Grants, Contracts and Foundation Support since 1990 (Total all categories = $ 7,319,776.-)

Date	Agency and Project Title	Role
2018 - 23	DoD/ CDMRP A Novel Biomimetic Scaffold Design that Accelerates Long Bone Segment Defect Regeneration	**PI**
2018	NSF/WAESO **Total of 8 WAESO student support grants** awarded to study various aspects of tissue engineering cartilage, bone and in vivo load measurement	**PI**
2017	NSF/WAESO **Total of 8 WAESO student support grants** awarded to study various aspects of tissue engineering cartilage, bone and in vivo load measurement	**PI**
2017	NSF/WAESO **WAESO Research Presentation Travel (RPT) grant** awarded to support travel to National Roles Conference, Washington DC.	**PI**
2016	NSF/WAESO **Total of 9 WAESO student support grants** awarded to study various aspects of tissue engineering cartilage, bone and in vivo load measurement	**PI**
2016	NSF/WAESO **WAESO Research Presentation Travel (RPT) grant** awarded to support travel to National Roles Conference, Washington DC.	**PI**
15 to 18	NIH- NIAMS 1R21AR065732-01A1 Ultrasound Elasticity Imaging for Gauging Severity of Posterior Tibial Tendon Disorder, Co-PI's Russ Witte and Dan Latt	**Co-investigator**
10 to 15	NSF/WAESO **Total of 63 WAESO student support grants** awarded to study various aspects of tissue engineering cartilage, bone and in vivo load measurement	**PI**
12 to 14	NSF/ MGE@MSA-AGEP Postdoc & Bridge Doctoral Support 1 BME GIDP student supported with award to work on PhD Maria Teresa Velez – PI	**Co-Investigator**
11 to 13	NIH- NIAMS: National Institutes of Health New Hip Fracture Risk Prediction Tool Based on Common Predictors and Hip Geometry Zhao Chen - PI	**Co-Investigator**
09 to 13	NSF**:**(National Science Foundation) SENSORS: In Vivo Joint Regeneration Monitoring System to be Able to Establish Rehabilitation Approaches during Healing	**PI**

06 to 07	BIO/5 Seed Grant Program The Application of Stem Cells to Joint Reconstruction	**Co-PI**
04 to 08	NSF: SENSORS: An Implantable Joint-Load Sensor, Transmitter and a Portable Reader REU Supplement also awarded in 2004	**PI**
03 to 09	NSF/WAESO **Total of 69 WAESO student support grants** awarded to study various aspects of scaffold development and in vivo load measurement and various aspects of of tissue engineering cartilage and cell loading and various aspects of of tissue engineering cartilage and in vivo load measurement	**PI**
02 to 07	NIH- NIBIB: National Institutes of Health, National Institute of Biomedical Imaging and Bioengineering Sensate Scaffolds for Orthopaedic Tissue Repair RSUM Supplement awarded 2003-04, and 2004-05 and 2005-06	**PI** **PI**
00 to 01	NASA Development of a System for Quantifying in Vivo Bone Strain in Normal and Altered Gravity, Grant - NCC 2 5375 tech Officer J Schonfeld	**PI**
98 to 02	NSF**:** Development and Use of a Telemetrized, CPC Coated Strain Gauge System for Advancing Fundamental Knowledge of Bone Strain in Animals and Humans REU Supplement 1998, 1999, 2000	**PI** **PI**
96-02	NSF/WAESO **Total of 36 WAESO student support grants** awarded to study various aspects of wear and artificial joint design and of various aspects of CPC coated strain gauges and cell culture and cell loading studies	**PI**
92 to 96	NSF**:** Bone Bonding to HA Coated Strain Gauges: Development of a faster bonding coating	**PI**
95	UROP:(University Research Opportunities Program) Analysis of the effect of HA on Bone, VIII	**Mentor/Co-PI**
93	College of Medicine/ NIH Biomedical Research Support Grant: HA coated strain gauge bonding to rodent femora with additional support	**PI**
93	NASA (National Aeronautics & Space Administration): Directors Discretionary Fund for Space Research HA coated strain gauge bonding to rodent femora and in vivo bone strain measurement	**PI**
91-95	NSF/CIMD: **Total of 11 student support grants** Analysis of Bone Strain & Histomorphometry Near Strain Gauges Biomechanics of allografts and Bone Bonding to HA Backed Strain gauges	**PI**
90 to 91	NSF (National Science Foundation)**:** Development of a Strain Gauge Bonding Process Using an HA Coating:	**PI**

Industry Support

14 to 15	Tissue Genesis; **UA07-020** disclosure funding Calcium Phosphate Surfaces to Support Adipose Tissue Derived Cell Proliferation and Differentiation	**Co-Inventor**
12 to 2013	Regencor: Repair & remodeling augmentation of fracture healing using vibration	**Co-PI**
08 to 09	Tissue Genesis; **UA07-020** disclosure funding Calcium Phosphate Surfaces to Support Adipose Tissue Derived Cell Proliferation and Differentiation	**Co-Inventor**
05 to 2006	Genis: Evaluation of a Novel Bone filler with Osteoinductive Characteristics	**PI**
02 to 2003	Arthrocare: A Comparison of the Effects of Ablative Therapy with Shaving on Meniscal Tears	**Co-PI**
00 to 2002	Advanced Ceramics Research [NAVY STTR phase II subcontract]	**Co-Invest**
99 to 2000	Depuy/Acromed/Johnson and Johnson Monitoring Spine Fusion in patients	**Co-PI**
99 to 2000	Depuy/Johnson and Johnson Evaluation of Linear and Volumetric Wear of Retrieved UMWPE Inserts using Laser Scanning	**Co-PI**
99 to 2001	Depuy: Wear Particle Analysis	**PI**
98 to 99	Johnson and Johnson Implant Stiffness and Strain Redistribution for two Hip Designs	**Co-PI**
97 to 98	Johnson and Johnson Implant Stiffness and Strain Redistribution for two Hip Designs	**Co-PI**
96 to 97	Zimmer The Effect of Implant Stiffness on Strain Redistribution at the Implant Distal Tip	**Co-PI**
94 to 99	Depuy: Measurement of Clinically Imposed Loading on a Tibial Tray in Conjunction with the Development of Sensate Artificial Knees	**PI**
93 to 94	Depuy: The Patella-Femoral joint in Artificial Knee Systems	**PI**
91 to 92	Depuy: A Study of Artificial Knee Contact Areas:	**PI**
90 to 91	Osteonics: The Effect of Implant Stiffness on Strain Redistribution of Implant Tip:	
90 to 91	Biomet: Biomechanical effect of allograft placement on femoral perforations:	**PI**

