

**SUMMARY TOTALS**

Clinical: 80	Translational: 20	Basic Science: 62
AAU Studies: 8		
<b>Grand Total: 162 Studies</b>		

**CLINICAL STUDIES**

#	Project Title	Description	PI	Sponsor
1.	Stryker ADM Acetabular System Clinical Trial	To evaluate and determine the success rate, defined as absence of postoperative femoral head dislocation, at 10 years with the Restoration ADM X3 Acetabular System.	Aggarwal	Stryker Orthopaedics
2.	Stryker Triathlon Cone TKA Revision Study	The primary objective is to evaluate the success rate of the Triathlon Tritanium Cone Augments with the Triathlon TS Total Knee System at 2 years postoperative, defined as absence of revision of the Femoral Cone Augment or Tibial Cone Augment for aseptic loosening when compared against published results for other revision knee systems.	Aggarwal	Stryker Orthopaedics
3.	Biomarkers for Osteoarthritis	The purpose of this study is to investigate the changes which occur in diseased knee tissue and to compare these findings to other patients of the same age.	Keeney	DOS
4.	ATTUNE	The primary objective of this clinical investigation is to evaluate functional responder rates with objective performance criteria of participants implanted with the ATTUNE device.	Keeney	Depuy Synthes
5.	SDOH for OA	To identify relationships for social determinants of health with the sequence of treatment options that tend to not be offered to patients who have been diagnosed with osteoarthritis of the knee	Keeney, Leary	DOS
6.	Serum and Urine Biomarkers to Predict Radiographic Osteoarthritis Severity	Identify serum and urine biomarkers that correlate and potentially predict radiographic severity of disease for assistance in disease staging and guidance of clinical treatment.	Stoker, Keeney, C Cook	TLRO
7.	Does patient medication use affect patient biomarkers levels in OA patients	Identify the relationship between patient medication use and the concentration of biomarkers in various fluids	Stoker, Keeney, C Cook	TLRO, DOS
8.	Mizzou Musculoskeletal Biorepository	The purpose of the biorepository is to formalize our current infrastructure and mechanisms for collecting, storing, and analyzing samples (tissues, fluids) for musculoskeletal research.	Cook	DOS

#	Project Title	Description	PI	Sponsor
9.	Outcomes in Patient IQ	Data analytics platform that will be used by our orthopaedic surgeons and researchers to evaluate surgical procedures, improve standard of care, facilitate patient recovery, and future research.	Smith, Cook	DOS
10.	Mizzou BioJoint Lifelong Registry Study	Clinical outcomes registry for all BioJoint patients (knee, hip, ankle, shoulder).	Cook	DOS
11.	Outcomes of Low-Impact Exercise Program for People With Ankle, Knee, and/or Hip Pain or Who Are at Risk for Bone Density Issues	To study how low-impact group exercise classes affect pain scores in patients with knee, hip, and ankle pain.	Cook	DOS
12.	Fresh Meniscal Allograft versus Frozen Tendon Graft for Labral Repair in the Hip	This study seeks to look at patients that have undergone labral reconstruction using either fresh meniscal allograft or frozen tendon allograft, and compare patient reported outcomes, diagnostic imaging assessments, and hip range of motion measures in a head-to-head comparison of these two graft options.	Crist	DOS
13.	Biomarkers in Orthopaedics	Clinical outcomes study that looks at biomarkers in blood, urine, and synovial fluid in patients with various MSK conditions.	Stannard	DOS
14.	Ultrasound Evaluation of Meniscal Transplantation (MAT)	1-year clinical outcomes study, including post-operative ultrasounds for patients receiving either frozen or fresh meniscus transplants to determine meniscal extrusion.	Stannard	DOS
15.	OTA Ankle Fx PROs	Using an approach which combines the patient and surgeon perspectives to identify a uniform consensus-driven, patient-centered outcome recommendation for use with ankle fractures.	Schweser, Leary	DOS
16.	VBT AI	Using statistical or machine learning methods to predict surgical outcomes to optimize patients for VBT surgery and long term functional outcomes.	Boeyer, Leary	DOS
17.	Antibiotics in Pediatric Orthopaedic Percutaneous Surgery (APOPS)	A prospective, randomized study to evaluate if antibiotics affect the outcome after percutaneous surgery for pediatric supracondylar humerus fractures.	Gupta	DOS
18.	AO PedORTHO Registry	A prospective multicenter observational registry of pediatric orthopedic trauma and health outcomes in skeletally immature children	Gupta	AO
19.	Open-Label Long-Term Extension Study to Evaluate the Safety and Efficacy of BMN 111 in Children with Achondroplasia	This is an open-label, phase 3 extension study, to further evaluate the efficacy and safety of BMN 111 until subjects either reach near-final adult height, or for 5 years if near-final adult height occurs prior to the end of the 5-year period.	Hoernschemeyer	BioMarin Pharmaceuticals Inc.
20.	A Multi-center, Longitudinal, Observational Study of Children with Achondroplasia	The purpose of this study is to observe and study the growth velocity, body proportionality, and complications (comorbidities) in children with achondroplasia.	Hoernschemeyer	Ascendis Pharma

