A, Guo Q, Peng J, Lu S. *Acta Biomater*. 2016 Jan 20. pii: S1742-7061(16)30024-1. doi: 10.1016/j.actbio.2016.01.024.

Hypoxia Created Human Mesenchymal Stem Cell Sheet for Prevascularized 3D Tissue Construction.

Zhang L, Xing Q, Qian Z, Tahtinen M, Zhang Z, Shearier E, Qi S, Zhao F. *Adv Healthc Mater*. 2015 Dec 14. doi: 10.1002/adhm.2

Adrenomedullin is a key Protein Mediating Rotary Cell Culture System that Induces the Effects of Simulated Microgravity on Human Breast Cancer Cells

Li Chen, Xi Yang, Xiang Cui, Minmin Jiang, Yu Gui, Yanni Zhang, Xiangdong Luo *Microgravity Science and Technology* November 2015, Volume 27, Issue 6, pp 417-426.

Scaffold-free and scaffold-assisted 3D culture enhances differentiation of bone marrow stromal cells.

Vidyasekar P, Shyamsunder P, Sahoo SK, Verma RS, *In Vitro Cell Dev Biol Anim*. 2015 Nov 5.

Scaffold-free, Human Mesenchymal Stem Cell-Based Tissue Engineered Blood Vessels.

Jung Y, Ji H, Chen Z, Fai Chan H, Atchison L, Klitzman B, Truskey G, Leong KW. *Sci Rep*. 2015 Oct 12;5:15116. doi: 10.1038/srep15116.

Differentiation of transforming growth factor β 1-induced mesenchymal stem cells into nucleus pulposus-like cells under simulated microgravity conditions.

Han C, Jiang C, Yu C, Shen H. *Cell Mol Biol (Noisy-le-grand)*. 2015 May 16;61(2):50-5.

Increased proliferation and adhesion properties of human dental pulp stem cells in PLGA scaffolds via simulated microgravity.

He L, Pan S, Li Y, Zhang W, Yi H, Song C, Niu Y. *Int. Endod J*. 2015 Feb 19. doi: 10.1111/iej.12441.

The effects of spheroid formation of adipose-derived stem cells in a microgravity bioreactor on stemness properties and therapeutic potential.

Zhang S, Liu P, Chen L, Wang Y, Wang Z, Zhang B. *Biomaterials*. 2015 Feb;41:15-25. doi: 10.1016/j.biomaterials.2014.11.019. Epub 2014 Dec 1.

Dai Y, Guo Y, Wang C, Liu Q, Yang Y, Li S, Guo X, Lian R, Yu R, Liu H, Chen J. **Non-genetic direct reprogramming and biomimetic platforms in a preliminary study for adipose-derived stem cells into corneal endothelia-like cells.** *PLoS One*. 2014 Oct 15;9(10):e109856. doi:10.1371/journal.pone.0109856.

Kang H, Lu S, Peng J, Yang Q, Liu S, Zhang L, Huang J, Sui X, Zhao B, Wang A, Xu W, Guo Q, Song Q. **Chondrogenic differentiation of human adipose derived stem cells using microcarrier and bioreactor combination technique.** *Mol Med Rep.* 2014 Oct 30. doi: 10.3892/mmr.2014.2820.

Vecchiatini R, Penolazzi L, Lambertini E, Angelozzi M, Morganti C, Mazzitelli S, Trombelli L, Nastruzzi C, Piva R. **Effect of dynamic three-dimensional culture on osteogenic potential of human periodontal ligament-derived mesenchymal stem cells entrapped in alginate microbeads.** *J Periodontal Res.* 2014 Sep 23. doi: 10.1111/jre.12225.

The impact of simulated and real microgravity on bone cells and mesenchymal stem cells

Ulbrich C, Wehland M, Pietsch J, Aleshcheva G, Wise P, van Loon J, Magnusson N, Infanger M, Grosse J, Eilles C, Sundaresan A, Grimm D. *Biomed Res Int.* 2014;2014:928507. doi: 10.1155/2014/928507.

Luo H, Zhu B, Zhang Y, Jin Y. **Tissue-Engineered Nerve Constructs Under a Microgravity System for Peripheral Nerve Regeneration.** *Tissue Eng Part A.* 2014 Sep 16. (Epub ahead of print)

Teo A, Mantalaris A, Song K, Lim M **A novel perfused rotary bioreactor for cardiomyogenesis of embryonic stem cells.** *Biotechnol Lett.* 2014 May;36(5):947-60. doi:10.1007/s10529-014-1456-y.

Fauzi I, Panoskaltsis N, Mantalaris A. **Early exposure of murine embryonic stem cells to hematopoietic cytokines differentially directs definitive erythropoiesis and cardiomyogenesis in alginate hydrogel three-dimensional cultures.** *Stem Cells Dev.* 2014 Jun 13. (Epub ahead of print)

Lei X, Deng Z, Zhang H, Zhao H, Zhou J, Liu S, Chen Q, Ning L, Cao Y, Wang X, Zhang X, Duan E. **Rotary Suspension Culture Enhances Mesendoderm Differentiation of Embryonic Stem Cells Through Modulation of Wnt/ β -catenin Pathway.** *Stem Cell Rev.* 2014 May 4. (Epub ahead of print)

Zhang S, Zhang Y, Chen L, Liu T, Li Y, Wang Y, Geng Y. **Efficient large-scale generation of functional hepatocytes from mouse embryonic stem cells grown in a rotating bioreactor with exogenous growth factors and hormones.** *Stem Cell Res Ther.* 2013 Dec 2;4(6):145.

Rungarunlert S, Klincumhom N, Tharasanit T, Techakumphu M, Purity MK, Dinnyes A. **Slow turning lateral vessel bioreactor improves embryoid body formation and cardiogenic differentiation of mouse embryonic stem cells.** *Cell Reprogram.* 2013 Oct;15(5):443-58. doi: 10.1089/cell.2012.0082.

Lv Q, Deng M, Ulery BD, Nair LS, Laurencin CT. **Nano-ceramic composite scaffolds for bioreactor-based bone engineering.** *Clin Orthop Relat Res.* 2013 Aug;471(8):2422-33. doi: 10.1007/s11999-013-2859-0.

Sung SY, Liao CH, Wu HP, Hsiao WC, Wu IH, Jinpu, Yu, Lin SH, Hsieh CL. **Loss of Let-7 MicroRNA Upregulates IL-6 in Bone Marrow-Derived Mesenchymal Stem Cells Triggering a Reactive Stromal Response to Prostate Cancer.** *PLoS One.* 2013 Aug 19;8(8):e71637. doi: 10.1371/journal.pone.0071637.

Liu S, Hou KD, Yuan M, Peng J, Zhang L, Sui X, Zhao B, Xu W, Wang A, Lu S, Guo Q. **Characteristics of mesenchymal stem cells derived from Wharton's jelly of human umbilical cord and for fabrication of non-scaffold tissue-engineered cartilage.** *J Biosci Bioeng.* 2013 Jul 27. pii: S1389-1723(13)00263-6. doi: 10.1016/j.jbiosc.2013.07.001.

Wu X, Li SH, Lou LM, Chen ZR. **The effect of the microgravity rotating culture system on the chondrogenic differentiation of bone marrow mesenchymal stem cells.** *Mol Biotechnol.* 2013 Jun;54(2):331-6. doi: 10.1007/s12033-012-9568-x.(1)

Wang N, Wang H, Chen J, Zhang X, Xie J, Li Z, Ma J, Wang W, Wang Z. **The simulated microgravity enhances multipotential differentiation capacity of bone marrow mesenchymal stem cells.** *Cytotechnology.* 2013 Apr 12.

Nishi M, Matsumoto R, Dong J, Uemura T. **Engineered bone tissue associated with vascularization utilizing a rotating wall vessel bioreactor.** *J Biomed Mater Res A.* 2012 Aug 3. doi: 10.1002/jbm.a.34340

Yuan Y, Sin WY, Xue B, Ke Y, Tse KT, Chen Z, Xie Y, Xie Y. **Novel alginate three-dimensional static and rotating culture systems for effective ex vivo amplification of human cord blood hematopoietic stem cells and**

in vivo functional analysis of amplified cells in NOD/SCID mice. *Transfusion.* 2013 Feb 5. doi: 10.1111/trf.12103.

Dai Y, Chen J, Li H, Li S, Chen J, Ding Y, Wu J, Wang C, Tan M. **Characterizing the Effects of VPA, VC and RCCS on Rabbit Keratocytes onto Decellularized Bovine Cornea.** *PLoS One.* 2012;7(11):e50114. doi: 10.1371/journal.pone.0050114.

Gabriel E, Schievenbusch S, Kolossov E, Hengstler JG, Rotshteyn T, Bohlen H, Nierhoff D, Hescheler J, Drobninskaya I. **Differentiation and selection of hepatocyte precursors in suspension spheroid culture of transgenic murine embryonic stem cells.** *PLoS One.* 2012;7(9):e44912. doi: 10.1371/journal.pone.0044912.

