SUMMARY TOTALS

Clinical: 57	Translational: 16	Basic Science: 68
AAU Studies: 7		
Grand Total: 141 Studies		

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.	ConforMIS TKA Prospective, Multicenter Outcomes Study	ConforMIS is studying whether patients receiving patient specific total knee implants result in higher patient satisfaction and improved function when compared to patients who receiving off-the-shelf total knee implants with patient specific instrumentation.	Cook, Keeney	ConforMIS Inc.
4.	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
5.	Total Joint Rehab Study	To assess the impact of postoperative rehabilitation and environment of care on patient reported outcome measures, patient perception of value of their rehabilitation program, and the relative value (cost/difference in patient reported outcome) of rehabilitation in the comparative rehabilitation environments.	Keeney	DOS
6.	PROMISES Negative Pressure Wound Therapy for Revision TKAs	The goal of this study is to evaluate surgical site complications (SSCs) in subjects undergoing a revision of a failed total knee arthroplasty (TKA) when closed incision negative pressure therapy (ciNPT) is used to manage the closed incision, as compared to standard of care dressing.	Keeney	KCI USA, Inc.
7.	Comparative Knee Replacement Outcome Study	The purpose of our study is to compare outcomes of patients who were treated with biological or mechanical knee replacements.	Keeney	DOS

#	Project Title	Description	PI	Sponsor
8.	Comparison of Radiographic Grading Systems for Severity of Knee Osteoarthritis	Develop and evaluate novel radiographic assessment tools for the diagnosis and staging of knee OA .	Stoker, Keeney, C Cook	TLRO
9.	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
10.	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
11.	MOPS Clinical Outcomes Study	2-year clinical outcomes study for patients receiving MOPS OCAs for knee.	Cook	MTF
12.	Mizzou BioJoint Lifelong Registry Study	Clinical outcomes registry for all BioJoint patients (knee, hip, ankle, shoulder).	Cook	DOS
13.	BioJoint Flex	Clinical outcomes study to assess knee range of motion gains using BioJoint Flex device vs standard of care.	Cook	Coulter
14.	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
15.	OAKCOAT	Looking at long-term outcomes for patients who have undergone OCA surgery in combination with osteotomy.	Leary, Cook	DOS/Dean's office
16.	Biomarkers in Orthopaedics	Clinical outcomes study that looks at biomarkers in blood, urine, and synovial fluid in patients with various MSK conditions.	Stannard	DOS
17.	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
18.	Biologic Joint Replacement - DOD	1-year clinical outcomes study for patients receiving bipolar OCA knee transplants.	Stannard, Cook	Department of Defense
19.	Biologic Joint Replacement - DOD Expansion	1-year clinical outcomes study for patients receiving bipolar OCA knee or ankle transplants.	Stannard, Cook	Department of Defense
20.	Comparison of Open vs Mini Surgical Repair for Achilles Tendon Ruptures	To compare 1 year subjective scores, functional outcomes, tendon morphology, and complications rates in a cohort of patients receiving mini-Achilles tendon repair technique to those receiving the standard open Achilles tendon repair.	Barber	DOS
21.	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

#	Project Title	Description	PI	Sponsor
22.	Braun Phase IV Peds Cefazolin Study	The primary objective of this study is to evaluate the safety of a single 30-minute infusion of a weight-based dose of cefazolin (1 g or 2 g) in pediatric subjects between 10 and 17 years of age (inclusive) scheduled for surgery.	Gupta, Sumit	Braun Medical Inc.
23.	Post-Operative Use of Opioid Analgesics in Pediatric Orthopaedic Patients	To assess the amount of opioid pain medications used by patients after undergoing pediatric orthopaedic surgery and to determine which factors predict higher narcotic use in the post-operative period after pediatric orthopaedic surgery.	Gupta, Sumit	DOS
24.	A Multicenter, Multinational Clinical Assessment Study for Pediatric Patients with Achondroplasia	Multicenter, multinational study to collect serial growth measurements on pediatric patients with achondroplasia (ACH) being considered for subsequent enrollment in Study 111-201 or other BioMarin-sponsored studies.	Hoernschemeyer	BioMarin Pharmaceuticals Inc.
25.	Vertebral Body Tethering for Adolescent Scoliosis	To determine clinical outcomes, through radiographs and cobb angle measurements, of Vertebral Body Tethering (VBT) in patients with Adolescent Idiopathic Scoliosis (AIS) 2 years post-operatively.	Hoernschemeyer	DOS
26.	BioMarin Achondroplasia Treatment Study 1	To assess BMN111 as a therapeutic option (growth plate expansion and skeletal growth) for the treatment of children with achondroplasia (ACH).	Hoernschemeyer	BioMarin Pharmaceuticals Inc.
27.	Magnetic Resonance Imaging (MRI) Evaluation of Adolescent Idiopathic Scoliosis (AIS) Patients Who Have Undergone Vertebral Body Tethering (VBT)	To determine the effect of Vertebral Body Tethering (VBT) on the spine anatomy (using MRI Imaging).	Hoernschemeyer	Scoliosis Research Society American Academic of Ortho Surgeons
28.	Power and Balance Recovery in Rehab	Explore whether high-speed power training improves balance recovery during a forward fall compared with traditional slow-speed RT in older adults.	Guess, Sayers	PT
29.	MCID in Ortho PROs	Minimum clinically important differences in ortho PROs.	Leary	DOS
30.	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
31.	Balance in Adult Spinal Deformity	The purpose of this research is to study the effect of spinal deformity on overall balance and vestibulospinal compensation and compare this particular population and their associated characteristics to age-matched controls to provide objective evidence of balance deficiencies that can be attributable to spinal deformity in a prospective format.	Goldstein	DOS