#	Project Title	Description	PI	Sponsor
21.	A Phase 2, Multicenter, Double-Blind, Randomized, Placebo-Controlled Trial Evaluating TransCon CNP in Prepubertal Children with Achondroplasia	The purpose of this trial is to determine the safety of once weekly doses of TransCon CNP in prepubertal children with achondroplasia.	Hoernschemeyer	Ascendis Pharma
22.	Harms Study Group	Evaluate the efficacy of non-fusion surgical treatment of Spinal Deformity Correction in Idiopathic Scoliosis.	Hoernschemeyer	Harms Study Group
23.	Healing Together	Examine the lived experience of informal caregivers who take care of patients after biologic knee surgery.	Royse	
24.	BPAQ Activity Outcomes	Longitudinal tracking of preoperative and postoperative outcomes in adolescent idiopathic scoliosis patients treated with Vertebral Body Tethering	Boeyer	None
25.	Pediatric Scoliosis Registry	This is a single center registry for all patients who are being seen and/or treated for scoliosis at all pediatric ages. This includes all forms of scoliosis. The primary goal is to track longitudinal outcomes for all Standard of Care measures.	Boeyer	None
26.	sterEOS in VBT	Identify postoperative changes in vertebral and intervertebral rotation of instrumented and non-instrumented vertebrae in patients treated with Vertebral Body Tethering.	Boeyer	None
27.	Pleural Closure	Determine the influence of pleural closure on perioperative and postoperative outcomes in patients treated with Vertebral Body Tethering.	Boeyer	None
28.	5+ Year VBT Outcomes	Assess mid-term outcomes in patients treated with VBT.	Boeyer	None
29.	TIGER PROTOCOL	Determine the influence of a TIGER Protocol (None vs. V1 vs. V2) on perioperative outcomes following Vertebral Body Tethering	Boeyer	None
30.	Zimmer Growth and Maturation	Evaluate postoperative changes in growth and skeletal maturation in patients treated with a Vertebral Body Tether.	Boeyer, Hoernschemeyer	Zimmer Biomet
31.	Harms Lenke 2As	Evaluate postoperative changes in the compensatory upper thoracic deformity in Lenke 2A patients treated with Vertebral Body Tethering.	Boeyer, Hoernschemeyer	None
32.	TOPS	Multicenter clinical trial to assess the effects of diet and exercise on prevention of knee osteoarthritis in middle-aged women	Cook	NIH
33.	Testing Batteries for Pre-Osteochondral Allograft Surgery Optimization	Determine the impact of short versus standard length behavioral testing batteries on outcomes following OCA	Cook	TLRO
34.	Biomarkers for Human Hip Dysplasia	The purpose of this study is to evaluate the biomarkers present in individuals with hip dysplasia and/or secondary hip osteoarthritis and compare the levels to patients without hip dysplasia and/or secondary hip osteoarthritis.	Cook	DOS