Cerwinka WH, Sharp SM, Boyan BD, Zhau HE, Chung LWK, Yates C; **Differentiation of human mesenchymal stem cell spheroids under microgravity conditions.** *Cell Regeneration* 2012, 1:2

Li Y, Li S, Niu ZY, Bao B, Shi X. **The effect of Smads signal pathway on the osteogenesis of human periodontal ligament stem cells in simulated microgravity.** *Shanghai Kou Qiang Yi Xue.* 2012 Jun; 21(3):246-50. (Abstract in English, Article in Chinese)

Wang Y, Zhang Y, Zhang S, Peng G, Liu T, Li Y, Xiang D, Wassler MJ, Shelat HS, Geng Y. **Rotating microgravity-bioreactor cultivation enhances the hepatic differentiation of mouse embryonic stem cells on biodegradable polymer scaffolds.** *Tissue Eng Part A.* 2012 Sep 24. (epublication ahead of print)

Takebe T, Kobayashi S, Kan H, Suzuki H, Yabuki Y, Mizuno M, Adegawa T, Yoshioka T, Tanaka J, Maegawa J, Taniguchi H. **Human elastic cartilage engineering from cartilage progenitor cells using rotating wall vessel bioreactor.** *Transplant Proc.* 2012 May;44(4):1158-61.

Puca A, Russo G, Giordano A. **Properties of mechano-transduction via simulated microgravity and its effects on intracellular trafficking of VEGFR's.** *Oncotarget.* 2012 Apr;3(4):426-34.

Chiang MC, Lin H, Cheng YC, Yen CH, Huang RN, Lin KH. **Beta-adrenoceptor pathway enhances mitochondrial function in human neural stem cells via rotary cell culture system.** *J Neurosci Methods.* 2012 Jun 15;207(2):130-6. Epub 2012 Apr 13

Shi J, Zhang X, Zeng X, Zhu J, Pi Y, Zhou C, Ao Y. **One-step articular cartilage repair: combination of in situ bone marrow stem cells with cell-free poly(L-lactic-co-glycolic acid) scaffold in a rabbit model.** *Orthopedics.* 2012 May;35(5):e665-71. doi: 10.3928/01477447-20120426-20.

Weszl M, Skaliczki G, Cselenyák A, Kiss L, Major T, Schandl K, Bognár E, Stadler G, Peterbauer A, Csöngé L. **Freeze-dried human serum albumin improves the adherence and proliferation of mesenchymal stem cells on mineralized human bone allografts.** *J Orthop Res.* 2012 Mar;30(3):489-96.

Hoz L, Romo E, Zeichner-David M, Sanz M, Nuñez J, Gaitán L, Mercado G, Arzate H., **Cementum protein 1 (CEMP1) induces differentiation by human periodontal ligament cells under three-dimensional culture conditions.** *Cell Biol Int.* 2012 Feb 1;36(2):129-36.

Lei XH, Ning LN, Cao YJ, Liu S, Zhang SB, Qiu ZF, Hu HM, Zhang HS, Liu S, Duan EK. **NASA-Approved Rotary Bioreactor Enhances Proliferation of Human Epidermal Stem Cells and Supports Formation of 3D Epidermis-Like Structure.** *PLoS One.* 6(11):e26603; Nov 2011

Ismail S, Samadikuchaksaraei A, Bishop A, Polak JM, Mantalaris A. **Development of a novel three-dimensional, automatable and integrated bioprocess for the differentiation of embryonic stem cells into pulmonary alveolar cells in a rotating vessel bioreactor system.** *Tissue Eng Part C Methods.* Epub Nov 2011

Chen J, Liu R, Yang Y, Li J, Zhang X, Li J, Wang Z, Ma J. **The simulated microgravity enhances the differentiation of mesenchymal stem cells into neurons.** *Neurosci Lett.*;505(2):171-5. Nov 2011

Yu B, Yu D, Cao L, Zhao X, Long T, Liu G, Tang T, Zhu Z. **Simulated microgravity using a rotary cell culture system promotes chondrogenesis of human adipose-derived mesenchymal stem cells via the p38 MAPK pathway.** *Biochem Biophys Res Commun.*;414(2):412-8 Oct 2011

Ji SZ, Xiao SC, Luo PF, Huang GF, Wang GY, Zhu SH, Wu MJ, Xia ZF. **An epidermal stem cells niche microenvironment created by engineered human amniotic membrane.** *Biomaterials.*;32(31):7801-11, Nov 2011

Rungarunlert S, Klincumhom N, Bock I, Nemes C, Techakumphu M, Purity MK, Dinnyes A. **Enhanced cardiac differentiation of mouse embryonic stem cells by use of the slow-turning, lateral vessel (STLV) bioreactor.** *Biotechnol Lett.* 2011 Aug;33(8):1565-73, 2011

Ishikawa M, Sekine K, Okamura A, Zheng YW, Ueno Y, Koike N, Tanaka J, Taniguchi H. **Reconstitution of hepatic tissue architectures from fetal liver cells obtained from a three-dimensional culture with a rotating wall vessel bioreactor.** *J Biosci Bioeng.* 111(6):711-8. June 2011

Consolo F, Bariani C, Mantalaris A, Montevecchi F, Redaelli A, Morbiducci U. **Computational modeling for the optimization of a cardiogenic 3D bioprocess of encapsulated embryonic stem cells.** *Biomech Model Mechanobiol.*, Apr 2011

Sheehy EJ, Buckley CT, Kelly DJ., **Chondrocytes and bone marrow-derived mesenchymal stem cells undergoing chondrogenesis in agarose hydrogels of solid and channelled architectures respond differentially to dynamic culture conditions.** *J Tissue Eng Regen Med.* Epub Jan 2011

Sheyn D, Pelled G, Netanel D, Domany E, Gazit D. **The effect of simulated microgravity on human mesenchymal stem cells cultured in an osteogenic differentiation system: a bioinformatics study.** *Tissue Eng Part A.* 16(11):3403-12, 2010

Kedong S, Xiubo F, Tianqing L, Macedo HM, LiLi J, Meiyun F, Fangxin S, Xuehu M, Zhanfeng C, **Simultaneous expansion and harvest of hematopoietic stem cells and mesenchymal stem cells derived from umbilical cord blood.** *J Mater Sci Mater Med.* 21(12):3183-93, 2010

Cortiella J, Niles J, Cantu A, Brettler A, Pham A, Vargas G, Winston S, Wang J, Walls S, Nichols JE. **Influence of acellular natural lung matrix on murine embryonic stem cell differentiation and tissue formation.** *Tissue Eng Part A.* 2010 Aug;16(8):2565-80

Fridley KM, Fernandez I, Li MT, Kettlewell RB, Roy K. **Unique Differentiation Profile of Mouse Embryonic Stem Cells in Rotary and Stirred Tank Bioreactors.** *Tissue Eng Part A.* 16: 3285-3298, 2010

Li S, Ma Z, Niu Z, Qian H, Xuan D, Hou R, Ni L. **NASA approved rotary bioreactor enhances proliferation and osteogenesis of human periodontal ligament stem cells.** *Stem Cells Dev.* 18:1273-82, 2009

Hwang YS, Cho J, Tay F, Heng JY, Ho R, Kazarian SG, Williams DR, Boccaccini AR, Polak JM, Mantalaris A. **The use of murine embryonic stem cells, alginate encapsulation, and rotary microgravity bioreactor in bone tissue engineering.** *Biomaterials* 30: 499-507, 2008

Ma W, Tavakoli T, Chen S, Maric D, Liu JL, O'Shaughnessy TJ. **Reconstruction of Functional Cortical-Like Tissues from Neural Stem and Progenitor Cells.** *Tissue Eng Part A* 14: 1687-1697, 2008

Come J, Nissan X, Aubry L, Tournois J, Girard M, Perrier AL, Peschanski M, Cailleret M. **Improvement of culture conditions of human embryoid bodies using a controlled perfused and dialyzed bioreactor system.** *Tissue Eng Part C Methods* 14: 289-298, 2008

Pei M, He F, Kish VL, Vunjak-Novakovic G. **Engineering of Functional Cartilage Tissue Using Stem Cells from Synovial Lining: A Preliminary Study.** *Clin Orthop Relat Res* 466: 1880-1889, 2008

Randle WL, Cha JM, Hwang YS, Chan KL, Kazarian SG, Polak JM, Mantalaris A. **Integrated 3-Dimensional Expansion and Osteogenic Differentiation of Murine Embryonic Stem Cells.** *Tissue Eng* 13: 2957-2970, 2007

