SUMMARY TOTALS

Clinical: 69	Translational: 21	Basic Science: 35
AAU Studies: 6		
Grand Total: Studies 125		

Clinical

#	Project Title	Description	PI	Sponsor
1.	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	Aggarwal	Stryker Orthopaedics
2.	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.	Ghanem	DOS
3.	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
4.	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
5.	Mizzou BioJoint Lifelong Registry Study	Clinical outcomes registry for all BioJoint patients (knee, hip, ankle, shoulder).	Cook	DOS
6.	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
7.	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 h	Crist	DOS
8.	Biomarkers in Orthopaedics	Clinical outcomes study that looks at biomarkers in blood, urine, and synovial fluid in patients with various MSK conditions.	Stannard	DOS
9.	BD Surgiphor	The purpose of this study is to determine whether sterile povidone-iodine solutions can decrease the occurrence of acute periprosthetic joint injections.	Ghanem	Ctr for Innovation & Research Organization

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10.	Oral vs IV	The aim of this study is to determine whether oral (PO) antibiotics are non-inferior to intravenous (IV) antibiotics for the treatment of periprosthetic joint infections (PJI), as determined by the proportion of patients experiencing treatment failure at	Ghanem	Ctr for Innovation & Research Organization
11.	AO PedORTHO Registry	A prospective multicenter observational registry of pediatric orthopedic trauma and health outcomes in skeletally immature children	Gupta	AO
12.	BMN-212	Study 111-212 is a Phase 2, randomized, double-blind, placebo-controlled, multicenter study to assess the safety and efficacy of vosoritide versus placebo in infant and young children HCH.	Hoernschemeyer	BioMarin Pharmaceuticals Inc.
13.	AttaCH	The purpose of this study is to find out if TransCon CNP, an investigational drug, is safe and effective in the treatment of children with achondroplasia.	Hoernschemeyer	Ascendis Pharma
14.	BMN 111-302	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.
15.	AttaCH	The purpose of this long-term open label extension (LT-OLE) trial will provide data on continued safety, tolerability, and sustained efficacy of navepegritide in children and adolescents who have completed a prior navepegritide trial.	Hoernschemeyer	Ascendis Pharma
16.	BMN 111-303	The purpose of this study is to evaluate the effect of 52 weeks of daily administration of vosoritide on AGV, standing height, and height Z-score in participants with HCH.	Hoernschemeyer	BioMarin Pharmaceuticals Inc.
17.	PROPEL	The purpose of this clinical study is to collect data and medical history from children born with Achondroplasia (ACH).	Hoernschemeyer	QED Pharma
18.	PROPEL 3	The purpose of this study is to assess the efficacy and safety of infigratinib compared to placebo for increasing AHV in subjects with ACH.	Hoernschemeyer	QED Pharma
19.	PROPEL OLE	The purpose of this study is to assess the efficacy and safety of infigratinib compared to placebo for increasing AHV in subjects with ACH.	Hoernschemeyer	QED Pharma
20.	ACCEL	This is a multicenter, multinational observational study to assess growth and the clinical course of HCH over time in children.	Hoernschemeyer	QED Pharma
21.	ACCEL 2/3	The purpose of this study is to assess the efficacy and safety of infigratinib in participants with HCH who have short stature.	Hoernschemeyer	QED Pharma
22.	Harms Study Group	Evaluate the efficacy of non-fusion surgical treatment of Spinal Deformity Correction in Idiopathic Scoliosis.	Hoernschemeyer	Harms Study Group

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23.	BMN 111-902	This is a multicenter, multinational observational study to assess growth and the clinical course of HCH over time in children.	Hoernschemeyer	BioMarin Pharmaceuticals Inc.
24.	BPAQ Activity Outcomes	Longitudinal tracking of preoperative and postoperative outcomes in adolescent idiopathic scoliosis patients treat 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.	TIGER PROTOCOL	Determine the influence of a TIGER Protocol (None vs. V1 vs. V2) on perioperative outcomes following Vertebral Body Tethering	Boeyer	None
29.	SRS Named Grant	There is evidence to suggests rapid skeletal growth may be the primary mechanism driving postoperative growth modulation after Vertebral Body Tethering. The accurate prediction of future growth is dependent on patient-specific skeletal phenotypes; however	Boeyer	SRS $49,904
30.	Harms Lenke 2As	Evaluate postoperative changes in the compensatory upper thoracic deformity in Lenke 2A patients treated with Vertebral Body Tethering.	Boeyer, Hoernschemeyer	None
31.	TOPS	Multicenter clinical trial to assess the effects of diet and exercise on prevention of knee osteoarthritis in middle-aged women	J Nuelle	NIH
32.	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
33.	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
34.	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.	Royse, Gupta	
35.	Healing Together	Examine the lived experience of informal caregivers who take care of patients after biologic knee surgery.	Royse	