#	Project Title	Description	PI	Sponsor
35.	Barriers to Clubfoot Treatment	The aim of this study is to provide a better understanding for why patients and their families do not adhere to the prescribed treatment of wearing braces.	Gupta, Royse	
36.	Patients' Perceptions of Success after VBT and Spinal Fusion	Explore and compare patients' subjective perceptions of success and satisfaction three or more years after anterior vertebral body tethering or posterior spinal fusion.	Hoernschemeyer, Royse	Zimmer
37.	Machine Learning for OA	Using machine learning methods to better understand mechanisms and progression of osteoarthritis.	Leary	DOS
38.	COVID-19 STAReD	to deploy the sensor system in the homes of rural community-dwelling older adults with disabilities and evaluate the effect of the sensor system on reducing disability and improving health-related quality of life.	Proffitt	NIH
39.	PARTNORS	The patient advisor team works directly with researchers to collaboratively design research questions for comparative effectiveness of biologic vs. artificial surgical treatment options for complex knee problems.	Royse	PCORI
40.	Qualitative Study Exploring Definitions and Experiences of Adherence in Orthopaedics	Determine a broader understanding of adherence through the lens of the healthcare team, with the goal of creating a model of patient adherence.	Rucinski	Gordon Fellowship
41.	Mixed Methods for PTOA	Characterize PTOA development to develop a risk classification tool for early-onset PTOA.	Stannard, Leary, Royse	DOS
42.	TOPS biomarker study	a prospective longitudinal analysis of serum and urine biomarkers for characterization of knee OA disease progression, delineation of response to preventative intervention, and determination of functional outcomes	Stoker, Leary	DOS
43.	Characterization of biological effect of intra-articular injections for knee OA	Evaluate synovial fluid, serum, and urine biomarker concentration and patient-reported outcomes in knee OA patients following PRP or corticosteroid injection	Sullentrup	TLRO
44.	PCORnet GPC Phase 3	Provide overall network leadership for the Greater Plains Collaborative (GPC) PCORNet Clinical Data Research Network (CRN) consisting of thirteen research medical centers. This includes developing the governance, regulatory processes, technical infrastructure, and patient engagement strategies to enable a learning health care system by integrating Comparative Effectiveness Research with clinical workflows.	Waitman; Royse is Patient Engagement Officer	PCORI
45.	Mental healthcare in BioJoint Patients	How the addition of a behavioral health psychologist to the OCA care team impacts functional patient outcomes	Williams	TLRO

#	Project Title	Description	PI	Sponsor
46.	Biomarkers for Intervertebral Disc Degeneration	The overall goal of our research is to comprehensively characterize pathology of the degenerative disc disease and to optimize diagnosis, treatment, and clinical outcomes.	Choma	DOS
47.	Anterior Short-Segment Fusion Outcomes	The purpose of this project is to gather clinical and radiographic data to gain important clinical insight on the long-term outcomes of patients who underwent anterior short segment instrumented fusion for AIS.	Choma	DOS
48.	Intraoperative Epidural Steroid Administration Following Discectomy	The aim of this study is to develop a grading scale for intraoperative assessment of nerve root inflammation to determine if this subjective assessment is an adequate indicator for response to epidural steroids following discectomy.	Moore	DOS
49.	Hip Resilience	This study is designed to be a prospective, longitudinal registry that will measure patient resilience using the validated CD-RISC 10 questionnaire, along with patient reported outcome (PRO) measures collected at preoperative and postoperative intervals.	Defroda	DOS
50.	RTS	To electronically capture and integrate patient functional measures from PT to clinical utilization without patient handling	Leary	DOS
51.	ACL Injury In Vitro	Scientific research on ACL injury and healing through laboratory analysis of tissue.	Ma	DOS
52.	CartiHeal RCT for Focal Cartilage Defects in the Knee	Randomized clinical trial to compare clinical outcomes for Agili-C vs. surgical standard of care (SSOC) for treatment of focal cartilage defects in the knee.	Ma	CartiHeal
53.	CALYPSO	A pivotal study to evaluate the safety and effectiveness of the Calypso Knee System when used in subjects with symptomatic osteoarthritis of the medial compartment of the knee.	Ma	Moximed
54.	NOVOCART® 3D	The purpose of this clinical study is to demonstrate the superior efficacy of the NOVOCART® 3D autologous chondrocyte transplantation system compared to Microfracture in the treatment of articular cartilage defects of the knee in patients who have had inadequate response to conservative treatment.	Ma	Aesculap Biologics, LLC
55.	ACL Resilience	This study is designed to be a prospective, longitudinal registry that will measure patient resilience using the validated CD-RISC 10 questionnaire, along with patient reported outcome (PRO) measures collected at preoperative and postoperative intervals.	Nuelle, Clay	DOS
56.	Synovial Fluid Analysis Following ACL Injury	To analyze synovial fluid from the knee after ACL injury and at the time of ACL reconstruction or repair surgery, to characterize the nature of the joint environment with respect to inflammatory and degradative processes in order to determine optimal timing of surgery.	Stannard	DOS