Private Foundations and Major Individual Support
(Foundations - peer reviewed funding)

16 to 17	Estate of Irene Hubbel – ORL support grant	**PI**
15 to 16	The JW Kieckhefer Foundation – 5th continuation of support for hASC study	**PI**
15 to 16	The M.T. Morris Foundation – 4th continuation of support for hASC study	**PI**
14 to 15	The JW Kieckhefer Foundation – 4th continuation of support for hASC study	**PI**
14 to 15	The M.T. Morris Foundation – 3rd continuation of support for hASC study	**PI**
13 to 14	The Barry and Janet Lang Fund	**PI**
13 to 14	The JW Kieckhefer Foundation – support for 3rd stage of hASC study	**PI**
13 to 14	The M.T. Morris Foundation – support for 2nd stage of hASC study	**PI**
13 to 14	The Bess Spiva Timmons Foundation: Scholarship funding for Tissue Engineering Student	**PI**
12 to 13	Irene Lawver - Support for Cartilage Research	**PI**
12 to 13	Grace Berg - Support for Cartilage Research	**PI**
12 to 13	Caroline Lott Jessen Foundation – support for cartilage research	**PI**
12 to 13	The JW Kieckhefer Foundation – 2nd support to start hASC study	**PI**
12 to 13	The M.T. Morris Foundation – 1st support to start hASC study	**PI**
12 to 13	The Abramski Fund	**PI**
11 to 12	Caroline Lott Jessen Foundation – support for cartilage research	**PI**
11 to 12	The JW Kieckhefer Foundation – 1st support for hASC facility conversion	**PI**
11 to 12	The Bess Spiva Timmons Foundation: Scholarship funding for Tissue Engineering Student	**PI**
10 to 11	Caroline Lott Jessen Foundation – support for cartilage research	**PI**
10 to 11	The Bess Spiva Timmons Foundation: Scholarship funding for Tissue Engineering Student	**PI**
09 to 10	The Bess Spiva Timmons Foundation: Scholarship funding for Tissue Engineering Student	**PI**
09 to 10	MTF (Musculoskeletal Transplant Foundation) Cartilage Tissue Engineered to Resurface Osteochondral Allografts	**PI**

00 to 01	The Bess Spiva Timmons Foundation: Testing Implantable Bioactive Polymer-based Bone Grafts Manufactured using Computer-Aided Molding Tools	**PI**
99 to 00	The Bess Spiva Timmons Foundation: Developing Implantable Bone Scaffolding Systems with Sensors	**PI**
98 to 00	Scoliosis Research Society: Monitoring Spinal Fusion in Scoliosis Patients; A biomechanical and *in vivo* study	**PI**
98 to 99	The Bess Spiva Timmons Foundation: A Comparison of the Extent of Polyethylene Wear of Standard and Hylamer Inserts	**PI**
97 to 2000	Whitaker Foundation: Special Opportunity Award Biomedical Engineering Program in Imaging, Modeling and Evaluation of Medical Implants: Co-operative Academic - Industrial Program	**faculty co-invest**
97	Alberta Heritage Foundation; Visiting Scientist Grant Quantification of Influence of Tibial Tubercle Realignment on patellar tracking and joint forces	**Co-PI**
97 to 98	The Bess Spiva Timmons Foundation: Comparison of the Extent of Polyethylene Wear to Wear Debris Derived from Patient Fluids	**PI**
96 to 97	The Bess Spiva Timmons Foundation: A Second Generation Radio Monitored Artificial Knee	**PI**
95 to 96	The Bess Spiva Timmons Foundation: Development of an Artificial Knee with Sensors, which can Monitor Patient Activity by Radio	**PI**
95	Orthopaedic Education and Research Foundation: Resident Res. Grant; Characterization of UHMPE Debris	**Mentor/Co-PI**
94 to 95	Gordon Research Allergy Grant/ Arizona Arthritis Center Morphologic Characterization of Inflammation causing UHMPE Wear Debris in Synovial Fluids in Patients with Total Knee Replacements	**Co-PI**
94 to 95	The Bess Spiva Timmons Foundation: A Computer Simulation of Loading of Plastic Inserts in Artificial Knees	**PI**
94	Hewlett Packard Foundation Grants: Grant for Communications hardware for Workstation	**PI**
93 to 94	The Bess Spiva Timmons Foundation: A Contact Pressure Analysis of the Natural Patella Femoral Joint,	**PI**

93	Hewlett Packard Foundation Grants: Equipment Grant for Color Graphics Workstation for FEM modeling	**PI**
92	Orthopaedic Education and Research Foundation: Laboratory Progress Grant	**Co-PI**
91	Hewlett Packard Foundation Grants: Equipment Grant for Faxitron, High resolution Xray unit	**PI**