- Chen SS, Fitzgerald W, Zimmerberg J, Kleinman HK, Margolis L. **Cell-cell and cell-extracellular matrix interactions regulate embryonic stem cell differentiation.** *Stem Cells* 25: 553-561, 2007
- McGuckin C, Forraz N, Baradez MO, Basford C, Dickinson AM, Navran S, Hartgerink JD. **Embryonic-like stem cells from umbilical cord blood and potential for neural modeling.** *Acta Neurobiol* 66: 321-329, 2006
- Guo XM, Zhao YS, Chang HX, Wang CY, Ling-Ling E, Zhang XA, Duan CM, Dong LZ, Jiang H, Li J, Song Y, Yang XJ. **Creation of engineered cardiac tissue in vitro from mouse embryonic stem cells.** *Circulation* 113 :2229-2237, 2006.
- Chen X, Xu H, Wan C, McCaigue M, Li G. **Bioreactor Expansion of Human Bone Marrow Mesenchymal Stem Cells.** *Stem Cells* 24: 2052-2059, 2006
- McGuckin CP, Forraz N, Baradez MO, Navran S, Zhao J, Urban R, Tilton R, Denner L: **Production of stem cells with embryonic characteristics from human umbilical cord blood.** *Cell Prolif* 38: 245-255, 2005.
- Wang XL, Wang CY, Yu XJ, Zhao YS, Li J, Duan CM, Guo XM: **Scalable production of embryoid bodies with the rotary cell culture system.** *Sheng Li Xue Bao.* 57:486-492, 2005. (Article in Chinese)
- Meyers VE, Zayzafoon M, Gonda SR, Gathings WE, McDonald JM: **Modeled Microgravity Disrupts Collagen I/integrin Signaling During Osteoblastic Differentiation of Human Mesenchymal Stem Cells.** *J Cell Biochem.* 93: 697-707, 2004.
- Philp D, Chen SS, Fitzgerald W, Orenstein J, Margolis L, Kleinman HK: **Complex Extracellular Matrices Promote Tissue-specific Stem Cell Differentiation.** *Stem Cells* 23: 288-296, 2005.
- Lu S, Liu S, He W, Duan C, Li Y, Liu Z, Hao T, Wang Y, Li D, Wang C, Gao S. **Bioreactor Cultivation Enhances NTEB Formation and Differentiation of NTES Cells into Cardiomyocytes.** *Cloning Stem Cells* 10:363-370, 2008
- Lin HJ, O'Shaughnessy TJ, Kelly J, Ma W: **Neural Stem Cell Differentiation in a Cell-collagen-bioreactor Culture System.** *Dev Brain Res.* 153: 163-173, 2004.
- Gerecht-Nir S, Cohen S, Itskovitz-Eldor J: **Bioreactor Cultivation Enhances the Efficiency of Human Embryoid Body (hEB) Formation and Differentiation.** *Biotechnology and Bioengineering* : 86: 493-502, 2004.
- Zayzafoon M, Gathings WE, McDonald JM: **Modeled Microgravity Inhibits Osteogenic Differentiation of Human Mesenchymal Stem Cells and Increases Adipogenesis.** *Endocrinology:* 145 2421-2432, 2004.
- Colvin GA, Lambert JF, Carlson JE, McAuliffe CI, Abedi M, Quesenberry PJ: **Rhythmicity of Engraftment and Altered Cell Cycle Kinetics of Cytokine-Cultured Murine Marrow in Simulated Microgravity Compared With Static Cultures:** *In Vitro Cell Dev Bio Anim* 38: 343-351, 2002.

TISSUE ENGINEERING

Human three-dimensional endometrial epithelial cell model to study host interactions with vaginal bacteria and Neisseria gonorrhoeae.

Łaniewski P, Gomez A, Hire G, So M, Herbst-Kralovetz MM. *Infect Immun.* 2017 Jan 4. pii: IAI.01049-16. doi: 10.1128/IAI.01049-16.

Effect of Rotation on Scaffold Motion and Cell Growth in Rotating Bioreactors.

Varley MC, Markaki AE, Brooks RA. *Tissue Eng Part A.* 2017 Jan 26. doi: 10.1089/ten.TEA.2016.0357.

Three-dimensional simulated microgravity culture improves the proliferation and odontogenic differentiation of dental pulp stem cell in PLGA scaffolds implanted in mice.

Li Y, He L, Pan S, Zhang L, Zhang W, Yi H, Niu Y. Mol Med Rep. 2017 Feb;15(2):873-878. doi: 10.3892/mmr.2016.6042.

Generating mechanically stable, pediatric, and scaffold-free nasal cartilage constructs in vitro

Akbari P, Waldman SD, Propst E, Cushing SL, Weber JF, Yeger H, Farhat WA. Tissue Eng Part C Methods. 2016 Nov 9.

Three-Dimensional Rotating Wall Vessel-Derived Cell Culture Models for Studying Virus-Host Interactions.

Gardner JK, Herbst-Kralovetz MM. Viruses. 2016 Nov 9;8(11). pii: E304.

Engineering three dimensional micro nerve tissue using postnatal stem cells from human dental apical papilla.

Kim BC, Jun SM, Kim SY, Kwon YD, Choe SC, Kim EC, Lee JH, Kim J, Suh JF, Hwang YS. Biotechnol Bioeng. 2016 Oct 24. doi: 10.1002/bit.26205.

Development of a Three-Dimensional Bioengineering Technology to Generate Lung Tissue for Personalized Disease Modeling.

Wilkinson DC, Alva-Ornelas JA, Sucre JM, Vijayaraj P, Durra A, Richardson W, Jonas SJ, Paul MK, Karumbayaram S, Dunn B, Gomperts BN. Stem Cells Transl Med. 2016 Sep 15. pii: sctm.2016-0192.

IL-36 γ Augments Host Defense and Immune Responses in Human Female Reproductive Tract Epithelial Cells

Sean M. Winkle, Andrea L. Throop and Melissa M. Herbst-Kralovetz. Front. Microbiol., 17 June 2016
<http://dx.doi.org/10.3389/fmicb.2016.00955>

Uniform Embryoid Body Production and Enhanced Mesendoderm Differentiation with Murine Embryonic Stem Cells in a Rotary Suspension Bioreactor.

Lei X, Deng Z, Duan E. Methods Mol Biol. 2016 Apr 27.

Novel Bioreactor Platform for Scalable Cardiomyogenic Differentiation from Pluripotent Stem Cell-Derived Embryoid Bodies.

Rungarunlert S, Ferreira JN, Dinnyes A. Methods Mol Biol. 2016 Apr 5

Establishment of a 3D-dynamic osteoblasts-osteoclasts co-culture model to simulate the jawbone microenvironment in vitro.

Penolazzi L, Lolli A, Sardelli L, Angelozzi M, Lambertini E, Trombelli L, Ciarpella F, RenataVecchiatini, Piva R. Life Sci. 2016 Mar 22. pii: S0024-3205(16)30151-5. doi: 10.1016/j.lfs.2016.03.035.

Decellularized Extracellular Matrix Microparticles as a Vehicle for Cellular Delivery in a Model of Anastomosis Healinga.

Hoganson DM, Owens GE, Meppelink AM, Bassett EK, Bowley CM, Hinkel CJ, Finkelstein EB, Goldman SM, Vacanti JP. J Biomed Mater Res A. 2016 Mar 4. doi: 10.1002/jbm.a.35703.

Pediatric laryngotracheal reconstruction with tissue-engineered cartilage in a rabbit model.

Jacobs IN, Redden RA, Goldberg R, Hast M, Salowe R, Mauck RL, Doolin EJ. Laryngoscope. 2016 Jan;126 Suppl 1:S5-21. doi: 10.1002/lary.25676.

Acceleration of diabetic wound healing by a cryopreserved living dermal substitute created by micronized amnion seeded with fibroblasts.

Zheng Y, Ji S, Wu H, Tian S, Wang X, Luo P, Fang H, Wang Z, Wang J, Wang Z, Xiao S, Xia Z. Am J Transl Res. 2015 Dec 15;7(12):2683-93. eCollection 2015.

Induction of mesenchymal stem cell chondrogenic differentiation and functional cartilage microtissue formation for in vivo cartilage regeneration by cartilage extracellular matrix-derived particles.

Yin H, Wang Y, Sun Z, Sun X, Xu Y, Li P, Meng H, Yu X, Xiao B, Fan T, Wang Y, Xu W, Wang A, Guo Q, Peng J, Lu S. Acta Biomater. 2016 Jan 20. pii: S1742-7061(16)30024-1. doi: 10.1016/j.actbio.2016.01.024.

Hetero-cellular prototyping by synchronized multi-material bioprinting for rotary cell culture system.
Snyder J1, Son AR, Hamid Q, Wu H, Sun W. *Biofabrication*. 2016 Jan 13;8(1):015002.

Microgravity as a means to incorporate HepG2 aggregates in polysaccharide-protein hybrid scaffold.
Sarika PR, James NR, Anilkumar PR, Raj DK, Kumary TV. *J Mater Sci Mater Med*. 2016 Feb;27(2):27. doi: 10.1007/s10856-015-5638-5.

