

CURRICULUM VITAE

BIOGRAPHICAL

Name: Sudha Agarwal, Ph.D.

Home Address: 2520 Stonehaven Place
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Birth Place: Indore, India

Citizenship: United States

EDUCATION AND TRAINING

1964-1966	Agra University, India	M.Sc.	Zoology
1967-1973	Northeastern University, Boston	Ph.D.	Biology (Cell Physiology)
2001-2001	Katz School of Business Administration, University of Pittsburgh	Mini-MBA	Mini-MBA for Biomedical Sci

POST GRADUATE

1972 - 1974	Massachusetts General Hospital, HMS, Boston Department of Radiation Medicine	Post-Doc Fellow	Dr. Jan Vaage Immunology
1984 - 1987	The Johns Hopkins University School of Medicine Baltimore. Department of Molecular Biology & Genetics and Department of Surgery	Research Associate/ Post-Doc	Drs. Manfred, Mayer & Hyun Shin

ACADEMIC APPOINTMENTS

1977 - 1981	Department of Surgery and Biochemistry Georgetown University School of Medicine Washington, DC.	Instructor
1981 - 1983	Bethesda Research Laboratories, Rockville, MD	Scientist
1984 - 1987	Department of Molecular Biology and Dept Surgery	Research Associate/ Fellow

	Johns Hopkins Univ School of Medicine, Baltimore, MD.	
1987 - 1991	Department of Microbiology/ Periodontics University of Maryland, Baltimore, MD.	Research Assistant Professor
1992 - 1994	Dept of Microbiology & Biochemistry, School of Dental Medicine, and Dept of Molecular Genetics, Virology and Biochemistry, School of Medicine, University of Pittsburgh.	Research Associate Professor
1994 - 2003	Division of Oral Biology (Head 1994-98), Dept of Microbiology, Oral Medicine and Pathology, and Oral & Maxillofacial Surgery, School of Dental Medicine, University of Pittsburgh Pittsburgh, PA.	Tenured Associate Professor
2004 - 2005	The OSU College of Dentistry, Columbus, OH	Acting Associate Dean for Research
2003 - 2007	Section of Oral Biology, The Ohio State University College of Dentistry, Columbus, OH	Head
2003 - present	Biomechanics and Tissue Engineering Laboratory	Director
2003 - present	Division of Oral Biology, The Ohio State University College of Dentistry, Columbus, OH	Professor
2003 - present	Department of Orthopedics, The Ohio State University College of Medicine, Columbus, OH	Professor

AUXILIARY APPOINTMENTS

1997 - 2003	Pittsburgh Tissue Engineering Initiative	Member Faculty
1997 - 2003	Biomechanics and Tissue Engineering Laboratory, University of Pittsburgh School of Dental Medicine	Director
2001 - 2003	McGowen Institute of Regenerative Medicine University of Pittsburgh, PA.	Faculty
2003 - present	College of Graduate Studies, OSU	Graduate Faculty (P)
2004 - present	The Dorothy M. Davis Heart and Lung Research Institute, The Ohio State University College of Medicine	Investigator
2004 - present	Biomedical Engineering Program The Ohio State University College of Engineering.	Participating Faculty

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

Federation of American Societies of Experimental Biologists (FASEB)
 American Association for Immunologists (AAI)
 International Cytokine Society (ICS)
 Tissue Engineering Society International (TESI)
 American Society for Bone and Mineral Research (ASMBR)
 Orthopaedic Research Society (ORS)
 OsteoArthritis Research Society International (OARSI)
 International/American Associations for Dental Research (AADR)

HONORS AND AWARDS

National Institute of Health, Postdoctoral Fellowship.	1974-1977
Bressler Foundation Research Award, University of Maryland Medical School, Baltimore, MD.	1982-1983
Designated Research Initiative Fund Award, University of Maryland School of Dental Medicine Baltimore, MD.	1988-1989
Designated Research Initiative Fund Award, University of Maryland School of Dental Medicine, Baltimore, MD.	1989-1990
Omikron Kappa Upsilon, Honorary National Membership in Beta Chapter	1996
Burton C. Borgelt SCADA Faculty Advisor of the Year, National Award given by The International Association of Student Clinicians-ADA, AADR, San Francisco	1996
NIH Study sections and Special Emphasis Panels (NIDCR, NIAMS, NCAAM, NCRR)	1996-present
NIAMS, Round Table Discussion Panel, NIH, Bethesda	2009
<i>Grant reviewer:</i> National Institute of Health (Bethesda, MD),	1999-present
University of Kuwait (Kuwait), Arthritis Research Campaign (UK), Arthritis Research (UK)	
Swiss National Science Foundation, American Society for Bone and Mineral Research (ASBMR)	
Pittsburgh Tissue engineering Initiative, McGowen Institute of Tissue Engineering.	
<i>Journal Reviewer:</i> Ad-hoc reviewer for more than 42 journals in the area of Tissue engineering, Orthopedics, Immunology and Molecular biology (Impact factors 2.5 to 11).	2002-present
<i>Journal Editor:</i> Academic Editor, <i>PLoS One</i> and <i>Frontiers of Craniofacial Biology</i>	2009-present.

RESEARCH

MANUSCRIPTS IN SUBMISSION

Nam J, Perera P, Rath B, and **Agarwal S.** (2012) Jak/STAT3 activation by compressive forces is mediated via induction of interleukin 11. *J Biomechanics*.

Knapik DM, Perera P, Nam J, Rath B, Hewett TE, Robling A, **Agarwal S.** (2012) Mechanosignaling in Bone Health and Inflammation. Invited Forum Review. *Antioxidants and Redox Signaling*.

Rath-Deschner B, Sjoström D, Anghelina M, Madhavan S, Deschner J, **Agarwal, S.** (2012) Sustained Anti-inflammatory Effects of Biomechanical Signals are mediated by IL-10.

Nam J, Perera P, Wu L-C, Liu S, Litsky AS, Sun Z, Gordon R, Rath B, Liu J, Madai F, Hackshaw KV, Zhao Y, Schneyer A, Butterfield TA, **Agarwal S.** (2012) FSTL3 mediates exercise driven bone formation.

Liu J, Agarwal SK, Perera P, **Agarwal S.** (2012) Immunomodulation by mechanical signals Promotes Functional Recovery in Oral Submucosal Fibrosis.

Perera P, Nam J, **Agarwal S.** (2012) Mechanotransduction modulated genes in cartilage.

Perera P, Knapik DM, Nam J, Young N, Wu L-C, Jarjour W, **Agarwal S.** (2012) Systemic actions of exercise are mediated via immunomodulation.

PEER REVIEWED MANUSCRIPTS (past 5 years)

Nam J, Perera P, Rath B, **Agarwal S.** (2012) Dynamic Regulation of Bone Morphogenetic Proteins in Engineered Osteochondral Constructs by Biomechanical Stimulation. *Tissue Engineering*. In Press.

Knapik DK, Perera P, Nam J, Rath B, Leblebicioglu B, Das H, Wu L-C, Hewett TE, Agarwal SK Jr, Robling AG, Lee BS, **Agarwal S.** (2012). Mechanosignaling in Bone Health and Inflammation. Invited Forum Review Article. *Antioxidants and Redox Signaling*.

Das M, Lu J, Joseph M, Aggarwal R, Kanji K, McMichael B, Lee BS, **Agarwal S,** Ray-Chaudhury A, HansIwenofu O, Kuppusamy P, Pompili VJ, Jain MK, & Das H. (2012) Kruppel-like factor 2 (KLF2) regulates monocyte differentiation and functions in mBSA and IL-1 β -induced arthritis. *Current Mol Med*.12(2) 113-125.

Aggarwal R, Lu J, Kanji S, Joseph M, Das M, Noble GJ, McMichael B, **Agarwal S,** Hart RH, Sun Z, Lee BS, Rosol TJ, Jackson R, Mao H-Q, Pompili V, Das H. (2012). Human Umbilical Cord Blood-Derived CD34+ Cells Reverse Osteoporosis in NOD/SCID Mice by Altering Osteoblastic and Osteoclastic Activities. *PLoS One* 7(6):e39365.

Nam J*, Perera P*, Liu J, Rath B, Deschner J, Gassner R, Butterfield TA, **Agarwal S.** (2011) Sequential Alterations in Catabolic and Anabolic Gene Expression Parallel Pathological Changes during Progression of Monoiodoacetate-induced Arthritis. *PLoS One*. *PLoS One*. 2011;6(9):e24320. Epub 2011 Sep 13. PMID: 21931681. * Joint first authorship.