#	Project Title	Description	PI	Sponsor
57.	The STaR Trial	The purpose of this study is to investigate the effects of timing of surgery (early vs. delayed) and timing of post-op rehabilitation (early vs. delayed) for the treatment patients that have sustained a Multi-Ligament Knee Injury	Stannard	Department of Defense
58.	SEC PCL	The goals of this study are to determine a population-based incidence of isolated PCL injury and isolated MCL injury and how these injuries compare to all ligament injuries, compare the performance of and occurrence of secondary meniscal tears with PCL injury to patients without PCL injury, and evaluate ability of patients with isolated PCL or MCL injury to remain active in collegiate football.	Stannard	DOS
59.	In Vitro Measures of Hip Pathologies	The overall goal of our research is to comprehensively characterize pathology of hip osteoarthritis and to optimize diagnosis, treatment, and clinical outcomes of orthopaedic diseases.	Crist	DOS
60.	Irrisept Trauma	The purpose of this study is to determine the effects of Irrisept and antibiotic nails on lowering deep infection rates in type III open tibia fractures.	Crist	Irrimax Corporation
61.	AO Fragility Fractures	The aim of this registry is to investigate the outcome of nonsurgical (conservative) and surgical treatment for FFPs in the elderly, and thereby to specify the indication of operative intervention.	Della Rocca	AO
62.	AO Prospective Registry for Periprosthetic Fractures	The purpose of this prospective, international, multicenter, observational registry is to gain insight into the osteosynthesis treatment of PPFx, the associated complications, and functional and patient reported outcome after PPFx of hip or knee arthroplasties.	Della Rocca	AO
63.	Pilon NAC	The primary objective is to measure cartilage cell viability utilizing a technique that is frequently performed at our institution examining the number and density of living cartilage cells from a given sample at the time the final surgery is performed.	Schweser	Research Council Grant
64.	Syndesmosis Ankle Study	The purpose of this study is to compare early weight-bearing vs. delayed weight-bearing following a suture button surgical repair of a syndesmosis injury.	Schweser	DOS
65.	Diabetic Ankle Fractures	This study aims to provide initial clinical data towards this goal by examining the utility of using a post-operative protocol to allow for immediate weight bearing in this patient population.	Schweser	AOFAS
66.	Talus Replacement Registry	To determine if custom 3D printed talar body replacements, either used alone or with total ankle replacements, will maintain physiologic motion, have no difference in complications when compared to hindfoot fusions with allograft, lead to good outcome scores and patient satisfaction scores.	Schweser	DOS

#	Project Title	Description	PI	Sponsor
67.	Gut Microbiome and Postoperative Fracture Recovery	The purpose of this study is to determine if the overall gut biome has an impact on post-operative complications.	Schweser	DOS
68.	Skin Preparation for Elective Foot and Ankle Surgery	The primary objective is to compare the rate of surgical site infection and wound complications following skin preparation for surgery by using the standard of care skin cleaning (with chlorhexidine/iodine solution) versus standard of care complemented by skin cleaning with isopropyl alcohol and scrubbing with chlorhexidine soap.	Schweser	DOS
69.	ASES Shoulder PJI Multicenter Database study	The purpose of this study is to prospectively collect pertinent data from patients undergoing revision shoulder arthroplasty at our institution and contribute to establishing a multicenter database.	Kim	DOS
70.	Impact of Video Exposure on Cadaveric Surgical Outcomes	The goal is to determine the educational utility of optimized surgical videos.	London	American Foundation for Surgery of the Hand
71.	ROM-PROM	The aim of this study is to determine the impact of hand, wrist, and forearm range of motion on patient-reported outcomes after a non-hand injury, such as a wrist fracture.	London	Research Council Grant
72.	Cerner Distal Radius Fx	To utilize Cerner Real World Data	London, Leary	DOS
73.	RANGER	The primary objective of this registry study is to collect utilization, safety, and functional recovery outcomes data on nerve injuries repaired with the Avance® Nerve Graft.	Nuelle	Axogen Corp
74.	Blood Flow Restriction & Tennis Elbow Rehab	Our objective is to provide evidence-based applied research aimed at improving treatment options and optimizing rehabilitation strategies for lateral epicondylitis by incorporating blood flow restricted training.	Nuelle (J)	DOS
75.	Tornier Shoulder Replacement Outcomes Study (SHOUT)	The purpose of this study is to collect immediate, medium and long-term data on the related clinical complications and functional outcomes of market-approved Tornier shoulder products to demonstrate safety and performance of our implants in a real-world setting.	Smith	Tornier, Inc.
76.	Punch vs. Drill and Post-operative Pain	The purpose of this study is to determine if different techniques used in the creation of suture anchor socket creation can influence post-op pain following rotator cuff repair.	Smith	DOS
77.	Pyrocarbon Clinical Follow-up Study	The objective of this multi-center study is to collect medium and long-term data on the related clinical complications and functional outcomes of the Pyrocarbon Humeral Head to demonstrate safety and performance, in subjects from the Pyrocarbon IDE Study cohort.	Smith	Tornier, Inc