#	Project Title	Description	PI	Sponsor
32.	Reduced Blood Flow for Rehab after ACL Reconstruction	To determine if there is a difference in muscle strength, thigh circumference, knee range of motion, VAS, IKDC, Tegner, PROMIS surveys, HGH, IGF, CK levels, KT2000, and Lachman's exam in those patients that participate in Delfi moderated blood flow postoperative ACL physical therapy vs. standard ACL post-operative physical therapy.	Cook	DOS
33.	UCLR Injury in MLB Athletes	Investigating associations of pre-injury performance metrics on return to MLB play following UCLR in a cohort of MLB pitchers.	Leary	DOS
34.	Motion Analysis to Screen for Student-Athlete Injury Risk	Determine the ability of DARI motion capture data to determine lower extremity non-contact injury risk in Mizzou student-athletes.	Leary, Cook, Stannard	DOS
35.	ACL Injury In Vitro	Scientific research on ACL injury and healing through laboratory analysis of tissue.	Ma	DOS
36.	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.	Sherman	CartiHeal
37.	J-Shift for Patellar Tracking	Researchers at Ohio State University (coordinating site) are studying how doctors grade the severity of the J-Shift, and how these grades match other measurements of the knee.	Sherman	DOS
38.	Justifying Patellar Instability Treatment by Early Results (JUPITER)	The purpose of this study is to determine how to best treat patients under the age of 25 who have dislocated their patella for the first time in order to reduce rates of recurrent instability.	Sherman	Hospital for Special Surgery/DOS
39.	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.	Sherman	Moximed
40.	Hyperosmolar Fluids for Arthroscopy	To determine if a hyperosmolar solution, similar to what is used in head trauma patients, can reduce the degree of fluid extravasation in knee arthroscopy, if it has an effect on post-operative knee pain or post-operative pain medication consumption compared to isotonic solution.	Stannard	DOS
41.	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
42.	Patient Outcomes After ORIF and Acute THA for Acetabular Fractures	The objective is to assess functional outcomes, patient satisfaction, secondary surgeries, and mortality rates in patients who under go a combined open reduction internal fixation and acute total hip arthroplasty after an acetabular fracture and compare this to historical data on the same outcomes in patients who undergo only an open reduction internal fixation of the same fracture.	Schweser	DOS