Hypoxia Created Human Mesenchymal Stem Cell Sheet for Prevascularized 3D Tissue Construction.
Zhang L, Xing Q, Qian Z, Tahtinen M, Zhang Z, Shearier E, Qi S, Zhao F. *Adv Healthc Mater*. 2015 Dec 14. doi: 10.1002/adhm.2

Scaffold-free and scaffold-assisted 3D culture enhances differentiation of bone marrow stromal cells.
Vidyasekar P, Shyamsunder P, Sahoo SK, Verma RS, *In Vitro Cell Dev Biol Anim*. 2015 Nov 5.

Scaffold-free, Human Mesenchymal Stem Cell-Based Tissue Engineered Blood Vessels.
Jung Y, Ji H, Chen Z, Fai Chan H, Atchison L, Klitzman B, Truskey G, Leong KW. *Sci Rep*. 2015 Oct 12;5:15116. doi: 10.1038/srep15116.

Effect of Culture in Simulated Microgravity on the Development of Mouse Embryonic Testes.
Nowacki D, Klinger FG, Mazur G, Felici MD. *Adv Clin Exp Med*. 2015 Sep-Oct;24(5):769-74. doi: 10.17219/acem/27920.

Endothelial-like malignant glioma cells in dynamic three dimensional culture identifies a role for VEGF and FGFR in a tumor-derived angiogenic response.
Smith SJ, Ward JH, Tan C, Grundy RG, Rahman R. *Oncotarget*. 2015 Jun 2.

Differentiation of transforming growth factor β 1-induced mesenchymal stem cells into nucleus pulposus-like cells under simulated microgravity conditions.
Han C, Jiang C, Yu C, Shen H. *Cell Mol Biol (Noisy-le-grand)*. 2015 May 16;61(2):50-5.

3D tissue-like assemblies: A novel approach to investigate virus-cell interactions.
Goodwin TJ, McCarthy M, Cohrs RJ, Kaufer BB. *Methods*. 2015 May 15. pii: S1046-2023(15)00203-0. doi: 10.1016/j.ymeth.2015.05.010.

Recellularization of decellularized lung scaffolds is enhanced by dynamic suspension culture.
Crabbé A1, Liu Y1, Sarker SF1, Bonenfant NR2, Barrila J1, Borg ZD2, Lee JJ3, Weiss DJ2, Nickerson CA4. *PLoS One*. 2015 May 11;10(5):e0126846. doi: 10.1371/journal.pone.0126846. eCollection 2015.

Use of amniotic microparticles coated with fibroblasts overexpressing SDF-1 α to create an environment conducive to neovascularization for repair of full-thickness skin defects
Zhang YQ, Ju SZ, Fang H, Zheng YJ, Luo PF, Wu HB, Wu MJ, Wang ZH, Xiao SC, Xia ZF. *Cell Transplant*. 2015 April 7; doi:10.3727/096368915X687930

3D culture of isolated cells: A fast and efficient method for optimising their histochemical and immunocytochemical analyses.
Berenzi A, Steimberg N, Boniotti J, Mazzoleni G. *Microsc Res Tech*. 2015 Jan 29. doi:10.1002/jemt.22470

RCCS Bioreactor-Based Modelled Microgravity Induces Significant Changes on In Vitro 3D Neuroglial Cell Cultures.
Morabito C, Steimberg N, Mazzoleni G, Guarnieri S, Fano-Illic G, Mariggio MA. *Biomed Res Int*. 2015 Jan 13; 2015:754283. doi 10.1155/2015/754283

Establishment of a rotary aerobic culture system for in vitro culture of mouse testis.

Liu Y, Zhu YF, Gao ZB, Li M, Zhong LY, Yin DJ, Li Y, Nan Fang Yi Ke Da Xue Xue Bao. 2015 Jan 20;35(1):66-71 [Article in Chinese]

Increased proliferation and adhesion properties of human dental pulp stem cells in PLGA scaffolds via simulated microgravity.

He L, Pan S, Li Y, Zhang W, Yi H, Song C, Niu Y. *Int. Endod J.* 2015 Feb 19. doi: 10.1111/iej.12441.

A mesoscale study of the degradation of bone structural properties in modeled microgravity conditions.

Cosmi F, Steimberg N, Mazzoleni G. *J Mech Behav Biomed Mater.* 2015 Jan 12;44C:61-70. doi: 10.1016/j.jmbbm.2015.01.002

Liver-Tumor Hybrid Organoids for Modeling Tumor Growth and Drug Response In Vitro.

Skardal A, Devarasetty M, Rodman C, Atala A, Soker S. *AnnBiomed Eng.* 2015 Mar 17. doi: 10.1007/s10439-015-1298-3

Generation of Bioartificial Salivary Gland Using Whole-Organ Decellularized Bioscaffold

Gao Z, Wu T, Xu J, Liu G, Xie Y, Zhang C, Wang J, Wang S. *Cells Tissues Organs.* 2015 March 25; doi:10.00.1159/00371873

Optimal 3D culture of primary articular chondrocytes for use in the rotating wall vessel bioreactor.

Mellor LF, Baker TL, Brown RJ, Catlin LW, Oxford JT. *Aviat Space Environ Med.* 2014 Aug;85(8):798-804. doi: 10.3357/ASEM.3905.2014.

Luo H, Zhu B, Zhang Y, Jin Y. Tissue-Engineered Nerve Constructs Under a Microgravity System for Peripheral Nerve Regeneration. *Tissue Eng Part A.* 2014 Sep 16. (Epub ahead of print)

Montani C, Steimberg N, Boniotti J, Biasiotto G, Zanella I, Diafera G, Biunno I, Caimi L, Mazzoleni G, Di Lorenzo D. **Fibroblasts maintained in 3 dimensions show a better differentiation state and higher sensitivity to estrogens.** *Toxicol Appl Pharmacol.* 2014 Aug 28. pii: S0041-008X(14)00313-5. doi: 10.1016/j.taap.2014.08.021.

Bacteria in the vaginal microbiome alter the innate immune response and barrier properties of the human vaginal epithelia in a species-specific manner.

Doerflinger SY1, Throop AL2, Herbst-Kralovetz MM2. *J Infect Dis.* 2014 Jun 15;209(12):1989-99. doi: 10.1093/infdis/jiu004. Epub 2014 Jan 7.

Teo A, Mantalaris A, Song K, Lim M A novel perfused rotary bioreactor for cardiomyogenesis of embryonic stem cells. *Biotechnol Lett.* 2014 May;36(5):947-60. doi:10.1007/s10529-014-1456-y.

Grimm D, Wehland M, Pietsch J, Aleshcheva G, Wise P, van Loon J, Ulbrich C, Magnusson NE, Infanger M, Bauer J. **Growing tissues in real and simulated microgravity - new methods for tissue engineering.** *Tissue Eng Part B Rev.* 2014 Mar 5. (Epub ahead of print)

Warnock JJ, Fox DB, Stoker AM, Beatty M, Cockrell M, Janicek JC, Cook JL. **Culture of equine fibroblast-like synoviocytes on synthetic tissue scaffolds towards meniscal tissue engineering: a preliminary cell-seeding study.** *PeerJ.* 2014 Apr 17;2:e353. doi: 10.7717/peerj.353. eCollection 2014.

Rungarunlert S, Klincumhom N, Tharasanit T, Techakumphu M, Purity MK, Dinnyes A. **Slow turning lateral vessel bioreactor improves embryoid body formation and cardiogenic differentiation of mouse embryonic stem cells.** *Cell Reprogram.* 2013 Oct;15(5):443-58. doi: 10.1089/cell.2012.0082.

Lv Q, Deng M, Ulery BD, Nair LS, Laurencin CT. **Nano-ceramic composite scaffolds for bioreactor-based bone engineering.** *Clin Orthop Relat Res.* 2013 Aug;471(8):2422-33. doi: 10.1007/s11999-013-2859-0.

Sun L, Yang C, Ge Y, Yu M, Chen G, Guo W, Tian W. **In vitro three-dimensional development of mouse molar tooth germs in a rotary cell culture system.** *Int J Paediatr Dent.* 2013 Jul 19. doi: 10.1111/ipd.12057.

Mycoplasma genitalium infection activates cellular host defense and inflammation pathways in a 3-dimensional human endocervical epithelial cell model.

McGowin CL, Radtke AL, Abraham K, Martin DH, Herbst-Kralovetz M.
J Infect Dis. 2013 Jun 15;207(12):1857-68. doi: 10.1093/infdis/jit101. Epub 2013 Mar 14.

Tanaka H, Tanaka S, Sekine K, Kita S, Okamura A, Takebe T, Zheng YW, Ueno Y, Tanaka J, Taniguchi H. **The generation of pancreatic β -cell spheroids in a simulated microgravity culture system.** *Biomaterials.* 2013 Jul;34(23):5785-91. doi: 10.1016/j.biomaterials.2013.04.003.