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36.	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
37.	Knee Surgery DA	Evaluate the impact of a decision aid on decision quality, conflict, and preparedness among patients considering OCAT vs TKA and explore patients' and informal caregivers' experiences with the decision-making process.	Royse	
38.	Nonsurg vs TKA	To prospectively compare the impacts of patients' decisions to pursue TKA versus nonsurgical management at the time of surgical consultation on satisfaction, physical function, pain, and mental health outcomes. To examine the lived experiences of informal	Royse, Cook	
39.	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
40.	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
41.	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 infrastru	McClay; Royse is Patient Engagement Officer	PCORI
42.	Mental healthcare in BioJoint Patients	How the addition of a behavioral health psychologist to the OCA care team impacts functional patient outcomes	Williams	TLRO
43.	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
44.	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
45.	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

#	Project Title	Description	PI	Sponsor
46.	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
47.	ACL Injury In Vitro	Scientific research on ACL injury and healing through laboratory analysis of tissue.	Ma	DOS
48.	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 ina	Ma	Aesculap Biologics, LLC
49.	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
50.	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 timi	Stannard	DOS
51.	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 in	Stannard	DOS
52.	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
53.	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
54.	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 arthropla	Della Rocca	AO
55.	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

#	Project Title	Description	PI	Sponsor
56.	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
57.	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
58.	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 sco	Schweser	DOS
59.	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
60.	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	Schweser	DOS
61.	CMC Arthroplasty	To assess outcomes with in-clinic occupational therapy (OT) and without in-clinic occupational therapy, using only the home exercise program (HEP) after trapeziectomy and suture suspensionplasty surgery procedures	J Nuelle	Arthrex, Inc.
62.	NTx24301	Evaluate the safety and efficacy NTX-001 compared to standard of care (neurorrhaphy) in the treatment in the Treatment of Upper Extremity Transected Nerves Requiring Surgical Repair	J Nuelle	Neurap
63.	INHANCE IDE	The purpose of this research study is to assess the safety and effectiveness of the INHANCE Reverse Stemless total shoulder in primary reverse stemless total shoulder arthroplasty	Kenter	Depuy Synthes
64.	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
65.	FASTR-TEN	The purpose of the study is to determine if brief electrical stimulation of your injured nerve after repair leads to improved muscle and nerve function postoperatively.	London	Checkpoint Surgical Inc.
66.	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	Smith	Tornier, Inc
67.	RESTORE	The purpose of the Fracture Prevention Program is to evaluate methods for caring for patients after a recent bone break or fracture.	Cook	PCORI

#	Project Title	Description	PI	Sponsor
68.	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.
69.	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

#	Project Title	Description	PI	Sponsor
1.	BioJoint ACL - Viable ACL Allografts	ACL reconstruction in dogs using MOPS-ACL preserved ACL allografts.	Cook	MOIC
2.	AANA ALR Recon	In vitro and biomechanical assessments of common graft types used for acetabular labrum repair	DeFroda	AANA
3.	OREF ALR Recon	In vitro, biomechanical, and in vivo (canine model) assessments of common graft types used for acetabular labrum repair	DeFroda	OREF
4.	SITES Osteointegration 3	Assess osteointegration of augemented trabecular metal implants	Cook	SITES Medical
5.	CRISPR for OA	Evaluate CRISPR for treatment of OA	Cook	OrthoBio
6.	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
7.	3D limb alignment	Comparison of EOS vs traditional alignment study	Duren, Kfuri	DOS
8.	Heads and Hands	The use of skeletal age to better model biological changes in the craniofacial complex.	Duren, Sherwood	Triumph
9.	Heads and Hands	The use of skeletal age to better model biological changes in the craniofacial complex.	Duren, Sherwood	NIH Pending
10.	Peds ACL	Assess the relationship between injury risk and skeletal growth and/or maturation in adolescents with torn Anterior Cruciate Ligaments.	Ma, Boeyer	UNCG
11.	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
12.	BPAQ Activity Outcomes	Longitudinal tracking of preoperative and postoperative outcomes in adolescent idiopathic scoliosis patients treat with Vertebral Body Tethering	Boeyer	None
13.	VBT R01	Over 16,0000 children in the US are hospitalized for treatments of their spinal deformities. The current surgical standard of care for these	Mel Boeyer	NIH