Rath B, Nam J, Deschner J, Schaumburger J, Tingart M, Grassel S, Grifka J, **Agarwal S.** (2011) Biomechanical forces exert anabolic effects on osteoblasts by activation of SMAD 1/5/8 through type 1 BMP receptor. *Biorheology*, 48(1):37-48. PMID: 21515935

Nam J, Perera P, Liu J, Wu LC, Rath B, Butterfield TA, **Agarwal S.** (2011) Transcriptome-wide gene regulation by gentle treadmill walking during the progression of monoiodoacetate induced arthritis. *Arthritis Rheum*, 63:1613-1625. PMID: 21400474

Nam J, Johnson J, Lannutti JJ, **Agarwal S.** (2011) Modulation of embryonic mesenchymal progenitor cell differentiation via control over pure mechanical modulus in electrospun nanofibers. *Acta Biomater*. 7(4):1516-24. Epub 2010 Nov 22. PMID: 21109030

Liu S, Madiari F, Hackshaw KV, Allen CE, Carl J, Huschart E, Karanfilov C, Litsky A, Hickey CJ, Marcucci G, Huja S, **Agarwal S,** Yu J, Caligiuri MA, Wu LC. (2011) The large zinc finger protein ZAS3 is a critical modulator of osteoclastogenesis. *PLoS One*, 6(3):e17161. PMID: 21390242

Perera PM, Wypasek E, Madhavan S, Rath-Deschner B, Liu J, Nam J, Rath B, Huang Y, Deschner J, Piesco N, Wu C, **Agarwal S.** (2010). Mechanical signals control Sox-9, Vegf and c-Myc expression and cell proliferation during inflammation via integrin-linked kinase, B-Raf, and ERK 1/2-dependent signaling in articular chondrocytes. *Arthritis Research & Therapy*, 2010, 12:R106. PMID: 20509944

Liu J, and **Agarwal S.** (2010) Mechanical signals activate vascular endothelial growth factor receptor-2 to upregulate endothelial cell proliferation during inflammation. *J Immunology*. 2010, 15;185(2):1215-21. Jun 14. Epub PMID: 20548028

- Nam J, Aguda BD, Rath B, **Agarwal S**. Biomechanical Thresholds Regulate Inflammation through the NF- κ B Pathway: Experiments and Modeling. *PLoS ONE* 4(4): e5262. 2009, April 16. <http://www.plosone.org/article/info:doi/10.1371/journal.pone.0005262>
- Chen Q, Zhang H, Li Q, An Y, Herkenham M, Lai W, Popovich P, **Agarwal S**, and Quan N. (2009) Three promoters regulate tissue and cell specific expression of murine IL-1R1. *Jour Biol Chem*, 2009; 284:8703-13. e-pub Feb 5 2009. PMID: 19196714
- Zhao Y, Zheng H, Nam J, and **Agarwal S**. Fabrication of Skeletal Muscle Constructs by Topographic Activation of Cell Alignment. *Biotechnology and Bioengineering*. 2009;102(2):624-31. [2008 Aug 8, Epub ahead of print] PMID: 18958861
- Nam J, Rath B, Knobloch TJ, Lannutti JJ, **Agarwal S**. Novel electrospun scaffolds for the molecular analysis of chondrocytes under dynamic compression. *Tissue Eng Part A*. 2009;15:513-23. PMID:18694324.
- Zhao Y, Zeng H, Nam J, **Agarwal S**. Fabrication of Skeletal Muscle Constructs by Topographic Activation of Cell Alignment, *Biotechnology and Bioengineering*, 2009;102:624-631.
- Nam J, Rath B, Knobloch TJ, Lannutti JJ, **Agarwal S**. Anti- and Pro-inflammatory Chondrocytic Responses to Dynamic Compression: An In Vitro Study Using Electrospun Scaffolds. *Tissue Engineering Part A*. 2008 Aug 11. [Epub ahead of print] PMID: 18694324
- Anghelina M, Sjostrom D, Priyangi P, Nam J, Knobloch TJ, **Agarwal S**. (2008) The NF- κ B Transcription Factors and Biomechanical Signals in Chondrocytes. *Biorheology*, 5th International Symposium in Mechanobiology of Cartilage and Chondrocyte, Invited review, *Bioreology*, 45(2-3):245-256. PMID: 18836228.
- Nam J, Huang Y, **Agarwal S**, Lannutti JJ. Materials Selection and Residual Solvent Retention in Biodegradable Electrospun Fibers. *Journal of Applied Polymer Science*, 2008: 107(3), 1547-1554 .
- Sowa G, Deschner J, **Agarwal S**. Tensile Stress Exerts a Protective Effect on Intervertebral Disc Cells. *Am J Phys Med Rehabil*. 2008 Jan 17; Epub ahead of print, PMID: 18209665.
- Iscru DF, Anghelina M, Agarwal S, **Agarwal G**. Changes in surface topologies of chondrocytes subjected to mechanical forces: an AFM analysis. *J Structural Biol*. Mar 5, 2008. [Epub ahead of print] PMID: 18406170
- Butterfield TA, Zhao Y, **Agarwal S**, Haq F, Best TM. Cyclic compressive loading facilitates recovery following eccentric exercise. *Medicine and Science in Sports & Exercise*. 40(7):1289-1296, 2008. PMID: 18580410
- Zeng H, Butterfield TA, **Agarwal S**, Haq F, Best TM, Zhao Y. An Engineering Approach for Quantitative Analysis of the Lengthwise Strokes in Massage Therapies. *J Medical Devices*, 2:027530, 2008.
- Knobloch TJ, Madhavan S, Nam J, Agarwal S Jr, **Agarwal S**. Regulation of Chondrocytic Gene Expression by Biomechanical Signals. *Critical Reviews in Eukaryotic Gene Expression*. 18:139-150, 2008. Review. PMID: 18304028

Rath B, Nam J, Knobloch TJ, Lannutti JJ, **Agarwal S**. Compressive Forces Induce Osteogenic Gene Expression in Osteoblasts. *J Biomech*. 2008; 41(5):1095-103. Epub 2008 Jan 11. PMID: 18191137

Branski RC, Perera P, Verdolini K, Rosen CA, Hebda PA, **Agarwal S**. Dynamic Biomechanical Strain Inhibits IL-1 β -induced Inflammation in Vocal Fold Fibroblasts. *J Voice*. 21(6); 651-660, 2007.

Dossumbekova A, Anghelina M, , Madhavan S, He L, Knobloch TJ, **Agarwal S**. Biomechanical signals Inhibit IKK activity to attenuate NF-kB transcriptional activity in inflamed chondrocytes. *Arth & Rheumat*. 2007, 56(10):3284-3296 [Epub ahead of print] PMID: 17907174

Nam J, Huang Y, **Agarwal S**, and Lannutti J. Improved Cellular Infiltration in Electrospun Fiber via Engineered Porosity. *Tissue Engineering*. 2007;13(9):2249-2257. PMID: 17536926

Madhavan S, Anghelina M, Sjoström D, Dossumbekova A, Guttridge D, **Agarwal S**. Biomechanical Signals use TAK1 as a Molecular Switch to Inhibit Inflammation in Chondrocytes. *J Immunology*, 2007;179(9):6246-54. PMID: 17947700

Deschner J, Rath B, Wypasek E, Anghelina M, Sjoström D, **Agarwal S**. Biomechanical strain regulates TNFR2 but not TNFR1 in TMJ cells. *J Biomechanics* 40(7):1541-9, 2007. PMID: 17049356

Nair MK, Nair UP, Seyedain A, Gassner R, Piesco N, Mooney M, Ganta S, **Agarwal S**. Correlation of tuned aperture computed tomography with conventional computed tomography for evaluation of osseous healing in calvarial defects. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 103(2):267-73, 2007. PMID: 17234546

Chandran R, Knobloch TJ, Anghelina M, and **Agarwal S**. Biomechanical signals upregulate myogenic gene induction in the presence or absence of inflammation. *Am J Physiol Cell Physiol* , 2007, 293:C267-76. PMID: 17392379

Madhavan S, Anghelina M, Rath-Deschner B, Wypasek E, John A, Deschner J, Piesco N, **Agarwal S**. Biomechanical signals exert sustained attenuation of proinflammatory gene induction in articular chondrocytes. *Osteoarthritis Cartilage*. 10:1023-32, 2006. PMID: 16731008

Ferretti M, Gassner R, Wang Z, Perera P, Deschner J, Sowa G, Salter RB, **Agarwal S**. Biomechanical signals suppress proinflammatory responses in cartilage: early events in experimental antigen-induced arthritis. *J Immunol*. 177(12):8757-66, 2006. PMID: 17142778

Ferretti M, Madhavan S, Deschner J, Rath-Deschner B, Wypasek E, **Agarwal S**. Dynamic biophysical strain modulates proinflammatory gene induction in meniscal fibrochondrocytes. *Am J Physiol (Cell Physiol)* 290(6):C1610-5, 2006. PMID: 16452158

Deschner J, Rath-Deschner B, **Agarwal S**. Regulation of matrix metalloproteinase expression by dynamic tensile strain in rat fibrochondrocytes. *Osteoarthritis Cartilage*. 14(3):264-72, 2006. PMID: 16290189

Deschner J, Wypasek E, Ferretti M, Rath B, Anghelina M, **Agarwal S**. Regulation of RANKL by biomechanical loading in fibrochondrocytes of meniscus. *J Biomech*. 39(10):1796-803, 2006. PMID: 16038916

Ferretti M, Srinivasan A, Deschner J, Gassner R, Baliko F, Piesco N, Salter R, **Agarwal S**. Anti-inflammatory effects of continuous passive motion on meniscal fibrocartilage. *J Orthopaed Res*, 23(5): 1165-1171, 2005. PMID: 16140197

Agarwal S, Hofman C, Long P, Deschner J, Verma A, Evans C, Gassner R, Piesco N. NF-kB transcription factors are critical in antiinflammatory and proinflammatory actions of mechanical signals. *Arth and Rheumat* 50:3541-8, 2004. PMID: 15529376

REVIEWS, INVITED PAPERS, PROCEEDINGS OF SYMPOSIA, MONOGRAPHS, OR BOOK CHAPTERS (Past 5 years).

Knapik DM, Perera P, Nam J, Rath B, Hewett TE, Robling A, **Agarwal S**. (2012) Mechanosignaling in Bone Health and Inflammation. Invited Forum Review. *Antioxidants and Redox Signaling*.

PLoS Collections. The Mice Drawer System Experiment and the Space Endurance Record-Breaking Mice. Co-Editors Gimble, JM, and **Agarwal, S**. *PLoS One*. 2012: e40112.PMCID: PMC3392276

Nam J, Perera P, Agarwal S. Chondrocytes-matrix interactions during the regulation of proinflammatory genes in inflamed chondrocytes. *Invited article*. Theme issue on Matrix Biology, Ed. Kjaer M. *Scandinavian Journal of Medicine & Science in Sports*. 2009.

Madhavan S and **Agarwal S**. Mechanical Modulation of Bone during Tooth Movement. *In Craniofacial Growth and Development*. Co-Editors Mao JJ, Nah H-D, Blackwell Munksgund Publishing, 2008.

Anghelina M, Madhavan S, Sjostrom D, **Agarwal S**. Mechanisms of anti-inflammatory actions of biomechanical signals in chondrocytes. Symposium on mechanobiology of cartilage and chondrocytes. Special Issue *Biorheology*. *Invited review*, 2008.