#	Project Title	Description	PI	Sponsor
43.	Mizzou Knee Arthrometer Testing System (MKATS)	The primary objective is to evaluate the repeatability, function, and applicability of the Mizzou Knee Arthrometer Testing System (MKATS).	Cook	MU Coulter Programs
44.	PRP for Pilon Fractures	Determine the effects of a single intra-articular injection of platelet rich plasma (PRP) for mitigating the development of post-traumatic arthritis (PTA) in patients being surgically treated for pilon fractures in one ankle and to assess the discriminatory potential of a synovial fluid biomarker panel for categorizing presence and severity of PTA based on patient-reported outcome measures of pain and function, as well as diagnostic imaging findings in patients being treated for pilon fractures in one ankle.	Crist	Orthopaedic Trauma Association
45.	Cerament-G RCT for Open Tibial Fracture Repair	Randomized clinical trial to evaluate the safety and effectiveness of CERAMENT™|G as a bone void filler/synthetic bone graft in conjunction with SOC orthopedic procedures for open diaphyseal tibial fractures.	Crist	BONESUPPORT AB
46.	AO IMPACT Multicenter Clinical Trial	To evaluate the construct validity of the performance metrics to assess surgeons' performance of cephalomedullary nailing procedures and to distinguish between novice and experienced (and proficient) surgeon performances, to define proficiency benchmarks for surgeons' performance of cephalomedullary nailing procedures, and to identify phases of the procedure and performance metrics which are very good discriminators between expert and novice performance.	Crist	AO Foundation
47.	Intranasal Calcitonin to Improve Pain and Activity in Elderly Pelvic Ring Injuries	The purpose of this study is to see if the hormone calcitonin is better at treating pain in elderly people with pelvic fractures than the routine treatment.	Crist	AOTrauma North America
48.	3D-Printing for Acetabular Fracture Repair Planning and Education	The purpose of the study is to evaluate the change in resident comprehension of acetabular fracture patterns with the use of 3D printed acetabular fracture models as teaching modules.	Schweser	DOS
49.	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
50.	NSAIDS for Reducing Opioids after Wrist Fractures	Randomized clinical trial to compare postoperative pain of skeletally mature patients with distal radius fractures administered NSAIDs for pain control versus those administered acetaminophen for pain control and to compare the need for narcotic pain medication for breakthrough pain in patients given NSAIDs for pain control as compared to patients given acetaminophen for pain control.	Bridgeman	DOS

#	Project Title	Description	PI	Sponsor
51.	Hand Stiffness after Injury	To determine the sensitivity and specificity of a unique set of clinical exam findings in predicting significant hand stiffness at 6 months after upper extremity trauma and to determine the effectiveness of early hand therapy intervention for patients with early signs of hand stiffness following upper extremity trauma.	Bridgeman	DOS
52.	Biomarkers for Shoulder OA	The overall goal of our research is to investigate and identify inflammatory pathways and pathologic substances present in diseased shoulder joints in order to optimize diagnosis, treatment, and clinical outcomes of osteoarthritic processes in non-weight-bearing joints.	Smith	DOS
53.	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.
54.	Superior Capsular Reconstruction (SCR) Clinical Trial	The purpose of this observational, feasibility study is to determine if patients with irreparable supraspinatus tears who receive Arthroflex to reconstruct the superior capsule during arthroscopic rotator cuff repairs have improved functional and clinical outcomes.	Smith	Arthrex, Inc.
55.	Pyrocarbon Total Shoulder Replacement System Clinical Trial	This study is being conducted in order to evaluate the safety and efficacy of the Aequalis Pyrocarbon Humeral Head. The data will then be used to support a Food and Drug Administration submission for clearance.	Smith	Wright Medical Group N.V
56.	Total Shoulder Arthroplasty Multi-Center Registry	The objective of the study is a multi-center prospective registry to collect clinical outcomes of anatomic and reverse total shoulder arthroplasty.	Smith	Arthrex, Inc.
57.	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

TRANSLATIONAL STUDIES

#	Project Title	Description	PI	Sponsor
1.	Flexible Osteochondral Allograft Study	Evaluate a method for bending and shaping OCAs for entire articular resurfacing in a canine model.	Cook	Department of Defense
2.	BioJoint ACL - Viable ACL Allografts	ACL reconstruction in dogs using MOPS-ACL preserved ACL allografts.	Cook	BioJoint Innovation

#	Project Title	Description	PI	Sponsor
3.	Bioactive Glue for Meniscal Healing	Assess a bioactive glue for avascular meniscal tear healing in a canine model.	Cook	NIH
4.	Critical Periods of Fracture Risk in Childhood	Identifying timing and signs of transient fracture risk in growing children.	Duren	NIH
5.	The Value of Skeletal Maturity in Orthopaedics	Research to maximize the utility of skeletal maturity assessment in pediatric orthopaedic practice.	Duren	DOS
6.	Updating Skeletal Maturity Methods	Updating and improving methods for determining skeletal maturity from the hand-wrist.	Duren	NIH
7.	Best Statistical Practices in Orthopaedics Research	Best statistical practices in orthopaedics research.	Leary	DOS
8.	OA Analytical Review - What do we Know?	Review of OA.	Leary	DOS
9.	QALY Evaluations in Orthopaedics	QALY measures in BioJoint (knee, ankle, hip).	Leary, Cook	Richard Wallace
10.	ELUTE Fiber for ACL Reconstruction Augmentation	Assess a growth factor eluting fiber for ACLR in a canine model.	Cook	TissueGen
11.	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
12.	Can Iron Chelators Augment the Re-vascularization and Osseointegration of Large Osteochondral Allografts for Traumatic Articular Reconstruction in a Canine Model? A Pilot Study.	A pilot study to determine whether iron chelators augment the revascularization and osseointegration of large osteochondal allografts for traumatic articular reconstruction in a canine model.	Drager, Crist, Cook	AO Trauma North America
13.	Bioabsorbable Shoulder Anchor Resorption Study	Longitudinal (10yr) MRI, CT and histologic assessment of bioabsorbably suture anchors in canine model.	Cook	Arthrex, Inc.
14.	Biomaterials for Partial Rotator Cuff Repair	Assessment of amnion, collagen patch, and dermal patch for partial RC tear repair in canine model.	Cook, Smith	Arthrex, Inc.
15.	Arthrex	Arthrex THA in dogs using novel system.	Cook	Arthrex, Inc.
16.	Cardiovascular Data Repository	Compilation of a data repository from EMR and clinical testing data to test algorithm for longitudinal monitoring of patients with cardiovascular disease.	Leary, Manring	DOS/Engineering/SOM