#	Project Title	Description	PI	Sponsor
78.	Tempo of Maturation	Identify the timing and tempo of skeletal maturation in juvenile and adolescent idiopathic scoliosis patients and how that relates to key milestones associated with the Adolescent Growth Spurt. Semi-longitudinal data will be collected from multiple pediatric spine programs around the United States.	Boeyer	None
79.	Arthrex Fusion with Staples	The primary objective for the proposed study is to document initial clinical outcomes for use of nitinol staples for first metatarsal-phalangeal joint (MTP1J) fusion with respect to degree of fusion and maintenance of correction.	Summerhays	Arthrex, Inc.
80.	Limb Optimization Registry	This registry is being established to follow patients of the Limb Optimization Center in The Department of Orthopaedic Surgery	Crist	DOS

## TRANSLATIONAL STUDIES

#	Project Title	Description	PI	Sponsor
1.	BioJoint ACL - Viable ACL Allografts	ACL reconstruction in dogs using MOPS-ACL preserved ACL allografts.	Cook	BioJoint Innovation
2.	Cell Cycle-Mediated Optimization of Cartilage	Assessment of tissue engineered articular cartilage for joint restoration in a canine model.	Cook (MU), Hung (CU)	NIH NIAMS
3.	FAI Modeling	Assessment of hip stability, ROM, and contact area and pressure effects of normal, dysplastic, and FAI canine and human hips using robotic testing.	Crist	BioJoint Innovation
4.	AANA ALR Recon	In vitro and biomechanical assessments of common graft types used for acetabular labrum repair	DeFroda	AANA
5.	OREF ALR Recon	In vitro, biomechanical, and in vivo (canine model) assessments of common graft types used for acetabular labrum repair	DeFroda	OREF
6.	TRIUMPH Hip	Assess functional outcomes for femoral head OCA and labral MAT in comparison to THA	Crist	MU TRIUMPH
7.	OCD and Skeletal Maturity	Examines OCD lesions in pediatric patients aged 7 to 18 to determine relationship of healing with skeletal maturity.	Duren, Brimmo	DOS
8.	Dexamethasone in Engineered Cartilage	In vitro and canine model study evaluating Dexamethasone delivery for articular cartilage regeneration using tissue engineered constructs.	Cook (MU), Hung (CU)	NIH NIAMS
9.	Critical Periods of Fracture Risk in Childhood	Identifying timing and signs of transient fracture risk in growing children.	Duren	NIH
10.	The Value of Skeletal Maturity in Orthopaedics	Research to maximize the utility of skeletal maturity assessment in pediatric orthopaedic practice.	Duren	DOS & SRS
11.	Updating Skeletal Maturity Methods	Updating and improving methods for determining skeletal maturity from the hand-wrist.	Duren	NIH

#	Project Title	Description	PI	Sponsor
12.	Stay Strong Stay Healthy Study	Measures body composition and balance across an 8 week intervention.	Duren	MU Extension
13.	Spine Growth and Maturation	Creating models of segmental spine growth based on skeletal maturation and designing growth charts and interactive tools for predicting spine growth	Duren	(NIH pending)
14.	3D limb alignment	Comparison of EOS vs traditional alignment study	Duren, Kfuri	DOS
15.	Heads and Hands	The use of skeletal age to better model biological changes in the craniofacial complex.	Duren, Sherwood	Triumph
16.	Peds ACL	Assess the relationship between injury risk and skeletal growth and/or maturation in adolescents with torn Anterior Cruciate Ligaments.	Ma, Boeyer	UNCG
17.	Determining Sex-Related Differences in ACL Healing after BTB Reconstruction	Compare outcomes after patellar BTB autograft ACL reconstruction in male vs female dogs in a validated model.	Ma	BioJoint Innovation
18.	Bacteriophage Treatment	Compare local bacteriophage infusion to SOC for infected nonunion fractures	Schweser	OTA
19.	MOPS-N with PEGf	Evaluate MOPS-N in vitro and in a canine sciatic nerve gap reconstruction model for fresh (viable) peripheral nerve allograft transplantation	J Nuelle	MTF

## BASIC SCIENCE STUDIES

#	Project Title	Description	PI	Sponsor
1.	Sex-Related Differences in Biomarker Production in the Osteoarthritic Knee	Determine sex related differences in the regional production of biomarkers by OA cartilage tissue from patients undergoing OCA and TKA surgeries to assess the role of sex in OA development and progression and identify novel biomarkers and targets for treatment for OA.	Stoker	TLRO
2.	Comparison of Normal Canine IPFP and Human OA IPFP Metabolism	Determine how chondrocytes respond to stimulation with biomarkers released from IPFP obtained from OA patients.	Stoker	TLRO
3.	Correlation of Biomarker Production by OA IPFP	Determine patient related variability in biomarker production by the OA IPFP and identify factors potentially associated with these changes.	Stoker	TLRO
4.	Comparison of Normal Canine IPFP and Human OA IPFP Metabolism	Determine changes in biomarker production by the IPFP associated with meniscal allograft transplantation.	Stoker	TLRO