Wu X, Li SH, Lou LM, Chen ZR. **The effect of the microgravity rotating culture system on the chondrogenic differentiation of bone marrow mesenchymal stem cells.** *Mol Biotechnol.* 2013 Jun;54(2):331-6. doi: 10.1007/s12033-012-9568-x.(1)

Wang N, Wang H, Chen J, Zhang X, Xie J, Li Z, Ma J, Wang W, Wang Z. **The simulated microgravity enhances multipotential differentiation capacity of bone marrow mesenchymal stem cells.** *Cytotechnology.* 2013 Apr 12.

Yuan Y, Sin WY, Xue B, Ke Y, Tse KT, Chen Z, Xie Y, Xie Y. **Novel alginate three-dimensional static and rotating culture systems for effective ex vivo amplification of human cord blood hematopoietic stem cells and in vivo functional analysis of amplified cells in NOD/SCID mice.** *Transfusion.* 2013 Feb 5. doi: 10.1111/trf.12103.

Dai Y, Chen J, Li H, Li S, Chen J, Ding Y, Wu J, Wang C, Tan M. **Characterizing the Effects of VPA, VC and RCCS on Rabbit Keratocytes onto Decellularized Bovine Cornea.** *PLoS One.* 2012;7(11):e50114. doi: 10.1371/journal.pone.0050114.

Gaspar DA, Gomide V, Monteiro FJ. **The role of perfusion bioreactors in bone tissue engineering.** *Biomatter.* 2012 Oct 1;2(4):167-75. doi: 10.4161/biom.22170.

Gabriel E, Schievenbusch S, Kolossov E, Hengstler JG, Rotshteyn T, Bohlen H, Nierhoff D, Hescheler J, Drobinskaya I. **Differentiation and selection of hepatocyte precursors in suspension spheroid culture of transgenic murine embryonic stem cells.** *PLoS One.* 2012;7(9):e44912. doi: 10.1371/journal.pone.0044912.

Microbial products alter the expression of membrane-associated mucin and antimicrobial peptides in a three-dimensional human endocervical epithelial cell model.

Radtke AL, Quayle AJ, Herbst-Kralovetz MM. *Biol Reprod.* 2012 Dec 6;87(6):132. doi: 10.1095/biolreprod.112.103366. Print 2012 Jun.

Song K, Wang H, Zhang B, Lim M, Liu Y, Liu T; **Numerical simulation of fluid field and in vitro three-dimensional fabrication of tissue-engineered bones in a rotating bioreactor and in vivo implantation for repairing segmental bone defects.** *Cell Stress Chaperones.* 2012 Oct 5. [Epub ahead of print]

Nishi M, Matsumoto R, Dong J, Uemura T. **Engineered bone tissue associated with vascularization utilizing a rotating wall vessel bioreactor.** *J Biomed Mater Res A.* 2012 Aug 3. doi: 10.1002/jbm.a.34340
Cerwinka WH, Sharp SM, Boyan BD, Zhou HE, Chung LWK, Yates C; **Differentiation of human mesenchymal stem cell spheroids under microgravity conditions.** *Cell Regeneration* 2012, 1:2

Wang Y, Zhang Y, Zhang S, Peng G, Liu T, Li Y, Xiang D, Wassler MJ, Shelat HS, Geng Y. **Rotating microgravity-bioreactor cultivation enhances the hepatic differentiation of mouse embryonic stem cells on biodegradable polymer scaffolds.** *Tissue Eng Part A.* 2012 Sep 24. (epublication ahead of print)

Wang B, Tedder ME, Perez CE, Wang G, de Jongh Curry AL, To F, Elder SH, Williams LN, Simionescu DT, Liao J. **Structural and biomechanical characterizations of porcine myocardial extracellular matrix.** *J Mater Sci Mater Med.* 2012 May 15

Takebe T, Kobayashi S, Kan H, Suzuki H, Yabuki Y, Mizuno M, Adegawa T, Yoshioka T, Tanaka J, Maegawa J, Taniguchi H. **Human elastic cartilage engineering from cartilage progenitor cells using rotating wall vessel bioreactor.** *Transplant Proc.* 2012 May; 44(4):1158-61.

Lei XH, Ning LN, Cao YJ, Liu S, Zhang SB, Qiu ZF, Hu HM, Zhang HS, Liu S, Duan EK. **NASA-Approved Rotary Bioreactor Enhances Proliferation of Human Epidermal Stem Cells and Supports Formation of 3D Epidermis-Like Structure.** *PLoS One.* 6(11):e26603; Nov 2011

Ismail S, Samadikuchaksaraei A, Bishop A, Polak JM, Mantalaris A. **Development of a novel three-dimensional, automatable and integrated bioprocess for the differentiation of embryonic stem cells into pulmonary alveolar cells in a rotating vessel bioreactor system.** *Tissue Eng Part C Methods.* Epub Nov 2011

Chen J, Liu R, Yang Y, Li J, Zhang X, Li J, Wang Z, Ma J. **The simulated microgravity enhances the differentiation of mesenchymal stem cells into neurons.** *Neurosci Lett.*;505(2):171-5. Nov 2011

Rotational co-culture of clonal β -cells with endothelial cells: effect of PPAR- γ agonism in vitro on insulin and VEGF secretion.

Paget MB1, Murray HE, Bailey CJ, Flatt PR, Downing R. *Diabetes Obes Metab.* 2011 Jul;13(7):662-8. doi: 10.1111/j.1463-1326.2011.01392.x.

Cartmell SH, Rathbone S, Jones G, Hidalgo-Bastida LA. **3D sample preparation for orthopaedic tissue engineering bioreactors.** (Book chapter in *3D Cell Culture: Methods and Protocols*, ISBN 978-1-60761-983-3)

Rauh J, Milan F, Günther KP, Stiehler M. **Bioreactor systems for bone tissue engineering.** *Tissue Eng Part B Rev.* 2011 Aug;17(4):263-80.

Ji SZ, Xiao SC, Luo PF, Huang GF, Wang GY, Zhu SH, Wu MJ, Xia ZF. **An epidermal stem cells niche microenvironment created by engineered human amniotic membrane.** *Biomaterials.*;32(31):7801-11, Nov 2011

Rungarunlert S, Klincumhom N, Bock I, Nemes C, Techakumphu M, Purity MK, Dinnyes A. **Enhanced cardiac differentiation of mouse embryonic stem cells by use of the slow-turning, lateral vessel (STLV) bioreactor.** *Biotechnol Lett.* 2011 Aug;33(8):1565-73, 2011

Li P, Zhang Y, Wang YM, Duan CM, Hao T, Wu BL, Wang CY. **RCCS enhances EOE cell proliferation and their differentiation into ameloblasts.** *Mol Biol Rep.* Epub June 2011

Ishikawa M, Sekine K, Okamura A, Zheng YW, Ueno Y, Koike N, Tanaka J, Taniguchi H. **Reconstitution of hepatic tissue architectures from fetal liver cells obtained from a three-dimensional culture with a rotating wall vessel bioreactor.** *J Biosci Bioeng.* 111(6):711-8. June 2011

Consolo F, Bariani C, Mantalaris A, Montevecchi F, Redaelli A, Morbiducci U. **Computational modeling for the optimization of a cardiogenic 3D bioprocess of encapsulated embryonic stem cells.** *Biomech Model Mechanobiol.*, Apr 2011

Kammer NN, Billecke N, Morgul MH, Adonopoulou MK, Mogl M, Huang MD, Florek S, Schmitt KR, Raschok N, Sauer IM. **Labeling of primary human hepatocytes with micron-sized iron oxide particles in suspension culture suitable for large-scale preparation.** *Artif Organs.*;35(4):E91-100. doi: 10.1111/j.1525-1594.2010.01177.x, Apr 2011

Yeatts AB, Fisher JP. **Bone tissue engineering bioreactors: dynamic culture and the influence of shear stress.** *Bone;* 48(2):171-81. 2011

Valmikinathan CM, Hoffman J, Yu X. **Impact of Scaffold Micro and Macro Architecture on Schwann Cell Proliferation under Dynamic Conditions in a Rotating Wall Vessel Bioreactor.** *Mater Sci Eng C Mater Biol Appl.* 2011 Jan 1;31(1):22-29

Sheehy EJ, Buckley CT, Kelly DJ., **Chondrocytes and bone marrow-derived mesenchymal stem cells undergoing chondrogenesis in agarose hydrogels of solid and channelled architectures respond differentially to dynamic culture conditions.** *J Tissue Eng Regen Med.* Epub Jan 2011