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 changes in biomarker production by the IPFP associated with OA development	Stoker	TLRO
3.	Correlation of biomarker production by OA IPFP	Determine how biomarker production by the OA IPFP is related	Stoker	TLRO
4.	Acute Responses of OA Cartilage to Impact Injury	Determine how the metabolism of OA cartilage tissue corresponds to the tissue's response to impact injury	Stoker	TLRO
5.	Effects of OA Cartilage Biomechanical Properties on Responses to Impact Injury and Compressive Loading	Determine how biomechanical and histological changes in the OA cartilage tissue effects the tissues response to compressive load and impact injury.	Stoker	TLRO
6.	A Novel Split-Tissue Model for Evaluating Treatments for OA	Utilize the split tissue OA cartilage tissue model to evaluate potential cytotoxic and metabolic effects of novel treatments on OA cartilage tissue.	Stoker	TLRO
7.	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
8.	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
9.	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
10.	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
11.	Metabolic Mapping of Inflammatory and Degradative Biomarkers in the Osteoarthritic Knee	Determine differences in the regional production of various biomarkers by OA cartilage tissue from patients undergoing OCA and TKA surgeries to identify novel biomarkers and targets for treatment for OA.	Stoker	TLRO

#	Project Title	Description	PI	Sponsor
12.	Metabolic Mapping of the Osteoarthritic Knee to Determine Important Patient Differences	Determine differences in the regional production of inflammatory biomarkers by OA cartilage tissue from patients undergoing OCA and TKA surgeries to assess the role of inflammation in OA development and progression and identify novel biomarkers and targets for treatment for OA.	Stoker	TLRO
13.	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
14.	Regional Variation in TIMP and Matrix Metalloprotease Production in the Osteoarthritic Knee	Determine differences in the regional production of degradative and anti-degradative biomarkers by OA cartilage tissue from patients undergoing OCA and TKA surgeries to assess the role of degradative enzymes in OA development and progression and identify novel biomarkers and targets for treatment for OA.	Stoker	TLRO
15.	Temporal Changes in Osteoarthritic Chondrocyte Metabolism	Determine how the metabolism of OA cartilage changes over time in culture to identify potential targets for treatment and biomarkers for diagnosis.	Stoker	TLRO
16.	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
17.	Comparison of normal and OA chondrocyte metabolism during in vitro culture	Determine differences in OA and normal chondrocyte metabolism to identify pathways potentially important in OA development and progression	Stoker	BioJoint Innovation
18.	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
19.	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	TLRO\OFA
20.	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 TKA surgeries to identify potential differences in disease progression between these two patient populations and identify novel biomarkers and targets for treatment for OA.	Stoker	BioJoint Innovation
21.	Correlation of Osteoarthritic Cartilage Lesion Severity to Metabolic Biomarkers for Disease Severity	Determine how the metabolism of OA cartilage correlates to gross and histological changes in cartilage associated with OA to determine how physical changes are associated with metabolic changes during OA.	Stoker	BioJoint Innovation