#	Project Title	Description	PI	Sponsor
5.	Assessment of Biomarkers in Biojoint Patients	Utilizing serum, urine and synovial fluid to evaluate biomarkers.	Stoker	TLRO
6.	Characterizing OA Phenotypes Based on Chondrocyte Metabolism	Develop novel patient cohorts based on the in vitro metabolism of the chondrocytes obtained after OCA or TKA surgery.	Stoker	TLRO
7.	Correlating OA Chondrocyte Metabolism to Patient Demographics	Determine how OA chondrocyte metabolism relates to patient demographics.	Stoker	TLRO
8.	Comparing OA and Normal Chondrocyte Biomarker Production	Determine how OA effects the metabolism of chondrocytes during initial in vitro culture.	Stoker	TLRO
9.	Mapping of the OA Knee, Bone Biomechanical Properties	Determine how the biomechanical properties of the bone change in response to development of OA and in relation to primary lesion and histological changes.	Stoker	TLRO
10.	Mapping of the OA Knee, Cartilage Tissues Biomechanical Properties	Determine how the biomechanical properties of the cartilage change in response to development of OA and in relation to primary lesion and histological changes.	Stoker	TLRO
11.	Metabolic Mapping of the Osteoarthritic Knee Based on Responses to Compressive Load	Determine differences in the regional production of various biomarkers in response to compressive load by OA cartilage tissue from patients undergoing OCA and TKA surgeries.	Stoker	TLRO
12.	Metabolic Mapping of Subchondral Bone in OA	Determine differences in the regional production of various biomarkers by the underlying bone collected from undergoing OCA and TKA surgeries to identify novel biomarkers and targets for treatment for OA.	Stoker	TLRO
13.	Develop Novel Tissue Testing Strategies for Cartilage and Subchondral Bone	Develop novel testing methodologies to determine if these novel assessments better relate to tissue metabolism in subsequent studies.	Stoker	TLRO
14.	Biomechanical Mechanisms for Metabolic Responses to Impact Injury and Compressive Loading in OA Cartilage	Determine how biomechanical and histological changes in the OA cartilage tissue correlates to the tissues response to compressive load and impact injury.	Stoker	TLRO
15.	Evaluation of Patient demographics effects on Chondrocyte metabolism during in vitro culture	Determine how patient demographics effect the metabolism of OA chondrocytes during in vitro culture.	Stoker	BioJoint Innovation
16.	Residency Scoring	To standardize and automate scoring procedures using an electronic database to improve efficiency and accuracy for residency applications	Leary, Gupta	DOS
17.	Early Diagnosis of Hip Dysplasia using Serum and Urine Protein Biomarkers	Determine the ability of serum and urine biomarkers to predict CHD in dogs prior to radiographic diagnosis of hip dysplasia in a canine population.	Bozynski/Crist	TLRO\OFA
18.	Metabolic Mapping of Biomarkers for Cartilage Lesion Severity	Determine differences in the regional production of various biomarkers by OA cartilage tissue from patients undergoing OCA and	Stoker	BioJoint Innovation