Knobloch TJ, Madhavan S, Nam J, Agarwal S Jr, **Agarwal S**. Regulation of Chondrocytic Gene Expression by Biomechanical Signals. *Critical Reviews in Eukaryotic Gene Expression Critical Reviews in Eukaryotic Gene Expression*. *Invited review*. 18:139-150, 2008.

ABSTRACTS (Past five years)

Approximately 12 abstracts to be added for years 2011 and 2012.

Priyangi Perera, Jie Liu, Jin Nam, Bjoern Rath, Timothy Butterfield, **Sudha Agarwal**. Bone regenerative factor (BRF): An exercise induced mechnosensitive protein in bone. *Osteoarthritis Research Society International*, Brussels, Belgium. 2010.

J. Nam, P. Perera, J. Liu, T. Butterfield, **S. Agarwal**. Effects of Exercise on the Progression of OA in Knee joints. *Osteoarthritis Research Society International*, Brussels, Belgium. 2010.

Jie Liu, Priyangi Perera, Jin Nam, Bjoern Rath, James Deschner, **Sudha Agarwal**. In Search of a Mechanoreceptor: Does Mechanotransduction involves activation of multiple receptors on chondrocytes? Orthopedic Research Society, San Diego, CA, 2010.

M. Salas, Y. Kang, M. Carlton, D-G. Kim, **S. Agarwal**, D.N. Tatakis, B. Leblebicioglu. Alveolar Ridge Preservation: Clinical, Micro-Computerized Scan and Histological Evaluation. Int Assoc Dent Res, 2010.

Priyangi Perera, Jin Nam, Bjoern Rath, Jie Liu, Neil Jindal, Chelsea Grabarz , J. Friezner, **S. Agarwal**. Is Exercise Good for the Osteoarthritic Knees? A Transcriptome-Wide Scrutiny of Exercise-Induced Molecular Changes in Early and Late Osteoarthritic Knees. Orthopedic Research Society, San Diego, CA, 2010.

Nam, J, Perera, P, **Agarwal, S**. Regulation of Inflammation in Chondrocytes through NF- κ B and ATF3 Transcription Factors by Compressive Forces. Orthopedic Research Society, San Diego, CA, 2010.

Perera P, Nam J, Rath B, Liu J, Jindal N, Grabarz C, Friezner J, **Agarwal S**. Is Exercise Good for the Osteoarthritic Knees? A Transcriptome-Wide Scrutiny Of Exercise-Induced Molecular Changes in Early and Late Osteoarthritic Knees. Orthopedic Research Society, New Orleans, 2010.

Kang Y, Salas M, Johnson A, Kim D-G, Carlton M, Tatakis DN, **Agarwal S**, Leblebicioglu B. A Comparison of Histology and Micro-CT Evaluations for Regenerated Alveolar Bone. Am Assoc Deny Res. 2010

Nam, J, Perera P, **Agarwal, S**. Regulation of Inflammation in Chondrocytes through NF- κ B and ATF3 Transcription Factors by Compressive Forces. Orthopedic Research Society, New Orleans, 2010.

Agarwal S, Nam J, Perera P. Transcriptome and proteome wide analysis to understand the molecular profile of genes regulated by exercise in Osteoarthritis (OA). Invited speaker, Symposium Title: Anti-inflammatory effects of biomechanical signals in cartilage. Orthopedic Research Society. New Orleans, 2010.

Agarwal S, Nam J, Perera P. Mechanical Signals inhibit NF- κ B pathway to suppress inflammation in chondrocytes. Invited speaker. Gordon Research Conference, Des Lebertes, Switzerland, 2009

Perera P, Nam J, Friezner J, Liu J, **Agarwal, S**. Mechanomodulation of OA progression – a systems biology approach. Gordon Research Conference, Des Lebertes, Switzerland, 2009

Agarwal S, Perera P, Nam J, Liu J. An integrin linked kinase and RAS dependent mechanosignaling cascade controls cell proliferation and differentiation in articular chondrocytes. Gordon Research Conference, Des Labertes, Switzerland, 2009

Jie Liu, Priyangi Perera, Jin Nam, Bjoern Rath, James Deschner, **Sudha Agarwal**. Mechanotransduction involves activation of multiple receptors on chondrocytes. Osteoarthritis Research Society International, Rome 2009

Perera P, Nam J, Friezner J, **Agarwal S**. Exercise or not to exercise: A genome-wide analysis of the effects of exercise on eary and late OA. Osteoarthritis Research Society International, Montreal, Canada, 2009.

Nam J, Jed Johnson J, Lannutti J, **Agarwal S**. Regulation of Mesenchymal Stem Cell Differentiation by Controlling Moduli of Core-Shell Electrospun Fibers. Society for Biomaterials 2009, San Antonio Tx.

Agarwal S, Perera P, Nam J, Liu J. An integrin linked kinase and RAS dependent mechanosignaling cascade controls cell proliferation and differentiation in articular chondrocytes. Gordon Conference on Cartilage Biology and Pathology, Les Delebrates, Switzerland. June 7-12, 2009.

Liu J, and **Agarwal S**. Regulation of inflammation and angiogenesis by mechanoactivation of oral tissues. *Nominee, Hatton Research Competition*. American Association for Dental Research (AADR), 2009, Miami, FL

Perera P, Nam J, Friezner J, **Agarwal S**. Exercise or not to exercise: A genome wide analysis of the effects of exercise on early and late OA. Osteoarthritis Research Society International (OARSI), 2009. Montreal. Tracking Number: 09-A-594-OARSI.

Agarwal S, Perera P, Madhavan S, Liu J, Wypasek E, Deschner B. Integrin-linked kinase mediated RAS activation is required for mechanotransduction-induced proliferation and differentiation of articular chondrocytes. Osteoarthritis Research Society International (OARSI), 2009. Montreal.

Nam J, Johnson J, Lannutti J, **Agarwal S**. Regulation of Mesenchymal Stem Cell Differentiation by Controlling Moduli of Core-Shell Electrospun Fibers. Society for Biomaterials Annual Meeting, 2009. San Antonio, Tx

Agarwal S, Nam J, Rath B, Perera P. Transcriptional regulation of regenerative gene expression by biomechanical activation of chondrocytes-PCL constructs. Tissue Engineering and Regenerative Medicine Society International, Porto Portugal, 2008

Agarwal S. Matrix-dependent interactions are essential for mechanosignaling in chondrocytes. Matrix Biology-Cell-matrix interaction and mechanical loading the basis for understanding connective tissue diseases. *Invited presentation*. Cartilage Matrix Biology Symposium. Copenhagen, Denmark 2008

Agarwal S, and Perera P. Transcriptome wide analysis of articular chondrocytes exposed to biomechanical forces of various magnitudes. Osteoarthritis Research Society International (OARSI), 2008. Rome Italy.

Liu J, **Agarwal S**. Angiogenic Induction by mechanical forces requires activation of AKT pathway via VEGFR-2 in osteoarthritic joints. Osteoarthritis Research Society International (OARSI), 2008. Rome Italy. *Jei Liu, Young Investigator's Award, 2008*.

Perera P, Nam J, Rath B, Liu J, **Agarwal S**. RAS activation is required for ERK/MAP kinase mediated VEGF expression by biomechanical signals in articular chondrocytes. Osteoarthritis Research Society International (OARSI), 2008. Rome Italy.

Agarwal S, Nam J, Aguda B, Rath B. Biomechanical Forces Inhibit NF-kappaB Transcriptional Activity in TMJ: Mathematical Analysis. AADR, Dallas, 2008

Agarwal S, Nam J, Rath B, Madhvan S, Perera P. Physical Conditioning of Cartilage Explants Require RAS Activation for ERK MAP Kinases Mediated VEGF and Aggrecan Expression in Articular Chondrocytes. Tissue Engineering Research International Society (TERMIS), 2008, La Jolla, CA.

Nam J, Rath B, **Agarwal S**. Differential Regulation of BMPs on Chondrocytes and Osteoblasts in

Osteochondral Constructs by Biomechanical Forces. Tissue Engineering Research International Society (TERMIS), 2008, La Jolla, CA.

Nam J, Rath B, Perera P, **Agarwal S**. Compressive Forces Control Inflammation by Regulating Activation of NF- κ B Transcription Factor in Chondrocytes. Tissue Engineering Research International Society (TERMIS), 2008, La Jolla, CA.

Agarwal S, Liu J, Biswas S, Gordillo GM, Sen CK, Bergdall V. Are biomechanical forces responsible for the angiogenic properties of negative pressure wound therapy (NPWT)? Wound Healing Society, San Diego, 2008.

Liu J, Agarwal SK, Roy S, Gordillo GM, Gooch K, **Agarwal S**. Biomechanical signals support angiogenic properties of human microvascular endothelial cells. Wound Healing Society, San Diego, 2008.