- Cinbiz MN, Tıg̈li RS, Beşkardeş IG, Gümüşdereliođlu M, Colak U. **Computational fluid dynamics modeling of momentum transport in rotating wall perfused bioreactor for cartilage tissue engineering.** *J Biotechnol*; 150(3):389-95; 2010
- Skardal A, Sarker SF, Crabbé A, Nickerson CA, Prestwich GD., **The generation of 3-D tissue models based on hyaluronan hydrogel-coated microcarriers within a rotating wall vessel bioreactor.** *Biomaterials*. 31(32):8426-35, 2010
- Cortiella J, Niles J, Cantu A, Brettler A, Pham A, Vargas G, Winston S, Wang J, Walls S, Nichols JE. **Influence of acellular natural lung matrix on murine embryonic stem cell differentiation and tissue formation.** *Tissue Eng Part A*. 2010 Aug;16(8):2565-80
- Lee KW, Wang S, Dadsetan M, Yaszemski MJ, Lu L. **Enhanced cell ingrowth and proliferation through three dimensional nano composite scaffolds with controlled pore structures.** *Biomacromolecules*. 11:682-9, 2010.
- Skardal A., Sarker SF, Crabbe A, Nickerson CA, Prestwich GD. **The generation of 3-D tissue models based on hyaluronan hydrogel-coated microcarriers within a rotating wall bioreactor.** *Biomaterials* 31:8426-8435, 2010
- Li S, Ma Z, Niu Z, Qian H, Xuan D, Hou R, Ni L. **NASA approved rotary bioreactor enhances proliferation and osteogenesis of human periodontal ligament stem cells.** *Stem Cells Dev*. 18:1273-82, 2009
- Jin F, Zhang Y, Xuan K, He D, Deng T, Tang L, Lu W, Duan Y. **Establishment of three-dimensional tissue-engineered bone constructs under microgravity-simulating conditions.** *Artif Organs* 34: 118-125, 2009
- Sailon AM, Allori AC, Davidson EH, Reformat DD, Allen RJ, Warren SM. **A novel flow-perfusion bioreactor supports 3D dynamic cell culture.** *J Biomed Biotechnol*. 2009;2009:873816
- Lv Q, Nair L, Laurencin CT. **Fabrication, characterization, and in vitro evaluation of poly(lactic acid glycolic acid)/nano-hydroxyapatite composite microsphere-based scaffolds for bone tissue engineering in rotating bioreactors.** *J Biomed Mater Res A* 91:679-691, 2009
- Li WJ, Jiang, YJ, Tuan RS. **Cell-Nanofiber based cartilage tissue engineering using improved cell seeding, growth factor and bioreactor technologies.** *Tissue Engineering: Part A*. 14: 639-48, 2008
- Hwang YS, Cho J, Tay F, Heng JY, Ho R, Kazarian SG, Williams DR, Boccaccini AR, Polak JM, Mantalaris A. **The use of murine embryonic stem cells, alginate encapsulation, and rotary microgravity bioreactor in bone tissue engineering.** *Biomaterials* 30: 499-507, 2008
- Ma W, Tavakoli T, Chen S, Maric D, Liu JL, O'Shaughnessy TJ. **Reconstruction of Functional Cortical-Like Tissues from Neural Stem and Progenitor Cells.** *Tissue Eng Part A* 14: 1687-1697, 2008
- Li WJ, Jiang YJ, Tuan RS. **Cell-Nanofiber-Based Cartilage tissue Engineering Using Improved Cell Seeding, Growth Factor, and Bioreactor Technologies.** *Tissue Eng Part A* 14:639-648, 2008
- Okamura A, Zheng YW, Hirochika R, Tanaka J, Taniguchi H. **In-vitro reconstitution of hepatic tissue architecture with neonatal mouse liver cells using three –dimensional culture.** *J Nanosci Nanotechnol* 7: 721-725, 2007
- Fry CA, Patrick CW. **Three-dimensional adipose tissue model using low shear bioreactors.** *In Vitro Cell Dev Biol Anim*. 42:109-114, 2006
- Waters SL, Cummins LJ, Shakesheff KM, Rose FR. **Tissue growth in a rotating bioreactor. Part I: mechanical stability.** *Math. Med. Biol.* 23: 311-337, 2006
- Kumar R, Dutt K: **Enhanced neurotrophin synthesis and molecular differentiation in non-transformed human retinal progenitor cells cultured in a rotating bioreactor.** *Tissue Eng*. 12: 141-158, 2006.
- Su GN, Hidaka M, Kimura Y, Yamamoto G: **In Situ Collagen Gelation: A New Method for Constructing Large Tissue in Rotary Culture Vessels:** *In Vitro Cell Dev Biol Anim* 39: 368-374, 2003.

Dutt K, Sanford G, Harris-Hooker S, Brako L, Kumar R, Sroufe A, Melhado S: **Three-Dimensional Model of Angiogenesis: Coculture of Human Retinal Cells with Bovine Aortic Endothelial Cells in the NASA Bioreactor.** *Tissue Eng* 9: 893-907 2003.

Dutt K, Harris-Hooker S, Ellerson D, Layne D, Kumar R, Hunt R: **Generation of 3-D Retina-Like Structures From a Human Retinal Cell Line in a NASA Bioreactor.** *Cell Trans* 12: 717-731, 2003

Green LM, Patel Z, Murray DK, Rightnar S, Burell CG, Gridley DS, Nelson GA: **Cytoskeletal and Functional Changes in Bioreactor Assembled Thyroid Tissue Organoids Exposed to Gamma Radiation.** *J Radiat. Res.* 43: S213-S218, 2002.

Sanford GL, Ellerson D, Melhado-Gardner C, Sroufe AE, Harris-Hooker S: **Three-dimensional Growth of Endothelial Cells in the Microgravity-Based Rotating Wall Vessel Bioreactor: In Vitro Cell Dev Biol Anim.,** 38: 493-504, 2002.

Freed LE, Vunjak-Novakovic G: **Spaceflight Bioreactor Studies of Cells and Tissues.** *Adv Space Biol Med* 8:177-195, 2002.

Sikavitsas VI, Bancroft GN, Mikos AG: **Formation of three-dimensional cell/polymer constructs for bone tissue engineering in a spinner flask and a rotating wall vessel bioreactor.** *J Biomed Mater Res* 62: 136-148, 2002.

Gosiewska A, Rezanian A, Dhanaraj S, Vyakarnam M, Zhou J, Brown L, Kong W, Zimmerman M and Geesin JC: **Development of a Three-Dimensional Transmigration Assay for Testing Cell-Polymer Interactions for Tissue Engineering Applications.** *Tissue Eng* 7: 267-77, 2001.

Martin A, Zhou A, Gordon RE, Henderson SC, Schwartz AE, Friedman EW and Davies TF: **Thyroid Organoid Formation in Simulated Microgravity: Influence of Keratinocyte Growth Factor.** *Thyroid* 10: 481-487, 2000.

Freed LE and Vunjak-Novakovic G: **Tissue Engineering Bioreactors.** *Principles of Tissue Engineering*, 2nd Edition, Chapter 13, pp. 143-156, 2000.

Langer RS and Vacanti JP: **Tissue Engineering: The Challenges Ahead.** *Scientific American.* 280: 86-89, 1999.

Unsworth BR and Lelkes PI: **Growing Tissues in Microgravity.** *Nature Medicine* 4: 901-907, 1998.

Freed LE and Vunjak-Novakovic G: **Culture of Organized Cell Communities.** *Adv Drug Delivery Reviews* 33: 15-30, 1998.

Unsworth BR, Lelkes PI: **The Use of Rotating Wall Bioreactors for the Assembly of Differentiated Tissue-Like Organoids.** *Advances in Tissue Engineering: New developments in cartilage, skin and bone engineering*, Chapt. 2.3, pp. 113-32, 1998.

Freed LE and Vunjak-Novakovic G: **Microgravity Tissue Engineering.** *In Vitro Cell Dev Biol Anim* 33: 381-385, 1997.

Duray PH, Hatfill SJ and Pellis NR: **Tissue Culture in Microgravity.** *Science & Medicine*, 4: 45-55, 1997.

Grymes RA, Sawyer C: **A Novel Culture Morphology Resulting From Applied Mechanical Strain.** *In Vitro Cell Dev Biol Anim* 33: 392-397, 1997.

Goodwin TJ, Schroeder WF, Wolf DA and Moyer MP: **Rotating-Wall Vessel Co-culture Of Small Intestine As A Prelude To Tissue Modeling: Aspects of Simulated Microgravity.** *Proc Soc Exp Biol Med* 202: 181-192, 1993.

Goodwin TJ, Prewett TL, Wolf DA and Spaulding GF: **Reduced Shear Stress: A Major Component in the Ability of Mammalian Tissues to Form Three Dimensional Assemblies in Simulated Microgravity.** *J Cell Biochem* 51: 301-311, 1993.

Lelkes PI, Ramos E, Nikolaychik VV, Wankowski D, Unsworth B, Goodwin TJ: **GTSF-2: A New, Versatile Cell Culture Medium for Diverse Normal and Transformed Mammalian Cells.** *In Vitro Cell Dev Biol Anim* 33: 344-351, 1997.

TOXICOLOGY

Montani C, Steimberg N, Boniotti J, Biasiotto G, Zanella I, Diafera G, Biunno I, Caimi L, Mazzoleni G, Di Lorenzo D. **Fibroblasts maintained in 3 dimensions show a better differentiation state and higher sensitivity to estrogens.** *Toxicol Appl Pharmacol.* 2014 Aug 28. pii: S0041-008X(14)00313-5. doi: 10.1016/j.taap.2014.08.021.