#	Project Title	Description	PI	Sponsor
		TKA surgeries to identify potential differences in disease progression between these two patient populations and identify novel biomarkers and targets for treatment for OA.		
19.	Effects of Cell Culture Split Ratio on Chondrocyte Metabolism	Determine split ratio effects the metabolism of normal canine chondrocytes during in vitro culture.	Stoker	BioJoint Innovation
20.	Effects of Storage Time on OCA Chondrocyte Metabolism	Determine if storage time of the OCA graft effects the metabolism of the chondrocytes harvested from the tissue during in vitro culture.	Stoker	BioJoint Innovation
21.	Metabolic Mapping of the OA Meniscus	Determine the regional production of various biomarkers by normal meniscal tissue to determine how the metabolism changes after meniscal injury and during meniscal degradation.	Stoker	BioJoint Innovation
22.	Correlation of Biomarkers to Basic Science Measures of Knee OA	Determine how biomechanical and histological changes in the OA cartilage tissue correlates to changes in tissue metabolism.	Stoker	BioJoint Innovation
23.	Evaluation of MOPS for Preservation of Elbow OCAs	Determine the effectiveness of the MOPS protocol to store IVD OCA tissues for clinical use.	Stoker, Della Rocca	BioJoint Innovation
24.	Biomarkers for Diagnosis and Disease Staging in OA	Identify serum and urine biomarkers for the diagnosis and disease staging of OA.	Stoker, Sayers, Leary	TLRO
25.	Tibial Microstructure and Bariatric Surgery	Measures of bone/muscle/fat (including uCT and histomorphometry) in Bariatric Surgery patients and controls.	Duren	MU Research Council
26.	Cortical Bone Project	Modeling changes in bone size and density from birth to adulthood.	Duren	NIH
27.	Skeletal Morphology in Youth Baseball	Assessment of skeletal maturity and other bone morphology in youth sports.	Duren	External
28.	PANDA Study	Assisting ImageBiopsy on their automated skeletal maturity application (PANDA)	Duren	ImageBiopsy
29.	Spine Anatomy in ShapeUp!Kids	Self-supervised Machine Learning approach for derivation of spine lengths from DXA using ShapeUp! Kids	Duren	(NIH pending)
30.	Genomics of Bone and Body Composition Traits in Children	This study aims to identify genes that regulate development of bone density, quality, and strength in childhood.	Duren (MU)	NIH
31.	Growth Plate Properties	Examines anatomy, histology, and material properties of the porcine growth plate across several ages.	Guess, Duren	
32.	Biomechanical Tethers	Determine if cost-benefit of a single tether construct versus a double tether construct and its impact on tether breakage, construct stiffness, etc.	Hoernschemeyer, Boeyer	None
33.	FDA extension for Gait	theoretical extension of methods for more appropriate and comprehensive comparisons for the entire gait cycle	Leary	DOS
34.	Machine Learning for TKA	Using machine learning methods to better understand antecedents of patient satisfaction post-op.	Leary	DOS
35.	Best Statistical Practices in Orthopaedics Research	Best statistical practices in orthopaedics research.	Leary	DOS

#	Project Title	Description	PI	Sponsor
36.	NHANES-OA	Comparison of prediction models to answer the question: do computationally intensive analytical techniques actually produce better predictions than statistically appropriate prediction models which incorporate the survey design?	Leary	DOS
37.	DXA2 update	update DXA2	Leary	DOS
38.	QALY Evaluations in Orthopaedics	QALY measures in lower extremity (knee, ankle, hip). Knee considers UKA, TKA, Scope and OCA.	Leary, Cook	Richard Wallace
39.	Machine Learning in Cardiovascular -Omics	Compilation of a data repository from EMR and clinical testing data to test algorithm for longitudinal monitoring of patients with cardiovascular disease.	Leary, Emter	DOS/CVM/Fulbright
40.	Cadaveric biomechanical testing, digital reconstruction	Create a digital model of a knee undergoing OCA surgery to determine the biomechanical impact of different surgical techniques	Williams	TLRO
41.	Development and Validation of a Canine Tail IVD Model	Develop a novel canine caudal tail IVD model for the study of IVD degeneration, identification of novel biomarkers and targets for treatment.	Stoker	TLRO
42.	Effects of Injury on Intervertebral Disc Responses to Inflammation	Determine how injury effects the IVD tissues response to IL-6 and IL-18 stimulation using the rat tail IVD in vitro model.	Stoker	TLRO
43.	Effects of Insulin Level on Intervertebral Disc Responses to Injury and Inflammation	Determine how insulin level effects the IVD tissues response to IL-6 and IL-18 stimulation using the rat tail IVD in vitro model.	Stoker	TLRO
44.	Effects of Loading on IVD Degeneration in a Canine Tail Model	Determine how load frequency effects the metabolism of IVDs using the canine tail IVD ex vivo model.	Stoker	TLRO
45.	Effects of Repetitive Compressive Load on Injured Intervertebral Discs	Utilize the rat tail IVD model to determine the role of injury and loading on IVD degeneration.	Stoker	TLRO
46.	Comparison of Canine Lumbar and Caudal tissue metabolism for in vitro modeling	Determining if Canine Caudal tail tissue has similar responses to stimulus in vitro as Canine Lumbar IVD tissues for in vitro modeling purposes	Stoker	TLRO, DOS
47.	Mechanical Testing of Rat and Dog Tail IVDs	Develop mechanical testing protocols to assess changes in tissue biomechanical properties after various stimuli.	Stoker, Choma	TLRO
48.	Biomarkers for Cervical vs Lumbar Disc Degeneration	Determine differences in biomarker production by degenerate cervical and lumbar tissues to identify novel biomarkers and targets for treatment for IVD degeneration.	Stoker, Choma	TLRO, DOS
49.	Disease Mechanisms for Cervical vs Lumbar Disc Degeneration	Determine differences in cytokine stimulated biomarker production by degenerate cervical and lumbar tissues to identify novel biomarkers and targets for treatment for IVD degeneration.	Stoker, Choma	TLRO, DOS