Sjostrom D, Nam J, **Agarwal S**. C3H10T1/2 Cells Utilize Wnt Signaling During Chondrocyte Differentiation in Scaffolds. AADR, Dallas, 2008

Rath B, Ahuja P, Perera P, Deschner J, Ferretti M, **Agarwal S**. Effects of passive motion on OA cartilage depend upon the extent of cartilage damage. 52nd Orthopedic Research Society Meeting (ORS), San Francisco, CA, 2008

Rath B, Ahuja P, Perera P, Ahuja P, Ghosh A, Deschner J, Ferretti M, **Agarwal S**. Passive motion and immobilization both induce proinflammatory genes in grade three osteoarthritic cartilage, but passive motion protects low grade cartilage damage. 52nd Orthopedic Research Society Meeting (ORS), San Francisco, CA, 2008

Agarwal S, Madhavan S. Inflammation induced by LPS, IL-1, and TNF is suppressed by dynamic strain/compression via inhibition of TAK-1 in NF- κ B signaling cascade in chondrocytes. 52nd Orthopedic Research Society Meeting (ORS), San Francisco, CA, 2008

Rath B, Nam J, Lannutti J, **Agarwal S**. Osteogenic gene induction by compressive forces in calvarial osteoblasts. 52nd Orthopedic Research Society Meeting (ORS), San Francisco, CA, 2008

Madhavan S, Nam J, Rath B, **Agarwal S**. Effects of biomechanical signals are sustained for long time intervals and are mediated via prolonged inhibition of NF- κ B nuclear translocation in fibrochondrocytes. 52nd Orthopedic Research Society Meeting (ORS), San Francisco, CA, 2008

Nam J, Rath B, Aguda B, **Agarwal S**. Compressive forces suppress proinflammatory gene induction via inhibition of NF- κ B Transcription Factors in chondrocytes – an analysis by mathematical models. 52nd Orthopedic Research Society Meeting (ORS), San Francisco, CA, 2008

Rath B, Ahuja P, Perera P, Deschner J, Ferretti M, **Agarwal S**. Effects of passive motion on OA cartilage depend upon the extent of cartilage damage. 52nd Orthopedic Research Society Meeting (ORS), San Francisco, CA, 2008

Perera P, Chandran R, Zyga A, **Agarwal S**. Biomechanical signals induce myogenic gene induction via activation of Akt pathway in inflamed and healthy muscle cells. 52nd Orthopedic Research Society Meeting,

San Francisco, CA, 2008

Agarwal S, Madhavan S, Anghelina M, Knobloch T. Biomechanical signals block IKK activation to inhibit NF- κ B transcription in articular chondrocytes. Osteoarthritis Research Society Inc (OARSI), Ft Lauderdale, FL, Dec 2007.

Rath B, Nam J, Lannutti J, **Agarwal S**. Osteogenic gene induction by compressive forces in calvarial osteoblasts. Osteoarthritis Research Society Inc (OARSI), Ft Lauderdale, FL, Dec 2007.

Nam J, Rath B, Aguda B, **Agarwal S**. Compressive forces suppress proinflammatory gene induction via inhibition of NF- κ B transcription factors in chondrocytes – An analysis by mathematical models. Osteoarthritis Research Society Inc (OARSI), Ft Lauderdale, FL, Dec 2007. *Nam Jin, Young Investigator's Award 2007*.

Madhavan S, Nam J, Rath B, **Agarwal S**. Sustained effects of biomechanical signals are mediated via prolonged inhibition of I-kappa B kinase activation in articular chondrocytes. Osteoarthritis Research Society Inc (OARSI), Ft Lauderdale, FL, Dec 2007.

Nam J, Rath B, Aguda B, **Agarwal S**. Compressive forces suppress proinflammatory gene induction via inhibition of NF- κ B Transcription Factors in chondrocytes – an analysis by mathematical models. Osteoarthritis Research Society Inc (OARSI), Ft Lauderdale, FL, Dec 2007.

Agarwal S. The NF- κ B Transcription Factors and Biomechanical Signals in Chondrocytes. Invited speaker. Symposium: Mechanobiology of the Cartilage and Chondrocyte. Intl Soc of Cartilage Biology. Athens, Greece, 2007.

Agarwal S, Madhavan S, Anghelina M, Knobloch T. Biomechanical signals block IKK activation to inhibit NF- κ B transcription in articular chondrocytes. Osteoarthritis Research Society Inc (OARSI), Ft Lauderdale, FL, Dec 2007.

Danen S, Sjostrom, Thomas J, Knobloch, **Agarwal S**. Biomechanical Signals Can Prevent Fibrocartilage Degradation And Induce Repair In Temporomandibular Joint Disorders. Orthopaedic Research Society, Research Society, Trans Vol 32, # 0906, San Diego, CA, 2007.

Madhavan S, Anghelina M, Knobloch T, **Agarwal S**. Biomechanical Signals Block I-Kb Activation To Inhibit Nf- κ B-Mediated Proinflammatory Gene Transcription In Articular Chondrocytes. Orthopaedic Research Society, Trans Vol 32, # 0116, San Diego, CA, 2007

Perera P, Wang Z, Ferretti M, Deschner J, Gassner R, **Agarwal S**. PPAR Gamma Expression Mediates The Anti-Inflammatory Effects Of Continuous Passive Motion In Arthritic Cartilage. Orthopaedic Research Society, Research Society, Trans Vol 32, # 0731, San Diego, CA, 2007

Chandran R, Knobloch T.J, **Agarwal S**. Biomechanical Signals Regulate Myogenic Gene Expression in Skeletal Myoblasts. OSU – College of Dentistry, Columbus, OH, 2007

Jin Nam, Bjoern Rath, John Lannutti, Sudha **Agarwal**. A Novel Electrospun PCL Scaffold for the Analysis of Cellular Responses to Biomechanical Forces. TERMIS, Toronto, CA, 2007

Nam J, Rath B, Lannutti J, **Agarwal S.** A Novel Electrospun PCL Scaffold for the Analysis of Cellular Responses to Biomechanical Forces. TERMIS, Toronto, CA. 2007.

Danen S. Sjostrom, Thomas J. Knobloch, Shashi Madhavan, **Agarwal S.** Mechanical signals generated by appropriate physical therapies can prevent fibrocartilage degradation and induce repair in TMJ disorders. TMJ meeting, 2007.

Anghelina M, Madhavan S, Huang Y, Wypasek E, **Agarwal S.** Biomechanical Signals Block I-Kappa B Kinase Activation For Their Sustained Anti-Inflammatory Effects On Articular Chondrocytes. Orthopaedic Research Society, California, 2007

Chandran R, Knobloch T.J, **Agarwal S.** Biomechanical Signals Regulate Myogenic Gene Expression in Skeletal Myoblasts, OSU – College of Dentistry, 2007

Gailey D, Knobloch L, Burns J, Azer S, Seghi R, **Agarwal S,** Kerby R. Degree of Conversion of Posterior Composite Resins. American Association of Dental Research, Seq 219, # 2057, Orlando, FL, 2006.

Sjostrom D, Knobloch TJ, **Agarwal S.** Appropriate physical therapies prevent degradation and induce repair in TMJDs. American Association of Dental Research, Seq 143, # 1274, Orlando, FL 2006.

Madhavan S, Dossumbekova A, Anghelina M, **Agarwal S.** NF-kB Transcription Factors Mediate Mechanosignaling in Articular Chondrocytes. Keystone Symposium – NFkB, Banff, Canada 2006.

Gassner R, Ferretti M, Srinivasan A, Deschner J, Salter R, **Agarwal S.** Inflammatory Response of Continuous Passive Motion and Immobilization in Arthritic Knee. 12th ESSKA (European Society of SportsTraumatology, Knee Surgery, and Arthroscopy) 2000 Congress Abstract book p123. (www.esska2006.com), 2006.

Gassner R, Ganta S, Piesco N, **Agarwal S.** Effects of Mechanical Signalling and Bone Tissue Engineering. 3rd Tissue Engineering Symposium, Tampere Finland. Abstractbook p4, 2006.

Wypasek E., Rath-Deschner B., Angelina M., Deschner, J., **Agarwal S.** Erk1/2 And C-Jun Kinases Are Regulated By Mechanical Loading In Fibrochondrocytes Of Temporomandibular Joint (TMJ). Orthopaedic Research Society, Trans Vol.31, # 1013, Chicago, IL, 2006.

Madhavan S, Deschner J, Liu Z. J, King G. J, **Agarwal S.** Biomechanical Signals Regulate Proinflammatory and Osteogenic Gene Expression in PDL. American Association of Dental Research, Seq 204, # 1759, Orlando, FL, 2006.

Sjostrom D, Deschner J, **Agarwal S.** Modulation of the Beta-Catenin Pathway by Biomechanical Signals in TMJ. American Association of Dental Research, Seq 93, # 0764, Orlando, FL, 2006.

S. Madhavan, J. Deschner, Z. J. Liu, G. J. King, S. **Agarwal** Biomechanical Signals Regulate Proinflammatory and Osteogenic Gene Expression in PDL. J Dent Res 85(Spec Is B):1759, 2006.

Sjostrom D, J Deschner, **S Agarwal.** Modulation of The Beta-Catenin Pathway by Biomechanical Signals in TMJ. J Dent Res 85(Spec Iss B):0764, 2006.

Madhavan S, Dossumbekova A, Anghelina M, **Agarwal S.** NF- κ B Transcription Factors Mediate Mechanosignaling in Articular Chondrocytes. Keystone Symposium – NF κ B, Banff, Canada, 2006.

Sjostrom D, Deschner J, **Agarwal S.** Modulation of The b-Catenin Pathway by Biomechanical Signals in fibrochondrocytes of TMJ. Keystone Symposium – Wnt, Salt Lake City, Utah, 2006.

Deschner J, Rath B, **Agarwal S.** Sustained Anti-Inflammatory Effects Of Tensile Forces In Rat Fibrochondrocytes. Orthopaedic Research Society, Trans Vol.31, # 0025, Chicago, IL 2006.

Rath B, Anghelina M, Madhavan S, Deschner J, Ferretti M, Srinivasan A, Gassner R, Salter R B, **Agarwal S.** Anti-Inflammatory Effects Of Biomechanical Signals Are Mediated By Interleukin-10. Orthopaedic Research Society, Trans Vol.31, # 0266, Chicago, IL 2006.

Gassner R, Shree A, Seyedain A, Piesco N, **Agarwal S.** Effects of Mechanical Signalling and Bone Tissue Engineering. 3rd Tissue Engineering Symposium, Tampere, Finland. 2006.