Tropitzsch A, Arnold H, Bassiouni M, Müller A, Eckhard A, Müller M, Löwenheim H. **Assessing cisplatin-induced ototoxicity and otoprotection in whole organ culture of the mouse inner ear in simulated microgravity.** *Toxicol Lett.* 2014 Apr 5. pii: S0378-4274(14)00144-1. doi: 10.1016/j.toxlet.2014.03.022.

Xiao Y, Liu Y, Wang G. **Involvement of nitric oxide in the mechanism of biochemical alterations induced by simulated microgravity in *Microcystis aeruginosa*.** *Advances in Space Research.* 2012 March 1; 49(5):850-8. doi: 10.1016/j.asr.2011.11.003.

Radtke AL, Wilson JW, Sarker S, Nickerson CA. **Analysis of Interactions of Salmonella type three secretion mutants with 3-D intestinal epithelial cells.** *PLoS One* 29;5:e15750, 2010

Gonda SR, Wu H, Pingerelli PL, and Glickman BW: **Three-Dimensional Transgenic Cell Model to Quantify Genotoxic Effects of Space Environment.** *Adv Space Res* 27: 421-430, 2001.

Goodwin TJ, Coate-Li L, Linnehan RM, and Hammond TG: **Selected Contribution: a Three-Dimensional Model for Assessment of In Vitro Toxicity in Balena Mysticetus Renal Tissue.** *J Appl Physiol* 89: 2508-2517, 2000.

VIRAL

Three-Dimensional Rotating Wall Vessel-Derived Cell Culture Models for Studying Virus-Host Interactions. Gardner JK, Herbst-Kralovetz MM. *Viruses.* 2016 Nov 9;8(11). pii: E304.

A Study of Alterations in DNA Epigenetic Modifications (5mC and 5hmC) and Gene Expression Influenced by Simulated Microgravity in Human Lymphoblastoid Cells.

Chowdhury B, Seetharam A, Wang Z, Liu Y, Lossie AC, Thimmapuram J, Irudayaraj J. *PLoS One.* 2016 Jan 28;11(1):e0147514. doi: 10.1371/journal.pone.0147514. eCollection 2016.

3D rotating wall vessel and 2D cell culture of four veterinary virus pathogens: A comparison of virus yields, portions of infectious particles and virus growth curves.

Malenovská H. *J Virol Methods.* 2015 Nov 9. pii: S0166-0934(15)00356-0. doi: 10.1016/j.jviromet.2015.11.002.

3D tissue-like assemblies: A novel approach to investigate virus-cell interactions.

Goodwin TJ, McCarthy M, Cohrs RJ, Kaufer BB. *Methods.* 2015 May 15. pii: S1046-2023(15)00203-0. doi: 10.1016/j.ymeth.2015.05.010.

Papafragkou E, Hewitt J, Park GW, Greening G, Vinjé J. **Challenges of culturing human norovirus in three-dimensional organoid intestinal cell culture models.** *PLoS One.* 2013 Jun 3;8(6):e63485. doi:

10.1371/journal.pone.0063485.

Herbst-Kralovetz MM, Radtke AL, Lay MK, Hjelm BE, Bolick AN, Sarker SS, Atmar RL, Kingsley DH, Arntzen CJ, Estes MK, Nickerson CA. **Lack of norovirus replication and histo-blood group antigen expression in 3-dimensional intestinal epithelial cells.** *Emerg Infect Dis.* 2013 Mar;19(3):431-8. doi: 10.3201/eid1903.121029.

Brinley AA, Theriot CA, Nelman-Gonzalez M, Crucian B, Stowe RP, Barrett AD, Pierson DL. **Characterization of Epstein-Barr virus reactivation in a modeled spaceflight system.** *J Cell Biochem.* 2013 Mar;114(3):616-24. doi: 10.1002/jcb.24403.

Straub TM, Bartholomew RA, Valdez CO, Valentine NB, Dohnalkova A, Ozanich RM, Bruckner-Lea CJ, Call DR. **Human norovirus infection of caco-2 cells grown as a three-dimensional tissue structure.** *J Water Health.* 2011 Jun;9(2):225-40.

Straub TM, Honer zu Bentrup K, Orosz-Coghlan, P, Dohnalkova A, Mayer BK, Bartholomew RA, Valdez CO, Bruckner-Lea C, Gerba CP, Abbaszadegan M, Nickerson CA, **In vitro Cell Culture Infectivity Assay for Human Noroviruses.** *Emerging Infectious Diseases* 13: 396-403, 2007

Hughes JH and Long JP: **Epstein-Barr Virus Latently Infected Cells are Selectively Deleted in Simulated-Microgravity Cultures.** *In Vitro Cell Dev Biol Anim* 37: 223-230, 2001.

Long JP, Pierson S, and Hughes JH: **Suppression of Epstein-Barr Virus Reactivation in Lymphoblastoid Cells Cultured in Simulated Microgravity.** *In Vitro Cell Dev Biol Anim* 35: 49-54, 1999.

Long JP, Pierson S, Hughes JH: **Rhinovirus Replication in HeLa Cells Cultured Under Conditions of Simulated Microgravity.** *Aviat Space Environ Med* 69: 851-856, 1998.

Margolis L, Fitzgerald W, Glushakova S, Hatfill S, Amichay N, Baibakov B and Zimmerberg J: **Lymphocyte Trafficking and HIV Infection of Human Lymphoid Tissue in a Rotating Wall Vessel Bioreactor.** *AIDS Res Hum Retroviruses* 13: 1411-1420, 1997.

YEAST

Qi F, Wang C, Liu Y, Kaleem I, Li Q, Li C. **Transcriptional Profiling of Protein Expression Related Genes of *Pichia pastoris* under Simulated Microgravity.** *PLoS One.* 2011;6(11):e26613. Epub Nov 2011.

Qi F, Dai, D, Liu Y, Kaleem I, Li C. **Effects of low-shear modeled microgravity on the characterization of recombinant β -D-glucuronidase expressed in *Pichia pastoris*.** *Appl Biochem Biotechnol* 163:162-172, 2011

Sheehan KB, McInnerney K, Purevdori-Gage B, Altenburg SD. **Yeast genomic patterns in response to low-shear modeled microgravity.** *BMC Genomics* 8:3, 2007

Johanson K, Allen PL, Lewis F, Cubano LA, Hyman LE, and Hammond TG: **Saccharomyces cerevisiae gene expression changes during rotating wall vessel suspension culture.** *J Appl Physiol* 93: 2171-80, 2002.

MISCELLANEOUS

Li Q, Mei Q, Huyan T, Xie L, Che S, Yang H, Zhang M, Huang Q. **Effects of simulated microgravity on primary human NK cells.** *Astrobiology.* 2013 Aug;13(8):703-14. doi: 10.1089/ast.2013.0981.

Sun T, Xie X, Zhang JQ, Bao J, Tang CZ, Lei DX, Qiu JH, Wang GX. **Effect of horizontal rotary culture on zebrafish vascular development.** *Yi Chuan.* 2013 Apr;35(4):502-10. (Article in Chinese)

Jin L, Feng G, Reames DL, Shimer AL, Shen FH, Li X **The effects of simulated microgravity on intervertebral disc degeneration.** *Spine J.* 2013 Mar;13(3):235-42. doi: 10.1016/j.spinee.2012.01.022.

Foster JS, Khodadad CL, Ahrendt SR, Parrish ML **Impact of simulated microgravity on the normal developmental time line of an animal-bacteria symbiosis.** *Sci Rep.* 2013 Feb 26;3:1340. doi: 10.1038/srep01340.

Zwezdaryk KJ, Warner JA, Machado HL, Morris CA, Höner zu Bentrup K. **Rotating cell culture systems for human cell culture: human trophoblast cells as a model.** *J Vis Exp.* 2012 Jan 18;(59). pii: 3367. doi: 10.3791/3367

Zheng H, Tian W, Yan H, Yue L, Zhang Y, Han F, Chen X, Li Y. **Rotary culture promotes the proliferation of MCF-7 cells encapsulated in three-dimensional collagen-alginate hydrogels via activation of the ERK1/2-MAPK pathway.** *Biomed Mater.* 2012 Feb; 7(1):015003. doi: 10.1088/1748-6041/7/1/015003. Epub 2012 Jan 20.