#	Project Title	Description	PI	Sponsor
50.	In Vitro Model of Cervical Disc Degeneration	Determine differences in basal and cytokine stimulated biomarker production by degenerate cervical tissues to identify novel biomarkers and targets for treatment for IVD degeneration.	Stoker, Choma	TLRO, DOS
51.	In Vitro Model of Lumbar Disc Degeneration	Determine differences in basal and cytokine stimulated biomarker production by degenerate lumbar tissues to identify novel biomarkers and targets for treatment for IVD degeneration.	Stoker, Choma	TLRO, DOS
52.	In Vitro Model of Lumbosacral Disc Degeneration	Determine differences in basal and cytokine stimulated biomarker production by degenerate lumbosacral tissues to identify novel biomarkers and targets for treatment for IVD degeneration.	Stoker, Choma	TLRO, DOS
53.	Acute Responses of Intervertebral Discs to Injury and Inflammation	Determine the initial response of whole organ IVDs to stimulation with IL-1b and TNF-a to identify potential roles of these cytokines in IVD degeneration using the whole organ Rat Tail IVD model.	Stoker, Choma	TLRO, DOS
54.	Prolonged Responses of Intervertebral Discs to Injury and Inflammation	Determine the initial response of whole organ IVDs to stimulation with IL-1b to identify potential roles of chronic exposure to this cytokines in IVD degeneration using the whole organ Rat Tail IVD model.	Stoker, Choma	TLRO, DOS
55.	Metabolic Responses of Degenerative Cervical and Lumbar Intervertebral Discs to Cytokine Stimulation	Determine the metabolic response of degenerate cervical and lumbar IVD tissues to inflammation.	Stoker, Choma	TLRO, DOS
56.	Comparison of automated knee radiograph assessment tool and physician grading of OA patient radiographs	Determine the efficacy of automated knee scoring system	Stoker, Keeney, C Cook	TLRO, DOS
57.	Early Cellular Responses to Mechanical Strain by Tissues Involved in ACL Repair	Determine how tensile load effects the metabolism of cells from various tissue important for ACL repair.	Ma	TLRO, DOS
58.	Effect of Time from Surgery on the Metabolism of the Remnant ACL and Synovial Tissue at the Time of ACL Reconstruction Surgery	Determine how time from injury effects the metabolism of the torn ACL and synovium, may indicate how ACL metabolism changes after injury and if needs to be removed during ACL Reconstruction	Stoker	TLRO
59.	Evaluation of Synovial Fluid, Serum, and Urine Biomarker Changes after ACL Reconstruction	Identify potential biomarkers for the assessment of ACL effectiveness and ligamentization of the tendon graft	Stoker	TLRO
60.	Evaluation of the Effect of Estrogen Metabolic Response of Patellar Tendon Tissues to cytokine stimulation	Determine how hormone levels may contribute to sex differences in reconstruction failures	Stoker	TLRO

#	Project Title	Description	PI	Sponsor
61.	Metabolic Responses of Ligament and Tendon to Pro-Inflammatory Stimulation	Identify differences in biomarker production by ACL, SYN, and autograft tissues to cytokine stimulation ex vivo.	Stoker	TLRO
62.	Comparison of Metabolism of ACL Remnants, Synovium, and Common ACL Autografts	Identify differences in biomarker production by ACL, SYN, and autograft tissues at the time of ACL reconstruction surgery.	Stoker, Ma	TLRO, DOS
63.	Biomarkers for ACL Rupture	Identify differences in biomarker production by ACL and SYN tissues at the time of ACL reconstruction surgery.	Stoker, Ma	TLRO, DOS
64.	Metabolic Characterization of Common Autografts used for ACL Reconstruction	Identify differences in biomarker production by ACL, SYN, and autograft tissues at the time of ACL reconstruction surgery.	Stoker, Ma	TLRO, DOS
65.	NITRO	develop novel techniques for the regeneration and reconstruction of intra-articular (IA) cartilage and subchondral (SC) bone, the two key tissue types in a joint, in osteoarthritis (OA) patients.	Cook, Jimi	ARPAH