Wang Z, Deschner J, Perera P, **Agarwal S.** Biomechanical signals in cartilage repair. Tissue Engineering Society International. TERMIS, Shanghai, China, 2005

Deschner J, Perera P, Wang Z, Lannutti J, **Agarwal S.** Regenerative potential of biomechanical signals in cartilage repair: a molecular analysis *in vitro*. Tissue Engineering Society International. Shanghai, Shanghai, China, 2005

Rath-Deschner B, Anghelina M, Madhavan S, John A, Deschner J, Ferretti M, Srinivasan A, Gassner R, Salter RB, **Agarwal S.** Rapid induction of interleukin-10 by mechanosignaling in articular chondrocytes. Gordon Research Conference. Cartilage Biology and Pathology. Italy, 2005

Sowa G, Deschner J, Ferretti M, Asha J, **Agarwal S** Mechanical strain exerts an antiinflammatory effect on intervertebral disc fibrochondrocytes. World Spine 2005

Ferretti M, Deschner J, Yin C, John A, Rath-Deschner B, He L, Wypasek E, **Agarwal, S.** Mechanical Loading Changes The Inflammatory Phenotype Of Meniscal Cells. Orthopedic Research Society. Trans Vol. 30, # 0082. Washington DC, 2005.

Ferretti M, Srinivasan A, Deschner J, Baliko F, Gassner R, Salter R.B, **Agarwal S.** Continuous Passive motion reverses cartilage degradation in arthritis by inhibiting synthesis of proinflammatory mediators. Orthopaedic Research Society, Trans Vol.30, # 1030, Chicago, IL, 2005.

Gassner, R., Piesco, N., Deschner, J., Salter, R., **Agarwal, S.** Molekularbiologische Aspekte für das Kiefergelenk: Mechanische Stimuli. *Acta Chirurgica Austriaca* (suppl 203) 37: 27, 2005.

Andonian C, Deschner J, John A, Rath-Deschner B, **Agarwal S.** Mechanical loading inhibits the inflammatory responses in articular cells American Association of Dental Research, Seq 247, #2272, Baltimore, MD, 2005.

Deschner J, Rath-Deschner B, **Agarwal S.** Regulation of MMP and TIMP expression in TMJ disc cells. American Association of Dental Research, Seq 296, #2670, Baltimore, MD, 2005.

Rath-Deschner B, John A, Deschner J, **Agarwal S**. Possible role of IL-10 in TMJ repair by motion-based therapies. American Association of Dental Research, Seq 247, #2274, Baltimore, MD, 2005.

Sjostrom D, Deschner J, Rath-Deschner B, John A, **Agarwal S**. Mechanical strain regulates N-cadherin and Wnt7a in articular cells. American Association of Dental Research, Seq 271, #2554, Baltimore, MD, 2005.

Snider H, Deschner J, Perera P, Agarwal S. Effects of biomechanical strain on skeletal muscle cells. American Association of Dental Research, Seq 247, #2275, Baltimore, MD, 2005.

Wypasek E, Deschner J, Ferretti M, John A, Rath-Deschner B, **Agarwal S**. Inhibition of IL-1-stimulated RANK-L expression by biomechanical strain. American Association of Dental Research, Seq 271, #2551, Baltimore, MD, 2005.

Ferretti M, Srinivasan A, Baliko F, Deschner J, Gassner R, Salter R, **Agarwal S**. Continuous Passive Motion Suppresses The Inflammatory Process In Arthritic Menisci. American Academy of Orthopaedic Surgeons, Washington DC, 2005.

Rath-Deschner, B., Anghelina, M., Madhavan, S., John, A., Deschner, J., Ferretti, M., Srinivasan, A., Gassner, R., Salter, R.B., **Agarwal, S**. Rapid induction of interleukin-10 by mechanosignaling in articular chondrocytes. Gordon Research Conference 2005.

Ferretti M, Deschner J, Yin C, John A, Rath-Deschner B, He L, Wypasek E, **Agarwal, S**. Mechanical Loading Changes The Inflammatory Phenotype Of Meniscal Cells. Orthopedic Research Society. Trans Vol. 30, # 0082. Washington DC, 2005.

Ferretti M, Srinivasan A, Deschner J, Baliko F, Gassner R, Salter R.B, **Agarwal S**. Continuous Passive motion reverses cartilage degradation in arthritis by inhibiting synthesis of proinflammatory mediators. Orthopaedic Research Society, Trans Vol.30, # 1030, Chicago, IL, 2005.

Ferretti M, Deschner J, **Agarwal S**. Degenerative process of articular cartilage congress on cartilage repair and regeneration. Congress on cartilage repair and regeneration. Sao Paulo, Brazil 2005

Deschner J, Ferretti M, **Agarwal S**. Molecular basis of continuous passive motion in the cartilage, Application of basic sciences in the orthopedics practice –“ to remember what was forgotten and to learn what we do not know”, Congress on cartilage repair and regeneration. Sao Paulo, Brazil 2005

Agarwal S, Biomechanical properties of the cartilage; the importance of the extracellular matrix congress on cartilage repair and regeneration, From Basic Science to Arthroplasty. Sao Paulo, Brazil 2005

Agarwal S, Healing of the cartilage with continuous passive motion: mechanism of action. Congress on cartilage repair and regeneration. From Basic Science to Arthroplasty. Sao Paulo, Brazil 2005

INVITED SEMINARS

2000 Bone Repair: Present and Future Trends. Sponsored by Posner Exchange,

- Program at the Hadassah University School of Dental Medicine, Jerusalem, Israel.
- 2000 Biodegradability of biocompatible macroporous peptide based urethane polymers. Pittsburgh Orthopedic and Tissue Engineering Symposium.
- 2000 Intracellular mechanisms of anti-inflammatory actions of tensile strain. Department of Surgery, University of Pittsburgh School of medicine.
- 2001 Workshop on, Building Research Capacity in Rehabilitation Science. NIH, Bethesda MD.
- 2002 Grand Rounds, University of Pittsburgh School of Dental Medicine.
- 2002 McGowen institute of Regenerative Medicine, University of Pittsburgh.
- 2002 Gordon Conference on Musculoskeletal Biology and Bioengineering, Andover, NH.
- 2002 McGowen institute of Regenerative Medicine, University of Pittsburgh.
- 2000 Intracellular mechanisms of anti-inflammatory actions of tensile strain. Department of Medicine, University of Pittsburgh School of Medicine.
- 2002 Symposium, Frontiers of Rehabilitation Research. University of Pittsburgh/NIH.
- 2003 Eye and Ear Institute, University of Pittsburgh, PA
- 2003 McGowan Institute of Regenerative Medicine, University of Pittsburgh, PA
- 2003 American Academy of Physical Rehabilitation Medicine. Chicago 2003.
- 2002 Frontiers of Rehabilitation Research, CURE-SCIENCE program, Univ Pittsburgh.
- 2003 McGowan Institute for Regenerative Medicine, Pittsburgh
- 2004 Biomedical Engineering Program, The Ohio State University, Columbus, OH
- 2005 Cartilage Tissue Engineering: Role of mechanical Signals. DHLRI, Davis Heart and Lung Institute, The Ohio State University College of Medicine.
- 2005 Mechanical Signals in healing. Comprehensive Wound Center Inaugural Conference The Ohio State University College of Medicine.
- 2006 Biomedical Engineering Program, The Ohio State University, Columbus, OH
- 2007 Osteoarthritis Research Society International, Ft Lauderdale
- 2007 International Symposium on Cartilage and Chondrocyte Mechanobiology. Athens, Greece
- 2008 Orthopedics, Hospital for Special Surgery, New York
- 2008 Biomedical Engineering and Orthopedics, Mount Senai Hospital/ City College of New York, New York
- 2008 Department of Biomedical Engineering, The Ohio State University, Columbus, OH
- 2008 Department of Orthopedics, Virginia Commonwealth University, Richmond VA
- 2008 International Symposium of Matrix and Chondrocyte Biology. Copenhagen, Denmark
- 2009 Gordon Conference, Cartilage Biology and Pathology, Les Diablerets, Switzerland
- 2010 Dorothy heart and Lung Institute, The Ohio State University, Columbus, OH
- 2010 Department of Biomedical Engineering, The Ohio State University, Columbus, OH
- 2010 Department of Environmental Medicine & Orthopedics, University of Pennsylvania Medical Center, Philadelphia
- 2010 Symposium, Biomechanics and Inflammation in Health and Diseases of Musculoskeletal System: The Anti-Inflammatory Component of Mechanosignaling. Orthopedic Research Society Annual Meeting, New Orleans, 2010
- 2011 DHLRI, The Ohio State University, Columbus, OH
- 2012 Department of Biology, University of Cincinnati, OH

GRANTS AND PATENTS

PATENTS.

- 1. Medical adhesive:** Serial # 60/355,290 filed February 8, 2002/ formally applied 04/07, Patented, April

2008. University of Pittsburgh. *Commercialized by Cohera Biomedicals, Pittsburgh.*

2. Follistatin-like 3 (FSTL3) as a diagnostic tool and therapeutic agent in bone formation. Provisional patent Applied 2011. The Ohio State University.

CURRENT GRANTS

Mechanotransduction and tissue regeneration. P.I. Agarwal S. Funding agency - Multi-Track Collaborative Pilots, CCTS, The Ohio State University, Funding period Dec 2011 to Feb 2013. Total costs \$ 33,500.

Development of artificial devices for rehabilitation in patients with inflammatory myopathies. P.I. Yi Zhao. Co-investigator Agarwal S (5% Effort). Funding agency: NSF. Funding period: 7.1.09-6.30.13; Direct costs year I \$ 75,000; Total costs \$ 281,250.

Multifunctional Hydrogels as Stem Cell Carriers for Cardiac Therapy. Co-PIs. Guan J. and Agarwal S. Funding agency: NSF. Funding period: 9.15.2010-8.31.2013; Total costs \$ 300,000.

R01AT004922. Massage therapy in eccentric exercise induced muscle weakness. PI: Best T. Co-I: Agarwal, S. Funding period. 08/01/09-07/31/13. Effort. 5%. Funding agency. NIH/NCCAM. Total budget. \$ 1,500,000.

The long term objectives of this grant are to examine the effects of massage therapy on muscle weakness.

Engineering tissue constructs mechanical environments for cardiac regeneration. PI. Jinjuan Guan, Co-PI, Sudha Agarwal. Funding agency. NSF. Total budget \$ 722,000.