- Mangala LS, Zhang Y, He Z, Emami K, Ramesh GT, Story M, Rohde LH, Wu H. **Effects of Simulated Microgravity on Expression Profile of MicroRNA in Human Lymphoblastoid Cells.** *J Biol Chem.* 286(37):32483-90, 2011
- Zheng L, Liu JZ, Hu YW, Zhong TY, Xiong SL, Wang W, Wang Q. **Simulated microgravity, erythroid differentiation, and the expression of transcription factor GATA-1 in CD34+ cells.** *Aviat Space Environ Med.* 82(5):513-7. 2011
- Singh KP, Kumari R, Dumond JW. **Simulated microgravity-induced epigenetic changes in human lymphocytes.** *J Cell Biochem.* 111(1):123-9, 2010
- Hjelm BE, Berta AN, Nickerson CA, Arntzen CJ, Herbst-Kralovetz MM. **Development and characterization of a three-dimensional organotypic human vaginal epithelial cell model.** *Biol Reprod.* 82:617-27, 2010
- Olson WM, Wiens DJ, Gaul TL, Rodriguez M, Hauptmeier CL. **Xenopus development from late gastrulation to feeding tadpole in simulated microgravity.** *Intl J Dvl Biol.* ;54:167-74.
- Schrader S, Kremling C, Clinger M, Laguna H, Geerling G. **Cultivation of Lacrimal gland acinar cells in a microgravity environment.** *Br J Ophthalmol.* 93: 1121-1125, 2009
- Kwon O, Devarakonda SB, Sankovic JM, Banerjee RK. **Oxygen transport and consumption by suspended cells in microgravity: A multiphase analysis.** *Biotechnol Bioeng* 99:99-107, 2008
- Sawyer N, Worrall L, Crowe J, Waters, S, Shakesheff K, Rose F, Morgan S. **In situ monitoring of 3D in vitro cell aggregation using an optical imaging system.** *Biotechnol Bioeng* 100:159-167, 2007
- Chen J, Chen R, Gao S. **Morphological characteristics and proliferation of keratocytes cultured under simulated microgravity.** *Artif Organs* 31: 722-731, 2007
- Manti L. **Does reduced gravity alter cellular responses to ionizing radiation?** *Radiat Environ Biophys* 45: 1-8, 2006
- Cao YJ, Fan XJ, Shen Z, Ma BH, Duan EK. **Nitric oxide affects preimplantation embryonic development in a rotating wall vessel bioreactor simulating microgravity.** *Cell Biol. Int.* 31: 24-29, 2007
- Johanson K, Allen PL, Gonzalez-Villalobos RA, Baker CB, D'Elia R, Hammond TG.: **Gene expression and survival changes in Saccharomyces cerevisiae during suspension culture.** *Biotechnol Bioeng* 93: 1050-1059, 2006.
- Shimada N, Sokunbi G, Moorman SJ: **Changes in gravitational force affect gene expression in developing organ systems at different developmental times.** *BMC Dev Biol* 5: 10 , 2005.
- Hsieh C, Chao P, Fang S.: **Morin Sulphates/Glucuronides Enhance Macrophage Function in Microgravity Culture System: European Journal of Clinical Investigation** 35, 591-596, 2005
- Canova S, Fiorasi F, Mognato M, Grifalconi M, Reddi E, Russo A, Celotti L: **“Modeled Microgravity” Affects Cell Response to Ionizing Radiation and Increase Genomic Damage.** *Radiat Res* 163: 191-199, 2005.
- Xu Y, Sun J, Mathew G, Jeevarajan AS, Anderson MM: **Continuous Glucose Monitoring and Control in a Rotating Wall Perfused Bioreactor.** *Biotechnol Bioeng.* 86: 473-477, 2004.
- Gao FG, Jeevarajan AS, Anderson MM: **Long-Term Continuous Monitoring of Dissolved Oxygen in Cell Culture Medium for Perfused Bioreactors Using Optical Oxygen Sensors.** *Biotechnol Bioeng.* 86: 425-433, 2004.
- Foster LJ, Catzel D, Atwa S, Zarka M, Mahler SM: **Increase in Synthesis of Human Monoclonal Antibodies by Transfected Sp2/0 Myeloma Mouse Cell Line Under Conditions of Microgravity.** *Biotechnol Lett.* Aug. 25: 1271-1274, 2003.

- Bhat GK, Yang H, Sridaran R: **Simulated Conditions Of Microgravity Suppress Progesterone Production by Luteal Cells of the Pregnant Rat.** *J Gravit Physiol Dec*; 8: 57-66, 2001.
- Saarinen MA, Reece JS, Arnold MA, Murhammer DW: **Monitoring and Controlling the Dissolved Oxygen (DO) Concentration Within the High Aspect Ration Vessel (HARV).** *Biotechnol. Prog.* 19; 1335-1341, 2003.
- Begley CM, Kleis SJ: **RWPV Bioreactor Mass Transport: Earth-Based and in Microgravity.** *Biotechnol Bioeng*, 80: 465-76, 2002.
- Hales NW, Yamauchi K, Martinez AA, Sundaresan A, Pellis NR and Kulkarni AD: **A Countermeasure to Ameliorate Immune Dysfunction in In Vitro Simulated Microgravity Environment: Role of Cellular Nucleotide Nutrition.** *In Vitro Cell Dev Biol (Animal)* 38(4):213-217, 2002.
- Kulkarni AD, Yamauchi K, Taga M, Savary CA, Sundaresan A and Pellis NR: **Space Immunology and Countermeasure Research in Modeled Microgravity.** *Proceedings of the Aerospace Sciences and Conference*, AIAA-2002-0325:1-6, 2002.
- Yuanhang Xu, Antony S. Jeevarajan, James M. Gay, Thomas D Taylor, Melody M. Anderson: **On-Line Measurement of Glucose in a Rotating Wall Perfused Vessel Using an Amperometric Glucose Sensor,** *J The Electrochemical Society*, 149: H103- H106, 2002.
- Jeevarajan AS, Vani S, Taylor TD, Anderson MM: **Continuous pH Monitoring in a Perfused Bioreactor System Using an Optical pH Sensor.** *Biotechnol Bioeng* 78: 467-472, 2002.
- Moorman SJ, Cordova R, Davies SA: **A Critical Period for Functional Vestibular Development in Zebrafish,** *Dev Dyn* 223: 285-291, 2002.
- Kulkarni AD, Yamauchi K. and Pellis NR. **Nutrition Countermeasure and Immune Function in Microgravity.** *Proceedings of the 2nd Pan Pacific Basin Workshop on Microgravity Sciences*, Pasadena, CA. April 2001BT-1099:1-10, 2001.
- Jessup JM, and Pellis NR: **NASA Biotechnology: Cell Science in Microgravity.** *In Vitro Cell Dev Biol Anim* 37: 2 p preceding 63, 2001.
- Begley CM and Kleis SJ: **The Fluid Dynamic and Shear Environment in The NASA/JSC Rotating-Wall Perfused Vessel Bioreactor.** *Biotechnol Bioeng* 70: 32-40, 2000.
- Pollack SR, Meaney DF, Levine EM, Litt M, Johnston ED: **Numerical Model and Experimental Validation of Microcarrier Motion in a Rotating Bioreactor.** *Tiss Engin* 6: 519-530, 2000.
- Hammond T, Gonda F, Navar G, Campbell W, Majewski R, Galvan D, Pontillion F, Kaysen J, Goodwin T, Paddock S and Verroust P: **Membrane Potential Mediates H⁺-ATPase Dependence of "Degradative Pathway" Endosomal Fusion.** *J Memb Biol* 162: 157-167, 1998.
- Spaulding GF, Jessup JM and Goodwin TJ: **Advances in Cellular Construction.** *J Cell Biochem* 51: 249-251, 1993.
- Tsao YD, Goodwin TJ, Wolf DA, Spaulding GF: **Responses Of Gravity Level Variations On The NASA JSC Bioreactor System.** *Physiologist* 35: Suppl S49-50, 1992.
- Schwarz RP, Goodwin TJ, Wolf DA: **Cell Culture for Three-Dimensional Modeling in Rotating Wall Vessels: An Application of Simulated Microgravity.** *J Tissue Culture Methods* 14: 51-58, 1992.
- Wolf DA, Schwarz RP: **Analysis of Gravity-Induced Particle Motion and Fluid Perfusion Flow in the NASA-Designed Rotating Zero-Head-Space Tissue Culture Vessel.** *NASA Technical Paper 3143*, October, 1991.
- Dedolph RR and Dipert MH: **The Physical Basis of Gravity Stimulus Nullification by Clinostat Rotation.** *Plant Physiol* 47: 756-764, 1971.

Carrlsson SI, Bertilaccio MT, Ascari I, Bradamante S, Maier JA. **Modulation of Human Endothelial Cell Behavior in Simulated Microgravity.** *J Gravit Physiol* 9: P273-274, 2002.

Moore R. **Comparative Effectiveness of a Clinostat and a Slow-Turning Lateral Vessel at Mimicking the Ultrastructural Effects of Microgravity in Plant Cells.** *Ann Bot (Lond)*. 66: 541-549, 1990.

Bradamante S, Barengi L, Villa A. **Simulated Weightlessness in the Design and Exploitation of a NMR-Compatible Bioreactor.** *Biotechnol Prog*. 20: 1454-1459, 2004.