		conditions is an instrumented posterior spinal fusion. These procedures are expensive (>$100,000) and as they "fus		
14.	MAT for ALR MTF	Evaluate fresh MAT for ALR in a preclinical and clinical study	Crist	MTF
15.	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 pediat	Boeyer	None
16.	SCIDRP	There is evidence to suggests rapid skeletal growth may be the primary mechanism driving postoperative growth modulation after Vertebral Body Tethering. The accurate prediction of future growth is dependent on patient-specific skeletal phenotypes; however	Boeyer	SCIDRP $99,997
17.	APEX-EAP	The objective is to provide access to the VT-X7 KIT for subjects with PJI of the hip or knee undergoing exchange arthroplasty who lack therapeutic alternatives. VT-X7 KIT is a drug-device combination product consisting of 2 antibiotics, vancomycin hydroch	Ghanem	APEX-EAP
18.	APEX-LTF	This is a multi-site, retrospective chart review study with potential limited subject contact. The purpose of the study is to evaluate long-term outcomes following treatment for periprosthetic joint infection (PJI) using the VT-X7 system under IND 132585.	Ghanem	APEX-LTF
19.	PIVOT-LC1	To asses feasibility of the proposed trial and to collect information to inform the design of the definitive trial.	Crist	USC
20.	BLADE	The objective of this open label trial is to assess the safety, tolerability and between-group effect size of STIMULAN VG (with debridement and a course of systemic antibiotics) compared to standard care (debridement and systemic antibiotics only) in pati	Crist	Biocomposites
21.	Continuous Activity	It remains unclear the consequences of non-operative management of stress positive lateral compression pelvic ring fractures, which patients benefit most from surgery, what surgery to perform, and how much benefit is received. There is a lack of prospecti	Crist	AO

Basic Science

#	Project Title	Description	PI	Sponsor
1.	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/Stoker	TLRO\OFA
2.	Determine the role of exosome signaling in OA	Determining how exosomes from the SYN and IPFP effects cartilage tissue	Stoker	TLRO
3.	Determine metabolic response of OA cartilage to Oa IPFP	Determine how chondrocytes respond to stimulation with biomarkers released from IPFP obtained from OA patients.	Stoker	TLRO
4.	Determine metabolic response of OA joint tissue to various stimulations	Building on results of the IPFP co-culture study, cartilage and IPFP will be stimulated with specific protein biomarkers associated with changes in tissue metabolism in previous study	Stoker	TLRO
5.	Determine relationship between IPFP pathobiology and PROMS after TKA surgery	Determine if changes in IPFP pathobiology is associated with PROMs after TKA	Stoker	TLRO
6.	Determine relationship between synovial pathobiology and PROMS after TKA surgery	Determine if changes in SYN pathobiology is associated with PROMs after TKA	Stoker	TLRO
7.	Determine how changes in cart tissue biomech properties effects the metabolic responses of the tissue to load	Determine biological factors that contribute to OA progression and identify biomarker indicative of changes in the cartilage tissues response to load towards the de3velopment of novel protein biomarker panels to diagnose and predict OA	Stoker	TLRO
8.	how OA and joint instability changes ACL and PCL biology	Uses recovered tissues from OA animal models performed for other studies to determine how the biology of the ACL and PCL changes during OA development and progression	Stoker	TLRO
9.	Determine how pro-and anti-inflammatory stimulation effects the metabolic response of the SYN and IPFP tissues	Uses recovered tissues from OA animal models performed for other studies to determine metabolic responses of the ACL and PCL tissues to metabolic stimulation	Stoker	TLRO
10.	Determine the differential effect of isolated exosomes based on culture conditions on cartilage and other joint tissues	Determine the differential effect of isolated exosomes from ACL and PCL based on culture conditions on cartilage and other joint tissues	Stoker	TLRO
11.	how OA changes IPFP and syn biology	Uses recovered tissues from OA animal models performed for other studies to determine how the biology of the IPFP and STN changes during OA development and progression	Stoker	TLRO
12.	Determine how pro-and anti-inflammatory stimulation effects the metabolic response of the SYN and IPFP tissues	Uses recovered tissues from OA animal models performed for other studies to determine metabolic responses of the IPFP and SYN tissues to metabolic stimulation	Stoker	TLRO