GRANTS PLANNED

Mechanotransduction in bone (RO-1). P.I. Sudha Agarwal (25% Effort). RO-1 NIH/NIDCR. Direct costs year I \$ 250,000; TC \$ 1,500,000.

Stress-induced antiinflammatory signals in chondrocytes (RO1). P.I. Sudha Agarwal (25% Effort). NIH/NIAMS. TC \$ 1,525,000.

FSTL3: A biomarker for bone regeneration. (RO-1) Sudha Agarwal (25% Effort). RO-1 NIH/NIDCR. Direct costs year I \$ 250,000; TC \$ 1,500,000.

GRANTS OBTAINED IN THE PAST

Exercise driven molecular mechanisms of joint repair. (RO1 AR48781). P.I. Sudha Agarwal, (20% effort). Funding period 10.1.2002-7.30.2009. (No cost extension year). Funding agency, NIH. TDC 1: \$ 236,000; Total costs \$ 1,542,224. Status: Funded.

Inflammation of the TMJDs: Role of Mechanical Signals. (RO1 DE015399) P.I. Sudha Agarwal. (20% Effort); Funding agency: NIH/NIDR. Funding period: 7.1.03-6.30.10 (No cost extension year); Direct costs year I \$ 250,000; Total costs \$ 1,362,085. Status: Funded.

Mandibular osteoinduction and Mechanotransduction. P.I. Zhongyang Sun (Post doctoral fellowship), Primary Mentor. Sudha Agarwal. Funding Agency American Orthopedic Society; Total funds \$ 125,000; Funding period 01.07.08 to 30.06.10. Status Funded.

Stress-induced antiinflammatory signals in chondrocytes (RO1 AT00646- Competing renewal). P.I. Sudha Agarwal (25% Effort). NIH/NIAMS. 09/02-08/08 (No cost extension year). Direct costs year I \$ 250,000; TC \$ 1,725,000.

Physical therapies: An anti-inflammatory signal on arthritis. (R21 HD 40939). P.I. Sudha Agarwal. Effort: 20%. Period: 9.1.01-8.31.04. (No cost extension year) Funding agency: NIH. TDC year I: \$ 150,000; Total costs: \$ 654,219. Status: Funded.

Stress-induced anti-inflammatory signals in TMJ (R15 DE13799). P.I.: Sudha Agarwal. Effort: 10%; Funding period: 7.01.00- 6.30.02. Funding Agency: NIH/NIDR. Total costs year 1: 73,875; total Costs: \$147,750. Status: Funded. This grant is in its no cost extension year.

K-12 , P.I. Gwen Sowa, Primary Mentor Sudha Agarwal, Effort 5% Funding Agency: NIH/NICHHD Funding Period: 7.1.04 – 6.30.07; TDC per year \$ 91,000. Status: Funded, transferred to the University of Pittsburgh in 2005.

Individual Predoctoral Dental (F30 DE017269). P.I. Sjostrom, Danen NRSA fellow; Primary Mentor Sudha Agarwal. Period: 9.1.05 – 8.31.08. Funding agency: NIH/NIDR, Funding period 2005-2008 Total costs: \$45,204 per year. Status: Funded.

Atomic Force Microscope. P.I. Agarwal G. Co-Investigator S. Agarwal. S10 RR21199. Funding period. 2006. Total budget \$ 304433. Funding agency, NCR/NIH, Funded.

Small Laboratory Animal Imaging: High Resolution Microcomputed Tomography. P.I. Ramiro E. Toribio Co-I Sudha Agarwal. 5% Effort. NCR/NIH. Funded, \$457,800.00

Gene Therapy for Periodontal Engineering in Osteoporosis patients (58-3148-4-044). P.I. Sudha Agarwal. Effort 5%; Period: 9.1.04 – 8.31.08. Funding agency: USDA Foreign Ag Serv. TDC \$20,000. Status Funded.

TEACHING

UNDERGRADUATE AND GRADUATE LEVEL COURSES:

Northeastern University, Boston

Georgetown University, Washington

Johns Hopkins Univ. Sch Medicine, Baltimore

Univ. Maryland Dental School, Baltimore

Univ. Pittsburgh School of Medicine

Univ. Pittsburgh School of Dental Medicine

Cell physiology, Histology, Human physiology,
Human Anatomy, Plant Physiology.

Immunology, Biochemistry

Immunology

Immunology/Microbiology

Problem Based Learning in Cell Metabolism

Immunology/Microbiology, Pathobiology

- 1995 - 2003 Course Director: Pathobiology I (Graduate), DSMIC 2281; 2 credits. UPSDM
- 1995 - 1998 Course Director: Dental Microbiology (Predoctoral), DSMIC 5212; 5 credits. UPSDM
- 1998 - 2000 Course Director: Dental microbiology Immunology, DSMIC 1241; 4 credits. UPSDM
- 1995 - 2003 Immunology part of Dental Microbiology (Predoctoral), DSMIC 5212; 5 credits. UPSDM
- 1992 - 2003 Graduate Faculty: University of Pittsburgh School of Dental Medicine.
- 1992 - 2003 Graduate Faculty: University of Pittsburgh School of Medicine.
- 1994 - 2003 Guest lecturer in many courses, lectured on wound healing, cytokines, TMJ, Bone physiology, Cell physiology, etc.
- 1995 - 2003 Problem based learning, Anatomy, Physiology, Immunology, Microbiology, University of Pittsburgh School of Dental Medicine.
Residency Literature Review seminar, University of Pittsburgh School of Dental Medicine.
- 2007 - present Physiology and function of Bone, Graduate course, 3 Cr (Team taught)
- 2005 - present Craniofacial Embryology and Development. 3 Cr (1 lecture)
- Evaluations of Teaching: Mostly above 4.0, some between 3.0 and 4.0 on a scale of 5.

Participation in CE courses, Workshops and other Teaching

Attended. Clinical Research, regulations and techniques essential for clinical research; Chemical Hygiene and Safety; Win-win discussions; Problem Based Learning Implementation in Medical education; Development and management of teams in academics; On-line course development; Win-win discussions; Recombinant DNA technology; Laser capture dissections methods for microgenomic analysis; Proteomic techniques and biomarkers. Microarrays in human health and Disease 2006, Micro RNA applications 2007, Animal models of Osteoarthritis 2007, New approaches in cartilage research 2007.

Presented. Rehabilitation research updates in the treatment of patients with degenerative joint disease. American Academy of Physical Medicine and Rehabilitation, Chicago, 2003.

MEMBER/MAJOR ADVISOR THESIS COMMITTEE FOR M.S./PH.D.

- 1997- 2000 Major advisor, Effect of mechanical strain on periodontal ligament cell functions during inflammation. Masters thesis by Natalie Pacora, D.M.D., Department of Orthodontics, University of Pittsburgh School of Dental Medicine.
- 1996-2000 Major advisor, Tissue Engineered Autografts for Bone Repair. Masters thesis by Ali Seyadin, D.M.D., Department of Periodontics, University of Pittsburgh School of Dental Medicine.
- 1996-2000 Major advisor, Analysis of PLA/PGA-induced foreign body reactions during osteogenesis. Masters thesis by James D. Manning, D.M.D., Department of Periodontics, University of Pittsburgh.
- 1999-2000 Member Ph. D. thesis committee, Development of Efficient Methods for gene delivery *in vitro* and *in vivo*. Ph. D. thesis by Feng Liu, Department of Pharmaceutical Sciences, School of Pharmacy, University of Pittsburgh.
- 2000-2003 Major advisor, Mechanisms of actions of tensile strain on PDL cell functions. Masters thesis by Manjari Manoharan, D.M.D., Department of Orthodontics, University of Pittsburgh School of Dental Medicine.

- 2000-2003 Major advisor, Biocompatibility of peptide based urethane polymers. Masters thesis by C.N. Deepak D.M.D., Department of Periodontics, University of Pittsburgh School of Dental Medicine.
- 2001 - 2002 Member, Thesis committee, An in vitro evaluation of the cytotoxicity of Propolis on PDL cells and Pulp fibroblasts. Abdulaziz Alshaher, Department of Endodontics, University of Pittsburgh.
- 2004 - 2009 Member, Ph.D. Thesis Committee, Neutrophil function in periodontitis. Pooja Manney, College of Graduate Studies, The Ohio State University, Columbus, OH.
- 2004 - 2007 Member, Ph.D. Thesis Committee, Transitional knock-outs for IL-1 receptor II and inflammation of the central nervous system. Howe Wang. College of Graduate Studies, The Ohio State University, Columbus OH.
- 2004 - 2007 Major Advisor, Ph.D. Thesis Committee, Regulation of NF-kB signaling pathway by Mechanical Signals in chondrocytes. Shashi Madhavan. College of Graduate Studies, The Ohio State University, Columbus OH.
- 2004 - 2007 Major Advisor, Ph.D. Thesis Committee, Mechanical signals in muscle differentiation. Ravi Chandran. College of Graduate Studies, The Ohio State University, Columbus OH.
- 2004 - 2007 Member, PhD Thesis committee, IL-1 receptors in brain endothelium. Hao Zhang, College of Graduate Studies, The Ohio State University, Columbus OH.
- 2004 - 2007 Member, M.S. Thesis committee, DPP2 expression and Wnt signaling during Palate Development. Na Wei, College of Graduate Studies, The Ohio State University, Columbus OH.
- 2007 - 2010 Major advisor, Ph.D. thesis, Mechanotransduction in Endothelial Cells: Cell Growth, Angiogenesis and Wound Healing. Jei Liu. College of Graduate Studies, The Ohio State University, Columbus OH.
- 2005 - 2010 Major advisor, Ph.D. thesis, Mechanotransduction in TMJ: Wnt signaling in fibrocartilage inflammation. Danen Sjostrom. College of Graduate Studies, The Ohio State University, Columbus OH. NRSA (NIH) fellowship recipient.