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22.	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
23.	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
24.	Evaluation of MOPS for Preservation of Ankle and Elbow OCAs	Determine the effectiveness of the MOPS protocol to store IVD OCA tissues for clinical use.	Stoker	BioJoint Innovation
25.	Metabolic Mapping of the Canine 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
26.	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
27.	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
28.	Tibial Microstructure and Bariatric Surgery	Measures of bone/muscle/fat (including uCT and histomorphometry) in Bariatric Surgery patients and controls.	Duren	DOS
29.	Cortical Bone Project	Modeling changes in bone size and density from birth to adulthood.	Duren	NIH
30.	Skeletal Morphology in Youth Baseball	Assessment of skeletal maturity and other bone morphology in youth sports.	Duren	DOS
31.	Beta Distribution in Clinical Research	Method to assess sample size and power for outcomes with a beta distribution for clinical trials (SAS code, R package development).	Leary	DOS
32.	Growth Modeling: Not All Models are Equal	Comparisons of growth modeling frameworks and outcomes.	Leary	DOS
33.	Extensions of the Bayesian Framework for the Geometric Morphometrics Toolkit	Extensions of the Bayesian framework for the geometric morphometrics toolkit.	Leary	DOS
34.	Applying the Geometric Morphometrics Toolkit for Growth Modeling	Applying the geometric morphometrics toolkit for growth modeling.	Leary	DOS
35.	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
36.	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
37.	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

#	Project Title	Description	PI	Sponsor
38.	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
39.	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
40.	Evaluation of the IVD response to injury and RANTES stimulation using the rat tail IVD ex vivo model	Determine the potential roles of RANTES in IVD degeneration	Stoker	TLRO
41.	Mechanisms of Intervertebral Disc Disease Related to Diabetes	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, Choma	TLRO, DOS
42.	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, Goldstein	TLRO, DOS
43.	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, Goldstein	TLRO, DOS
44.	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, Goldstein	TLRO, DOS
45.	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, Goldstein	TLRO, DOS
46.	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, Goldstein	TLRO, DOS
47.	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, Goldstein	TLRO, DOS
48.	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, Goldstein	TLRO, DOS

#	Project Title	Description	PI	Sponsor
49.	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, Goldstein	TLRO, DOS
50.	Mizzou Functional Assessment Screening Tool (MFAST) for ACL Injury Risk Assessment	Use inexpensive, portable technologies for sideline-based movement screening of youth athletes to identify injury risk factors and guide corrective exercises for the prevention of musculoskeletal sports injuries.	Guess, Gray	DOS
51.	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
52.	Biomarkers of ACL Healing in Response to Mechanical Strain	Determine how tensile load effects the metabolism of cells from various tissue important for ACL repair (human).	Ma	TLRO, DOS
53.	3D Hydrogels for Articular Cartilage Repair	Develop and test novel 3D printed hydrogels for treatment of focal cartilage defects.	Skelley	KCALSI
54.	Differences in Metabolic Responses for Lateral vs Medial Meniscus	Identify potential differences in the metabolic response of lateral and medial menisci to collagenase degeneration.	Stoker	TLRO
55.	Collagenase-Induced Metabolic Responses of Meniscus	Development and characterization of an in vitro meniscal degeneration model.	Stoker	TLRO
56.	Effect of time from surgery on the metabolism of the remnant ACL and Synovial tissue at the time of ALC 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
57.	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

#	Project Title	Description	PI	Sponsor
58.	Evaluation of the effect of estrogen metabolic response of ACL and PCL cells and tissues to various stimuli	Determine how hormone levels may contribute to sex differences in ACL injury and reconstruction failures	Stoker	TLRO
59.	Metabolic Responses of ACL and PCL to Pro-Inflammatory Cytokine Stimulation	Determine if there are differences in the metabolic response of ACL and PCL tissues to cytokine stimulation that may indicate potential reasons for differences in the tissues ability to heal after injury.	Stoker	TLRO
60.	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
61.	Metabolic Responses of Patellar, Biceps, and Achilles Tendons in a Collagenase-Induced Degenerative Tendinopathy Model	Determine and compare the metabolic response of tendon tissues to collagenase degradation to identify potential targets for treatment and biomarkers for diagnosis.	Stoker	TLRO
62.	PRP vs BMC for Tendon Healing	Comparison BMC v LP-PRP v LR-PRP for tendon healing using in vitro tendon degeneration model.	Stoker, Cook	TLRO
63.	Development and Characterization of an In Vitro Tendon Degeneration Model	Develop and validate a novel in vitro tendon degeneration model using collagenase insults to canine tendons.	Stoker, Cook	TLRO
64.	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
65.	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
66.	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
67.	Metabolic Mapping of Humeral Head Articular Cartilage	Determine the regional production of various biomarkers by normal cartilage tissue harvested from the canine humoral head.	Stoker, Smith	TLRO
68.	Metabolic Responses of Humeral Head Cartilage to Load	Determine the regional production of various biomarkers by normal cartilage tissue harvested from the canine humoral head in response to compressive load.	Stoker, Smith	TLRO