#	Project Title	Description	PI	Sponsor
13.	Determine the differential effect of isolated exosomes based on culture conditions on cartilage and other joint tissues	Determine the differential effect of isolated exosomes based on culture conditions on cartilage and other joint tissues	Stoker	TLRO
14.	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	ARPAH
15.	Tibial Microstructure and Bariatric Surgery	Measures of bone/muscle/fat (including uCT and histomorphometry) in Bariatric Surgery patients and controls.	Duren	MU Research Council
16.	Cortical Bone Project	Modeling changes in bone size and density from birth to adulthood.	Duren	NIH
17.	Skeletal Morphology in Youth Baseball	Assessment of skeletal maturity and other bone morphology in youth sports.	Duren	External
18.	Spine Anatomy in ShapeUp!Kids	Self-supervised Machine Learning approach for derivation of spine lengths from DXA using ShapeUp! Kids	Duren	(NIH pending)
19.	Growth Plate Properties	Examines anatomy, histology, and material properties of the porcine growth plate across several ages.	Duren	
20.	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
21.	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
22.	Determine if the pathobiology of the IVD tissue relates to PROMs after surgery	Determine if patient outcomes after IVD surgery is associated with differences in IVD tissue pathobiology	Stoker	TLRO
23.	Determine how patient glucose status effects pathobiology of IVD tissues	Determine how diabetes and patients glucose status contributes to IVD pathobiology, development, and progression	Stoker	TLRO
24.	Determine effect of smoking on pathobiology of IVDD	Determine effect of smoking on pathobiology of IVDD	Stoker	TLRO
25.	Determine how IVDD biology differs between cervical and lumbar regions in asymptomatic patients	Determine how IVDD biology differs between cervical and lumbar regions in asymptomatic patients	Stoker	TLRO
26.	Determine how IVDD pathobiology differs between cervical and lumbar regions in symptomatic patients	Determine how IVDD pathobiology differs between cervical and lumbar regions in symptomatic patients	Stoker	TLRO
27.	Determine how BMI effects IVD tissue biology in symptomatic and asymptomatic patient populations	Determine how BMI effects IVD tissue biology in symptomatic and asymptomatic patient populations	Stoker	TLRO

#	Project Title	Description	PI	Sponsor
28.	Determine how grade of IVDD effects the tissue protein content in the symptomatic and asymptomatic patient populations	Determine and compare how grade of IVDD effects the tissue protein content in the symptomatic and asymptomatic patient populations	Stoker	TLRO
29.	Determine if there is a relationship between IVD tissue pathobiology and development of adjacent disc disease in patients after surgery	Determine if there is a relationship between IVD tissue pathobiology and development of adjacent disc disease in patients after surgery	Stoker	TLRO
30.	Determine how patient demographics at the time of ACLR relates to different in joint tissue metabolism	Determine how patient demographics at the time of ACLR relates to different in joint tissue metabolism	Stoker	TLRO
31.	Determine if there is a relationship between tissues recovered during ACLR and PROMS after surgery	Determine if there is a relationship between tissues recovered during ACLR and PROMS after surgery	Stoker	TLRO
32.	Determine how concurrent injuries effects joint tissues after injury	Determine how concurrent injuries effects joint tissues after injury	Stoker	TLRO
33.	Determine how the ACL and SYN of the ACL injured knee effects autograft tissue	Determine how the ACL and SYN of the ACL injured knee effects autograft tissue	Stoker	TLRO
34.	Determine how time from injury to surgery affects the ACL and SYN pathobiology	Determine if there is an optimal window for ACLR surgery after injury based on ACL and SYN inflammation and degradative enzyme production	Stoker	TLRO
35.	Develop novel Luminex assays using commercial components	Develop novel Luminex assays to reduce the cost per sample for these assays, create broader panels that encompass study specific biomarkers to reduce the number of assays required to perform, and reduce the amount of sample required for testing	Stoker	TLRO