MAJOR ADVISOR POST DOCTORAL FELLOWS/VISITING SCIENTISTS/JUNIOR FACULTY

Year	Name	Position held in my lab	Present Position
2000-2001	Dr. Raymond Ganster, PhD,	Assistant Professor,	Assist. Prof. University of Hong Kong
2000-2003	Dr. Sudhakar R. Ganta, PhD,	Post-doctoral Fellow,	Chemist, University of Michigan
1997-1998	Dr. Robert Gassner, Md, DMD, PhD,	Visiting faculty,	Associate Professor, Oral and Maxillofacial Surgery, University of Innsbruck, Austria
2001-2003	Dr. Cynthia Hoffman, Pharm D,	Post-doctoral Fellow,	Dept of Oral Medicine and Pathology

2002-2003	Dr. Jing Hu, DMD, PhD, Visiting Scientist, Professor, Dept of Oral and Maxillofacial Surgery, University of Cheng Du, China
2000-2000	Dr. Wen Jin Li, PhD, Post-doctoral Fellow, Dept of Microbiology/Biochemistry
1998-2002	Dr. Ping Long, MD, Research Associate, University of Pittsburgh Administration
2000-2002	Dr. Anuradha Singhal, MD, Research Assistant Professor, Surgical Pathologist, Texas Health Science System, Dallas
2000-2003	Dr. Anupam Verma, MD, Post-doctoral Fellow, Internal Medicine
2002-2002	Dr. Jian Ying Zhang, PhD, Post-doctoral Fellow, Chemical Engineering, Univ Pittsburgh
1998-1999	Dr. Xu Zhongfa, MD, PhD, Post-doctoral Fellow, Professor Department of Surgery, China
2000-2003	Dr. Robert Gassner, MD, DMD, PhD, Visting Professor, Dept Oral and Maxillofacial Surgery
1997-2000	Dr. Feng Liu, MD, Post-doctoral Fellow, Dept Pathology, Univ Shanghai, China
1997-2000	Dr. Charu Chandra, DMD, Post-Doc, Periodontist, Pittsburgh
1996-2000	Dr. Al Seyedain, DDS, Post-doctoral fellow, Associate Professor, University of Pittsburgh, PA
2003-2005	Dr. Birgit Rath, DDS/PhD, Post-doctoral Fellow, Assistant Prof Orthodontist, Univ of Bonn, Germany
2003-2005	Dr. Mario Ferretti, MD, Post-Doctoral Fellow, Assistant Professor, Orthopedics, Univ of Sao Paulo, Brazil
2003-2005	Dr. Gwen Sowa, K-12 MD/PhD, PM&R, Assistant Professor, Physical Medicien and Rehabilitation, Univ of Pittsburgh
2003-2005	Dr. Abiraman Srinivasan, PhD, Post doc, Bioengineering, Carnegie Mellon
2003-2006	Dr. James Deschner, DDS/PhD Visiting Professor, Associate Professor, University of Bonn, Germany
2003-2007	Dr. Mireal Anghelina, MD, Research scientist, The Ohio State Univ, Columbus
2003-2005	Dr. Lingli He, DDS, Research scientist, Oral Biology, The Ohio State Univ, Columbus
2005-2007	Dr. Yan Huang, PhD, Chem Engg, Post-doctoral fellow, Oral Biology, The Ohio State Univ
2004-2006	Dr. Ewa Wypasek, PhD, Mol Biol, Post-doctoral fellow, Assistant Prof, Krakov University, Poland
2005-2007	Dr. Anar Dossumbekova, MD/PhD, Post doctoral fellow, Dept of Cardiology, Univ of Chicago, Chicago
2006-2008	Dr. Bjoern Rath, MD/PhD, Post doctoral fellow, Assistant Professor Orthopedics, University of Regensburg, Germany
2006-2008	Dr. Agata Zyga, PhD, Molecular Biol, Post doctoral fellow, University of Missouri
2006-2010	Dr. Yi Zhao PhD, Assistant Professor, Biomedical Engineering, OSU, Columbus, OH
2007-2010	Dr. Zhongyang Sun, DMD/PhD, Assistant Professor, Orthodontics, OSU, Columbus, OH
2007-2010	Dr. Ajit Chowdhary, PhD, Assistant Professor, Orthopedics and Sports Medicine, OSU, Columbus, OH
2006-2011	Dr. Jin Nam, PhD, Material Science Engineering, Post doctoral fellow, Oral Biology, OSU

ADVISOR PREDOCTORAL/DOCTORAL STUDENT RESEARCH

Mentored research projects of more than 35 First Professional and Graduate Students. Some of these students received a number of awards in the research competitions held at National and International Student Research Competitions. All of these students have competed in University of Pittsburgh SDM student research competitions and have received awards /scholarships for their research efforts. More than 95% of the following students have been accepted in well-reputed post graduate residency programs /academic positions.

Mentor for students awarded in National and International Research Competitions:

2011	Ross Gordon	Nominee, Hatton Research Competition		AADR
2010	Jin Nam	Young Investigator's Award, Osteoarth Res Soc Int,		OARSI Brussels
2009	Gwen Sowa	Excellence in Research Writing Award	Am J Phys Med & Rehab	
2009	Jie Liu	Nominee, Hatton Research Competition		AADR
2008	Jie Liu	Young Investigator's Award, Osteoarth Res Soc Int,		OARSI Rome, Italy.
2008	Ryan Branski	Best paper in Basic Science category (2007)		Journal of Voice
2007	Jin Nam	Young Investigator's Award, Osteoarth Res Soc Int,		OARSI FtLauderdale
2006	Danen Sjostrom	Recipient	Hinman Soc. Research Award	Hinman Soc
2006	Shahsi Madhavan	II place	Hatton Research Award	IADR
2006	Shahsi Madhavan	III place	Hatton Research Award	AADR
2005	Heidi Snieder	I place	Basic Science Award	Hinman Soc
2005	Danen Sjostrom	Recipient	F-30, NRSA award	NIH
2004	Gwen Sowa	1 st place	Research Investigator Award	AAPMR
2002	Manju Manoharan	Nominee	Hatton Research Competition	AADR
2002	Adam Schafer	Recipient	AADR Student Research fellowship	AADR
2001	Jamie Ceranansky	Nominee	Hatton Research Competition	AADR
2000	Brian Lorei	II nd place	Hatton Research Award	AADR/IADR
2000	Uma Nair	Ist place	Dentsply Research Comp	AADR
1998	Anne Day	Recipient	Block Travel Fellowship	IADR
1998	Dev Chandra	III place	AADR Dentsply Research Comp	AADR
1997	Dev Chandra	Recipient	Hinman Scholarship	Hinman Soc
1997	Mark A. Fiss	Recipient	AADR Research Fellowship	AADR
1997	Manju Manoharan	Recipient	ADA Dentsply Research Comp	ADA
1996	John Caccamese	Nominee	Hatton Res Competition,	AADR
1996	Steven Krakora	Recipient	Hinman Scholarship	Hinman Soc
1996	Steven Krakora	Recipient	NIDR Summer Scientist Program	NIH
1996	Steven Krakora	Recipient	AADR Research Fellowship	AADR
1995	David Fiero	Recipient	Block Fellowship Award	IADR
1995	J. Carlos Quintero	Recipient	Block Fellowship Award	IADR
1995	John Caccamese	IV place	AADR Dentsply Research Comp	AADR
1995	John Caccamese	Recipient	Hinman Scholarship	Hinman Soc
1994	Ronald Kolodjieg	Nominee	Dentsply Student Research Competition	ADA
1994	Ronald Kolodjieg	Recipient	Hinman Scholarship	Hinman Soc
1994	Greg Kewitt	Nominee	Hatton Research Competition	AADR
1994	Thomas Brady	Recipient	AADR Research Fellowship	AADR
1994	Ronald Kolodjieg	Recipient	Hinman Scholarship	Hinman Soc
1994	Thomas Brady	Nominee	Hatton Research Competition	AADR

1994	Joseph Stofko	Ist place	Dentsply Research Competition	AA DR
1994	J. Carlos Quintero	IInd Place	Dentsply Research Comp	ADA
1993	J. Carlos Quintero	Nominee	Hatton Research Competition	AA DR
1993	David Basi	Nominee	Hatton Research Competition	AA DR
1993	Gregory Kewitt	IV place	Dentsply Research Competition	AA DR
1993	David L. Basi	Recipient	AA DR Research Fellowship	AA DR
1993	J.Carlos Quintero	Recipient	AA DR Research Fellowship	AA DR
1992	Jess A. Gardener	Ist place	Hatton Research Award	IADR
1992	Jaqueline L. Fratto	Recipient	AA DR Research Fellowship	AA DR
1992	Juan Carlos Quintero	II place	Dentsply Research competition	AA DR
1992	Amardeep S. Khara	Recipient	Block Fellowship	IADR
1992	Jaqueline L. Fratto	Recipient	Block Fellowship	IADR
1992	David L. Basi	Recipient	Block Fellowship	IADR
1992	Ann Defour	Graduate	IX Conf Intl Assoc Perio Res, Osaka, Japan.	Res. Award
1992	Jess A. Gardener	II Place	Dentsply Natl Student Res Competition	ADA

Mentoring undergraduate students

1991-2003	Mentor for interns enrolled in QUEST sponsored by University challenge for Excellence Program.
1996-2003	Mentor, Pittsburgh Tissue Engineering Initiative Summer Student Education Program.
1996-2003	Mentor, Summer Internship Training Program for Under grads
1998-2003	Research Mentor, PTEI – Pittsburgh Tissue Engineering Initiative
2001-2003	Mentor, T-35 trainees, University of Pittsburgh School of Dent Med.
2003-present	Mentored at least 3 undergraduate fellows/students per year, OSU College of Dentistry

SERVICE

Editorial Boards

Academic Editor

PLoS ONE

Academic Editor

Frontiers in Craniofacial Biology

REVIEWER FOR JOURNALS

Arthritis and Rheumatism

Biochemica Biophysica Acta.

PLos One (Academic Editor)

Journal of Immunology

BMC Biomedical Material and Medical

Journal of Biological Chemistry

Cancer Research

Wound Repair and Regeneration

Bone

J Applied Physiology

Annals of Biomedical Engineering

J Vascular Research

Oral Microbiology and Immunology

Journal of Dental Research

Clinical & Diagnostic Laboratory Immunology

Natural Immunity

Life Sciences

Lab Investigation

Cytokine

Molecular and Cellular Biochemistry

Journal of Bone and Mineral Research
Tissue Engineering Part 1
Journal of Applied Physiology
Journal of Cell Biochemistry
Stem Cell
Osteoarthritis and Cartilage
Experimental Gerontology
American Journal of Pathology
Biorheology
Acta Biomaterialia

Cell Biology International
Biomaterials
Nitric Oxide: Biology and Chemistry
American Journal of Dentistry
American Journal of Physiology, Cell Physiology
Journal of Orthopedic Research
Cells Tissues Organs
Langmuir
Tissue Engineering Part 2

EXTRAMURAL GRANT REVIEWER

STUDY SECTIONS SERVED (since 2004)

Study Section/SEP	Study Section/SEP Name	Meeting Date	SRA Name
ZAR1 -CHW NIAMS	Musculoskeletal Research R13	2012/04/13	Charles Washabaugh
ZAR1 -CHW NIAMS	LRP grants	2012/03/05	Charles Washabaugh
AMS NIAMS	Musculoskeletal Research	2012/02/23	Helen Lin
PRMRP	Orthopedic Research & Translation	2012/02/17	Barbara Muller DoD
2012/01 DSR NIDCR	Craniofacial Research	2011/10/20	Rebecca Miller
ZAR1 -KM NIAMS	Musculoskeletal Research	2011/03/30	Kan Ma
ZAR1 -KM -(M1)NIAMS	Musculoskeletal Diseases	2010/03/30	Kan Ma
ZRR1CR-1 (NCRR)	CTSA-1	2010/02/17	Mohan Vishwanathan NCRR)
P2RMIS (DOD)	Orthopedic Research	2010/02/12	Barbara DiVenney
ZAR1 -KM -NIAMS	Musculoskeletal Diseases	2010/04/30	Kan Ma
ZAR1 -KM -NIAMS	Musculoskeletal Diseases	2010/11/30	Kan Ma
ZRR1 -CR -1	Centers of Res Translation (CORT)	2010/02/17	Mohan Vishwanathan NCRR)
ZAR1 EHB-F (M2) 2	P30 ARRA	2009/07/28	Eric Brown
ZRG1 MOSS-C	Challenge Grants Panel 21	2009/07/21	Rajiv Kumar
NIBIB	MTE Study Section	2009/06/01	JEAN SIPE
NIDCR	Special Emphasis Panel DSR	2009/02/19	KAN MA
NIAMS ZAR1 KM-D	Special Emphasis Panel	2009/04/30	MOHAN KUMAR
ZAR1 CHW-G (M1)	Musculoskeletal Diseases	2008/11/06	WASHABAUGH, CHARLES
MTE	Musculoskeletal Tissue Engineering Study Section	2008/10/13	SIPE, JEAN
ZAR1 CHW-H (A1)	Loan Repayment Program	2008/04/30	WASHABAUGH, CHARLES
ZDE1 MK (27)	Review R21/K awards	2008/03/28	KELLY, MARY
ZDE1 MK (28)	Review R21/K awards	2008/03/27	KELLY, MARY
ZAR1 EHB-H (M1)	Review R 30s	2008/03/25	BROWN, ERIC
AMS	NIAMS Special Grants Review Committee	2008/02/28	LIN, HELEN
ZAR1 EHB-H (M1)	Small Research Grants Review	2007/03/26	BROWN, ERIC
ZRR1 RI-5 (01)	RCMI / C.O.B.R.E	2006/11/09	MURTHY, MAHADEV
AMS	NIAMS Special Grants Review Committee	2006/11/02	LIN, HELEN
ZAR1 EHB-M (O1)	Review RO3s	2006/07/31	BROWN, ERIC
DSR	NIDCR Special Grants Review Committee	2006/06/15	KING, LYNN

Other National and International Grants Review Panels

- Department of Defense, *Peer Reviewed Medical Research Program* (Orthopedics) 2009-present
- Office of Research, University of Kuwait, Kuwait. 2004-present

- Delta Dental Research Foundation, 2005-present
- Arthritis Research Campaign, United Kingdom, 2004-present
- Am Soc Bone and Mineral Research (ASBMR) 2006, 2007
- Swiss Science Foundation, Berne, Switzerland 2006
- Science and Technology Development Program – IDG Grants, North Carolina Science and Technology Development Program, 2004
- Ohio State University, Heart and Lung Institute (DHLRI) Grants Review Committee (2006-2009)

PROFESSIONAL ORGANIZATIONS SERVED

Orthopedic Research Society Abstract reviews and assignments	2004 - present
Osteoarthritis Research Society International, Abstract reviews and assignments	2004 - present
American Society for Bone and Mineral Research, Grant reviews.	2003 – present

COMMITTEES SERVED

UNIVERSITY OF PITTSBURGH

1991 - 2003	Member, Basic Science Advisory Committee, University of Pittsburgh Cancer Institute.
1992 -2003	Member, Pittsburgh Cancer Institute.
1992 -2003	Member, Pittsburgh Genetics Institute.
1992 - 2003	Member, Several Search Committees for Chairman and faculty, University of Pittsburgh
1992 - 2003	Ad Hoc Promotion and tenure committees for School of Medicine and School of Dentistry.
1992 - 2003	Several search committees for faculty appointments at the School of Dental Medicine.
1994 -2003	Member, Speaker’s Bureau.
1994 -2001	PCI Continuing Education Out Reach Program.
1994 -2001	Member student admissions interviews
1995 -2003	Member, Review committee for Competitive Medical Research Fund, School of Medicine.
1995 -2003	University Challenge for Excellence Program.
1995 -2003	Member, Several Tenure/promotion Committees, Professor, Oral and Maxillofacial Surgery.
1996 - 2003	Member, Pittsburgh Tissue Engineering Initiative.
1997 - 2003	Member, Space Allocation Committee, Division of Oral Biology.
1997 - 2003	Ad-hoc reviewer of patents for Technology Transfer Committee.
1997 - 2003	Member, UPCI cell Program.
1998 - 2003	Committee for Student Research Honors Program.
1998 -2003	OMSF student research award judging committee.
1999 - 2000	President, AADR/IADR, Pittsburgh Chapter.
1999 - 2003	Grant reviewer, Central Medical Research Fund, University of Pittsburgh
2000 - 2003	Patent reviewer, Office of Technology Management, University of Pittsburgh.
2000	Task Force on research, SDM.
2001	Grant reviewer, Pittsburgh Tissue Engineering Initiative, Pittsburgh
2000	Member, Committee for Non-tenured Faculty Promotions and Appointments

THE OHIO STATE UNIVERSITY

2005-2010	Member, Distinguished Scholar Award Committee, The Ohio State University
2005	Search Committee, Special Interest Professorship in Biomedical Engineering, College of Engineering, The Ohio State University.

2005	Accreditation Committee, Basic Sciences, College of Dentistry
2006/07	Heart and Lung Institute (DHLRI) misc, faculty recruitment, Grants Review, Research Day Judge etc.
2007-2009	Judge Daneman Research Forum, Clinical Excellence Day, and Research excellence day.
2006-2011	Local Scientific Advisory Committee, Mathematical Biology Institute. OSU

CURRENT RESEARCH INTERESTS

The focus of my lab is in the areas of mechanobiology/bioengineering of cartilage and bone. Briefly, we are involved in the fundamental research and translational studies through:

- (i) Comprehensive understanding of the mechanotransduction pathways at the cellular and subcellular level that are involved in enhancing repair and regeneration of diseased and healthy cartilage and bone.
- (ii) Identification of molecules involved in the tissue responses to mechanical forces and translate these findings for the treatment of joint/bone disorders.
- (iii) Development of non-invasive methods to treat joints afflicted with arthritic diseases.
- (iv) Application of quantitatively optimal mechanical signals and mediators involved in mechanosignaling to repair/reconstruct cartilage and bone following thorough understanding of the effects of mechanical forces on the cartilage and bone.

RESEARCH SUMMARY

For centuries, exercise is known to promote health. Only recently it is becoming clear that mechanical forces control a highly concerted series of biochemical events that direct many homeostatic functions of the body. This mechanoresponsiveness is especially striking in joints, where mechanical loading elicits reparative and regenerative effects. Despite this well accepted phenomenon, how exercise drives mechanoactivated joint repair is little understood. Recently, we have provided evidence that mechanical forces of physiological magnitudes are potent anti-inflammatory and reparative signals in chondrocytes and osteoblasts as well as in cartilage and bone. These signals suppress proinflammatory gene induction by inhibiting NF- κ B signaling cascade via TAK1, a kinase upstream of signalosome that controls NF- κ B nuclear translocation. Furthermore, mechanical signals act as potent regenerative signals and induce matrix synthesis via induction of transcription factors like Sox-9 in the cartilage and Runx-2 in the bone. We are now extending these studies to examine the signal transduction pathways that are important in tissue regeneration as well as curbing the inflammation, i.e., Wnt/beta-catenin, SMAD, and Akt signaling cascades.

On the other hand, the ongoing studies have demonstrated that exercise induces factors critical in bone remodeling. Our longterm goal is to understand their mechanisms of actions and take these basic science findings to the clinic via translational studies through collaborations with physicians, bioengineers and scientists. With the advancements of technologies for tissue repair and tissue engineering, identification of the molecules that enhance tissue's ability to self-regenerate are quite important. These molecules once delineated can then be applied in an effective manner to augment regenerative capacity of diseased and aging cartilage, as well as allow better integration of tissue engineered transplants, to repair bone afflicted with arthritic diseases.