

# Title

**Development of a new IMAC Sorbent for Phosphopeptide Enrichment for Monitoring the Diagnosis, Course, and Treatment of Osteoarthritis and Implementing the Omic Mapping of Synovial Fluid in Proteomic, Metabolomic and Lipidomic Studies**

**Project# TÜBİTAK-SBAG 223S509**

# Design

## **Multi-Disciplinary & Translational**

### **Disciplines**

Basic Sciences  
Chemistry-Physical Chemistry  
Engineering  
Chemical Engineering  
Bioengineering  
Pharmacy  
Analytic Chemistry  
Medicine  
Sports Medicine  
Histology & Embryology  
Biostatistics  
Hacettepe University Central Laboratories (HÜNİTEK)  
Medicine and Cosmetics Research Center (HÜNİKAL)

**Cross-sectional non-interventional clinical study.**

### **Patients (Swelling in the Knee Joint-Synovial fluid removal)**

- Osteoarthritis
  - Primary
  - Secondary
- Traumatic (Sports)

**(Ethical Board Approval-Hacettepe University Date: 19/12/2023 # SBA 23/262)**

### **Independent Variable**

Groups

### **Dependent Variables**

IMAC Particle Synthesis  
Control  
SiO<sub>2</sub>  
SiO<sub>2</sub>@PEI  
SiO<sub>2</sub>@PEI@Ti(IV)  
Omic Studies  
Proteomics (MALDI-TOF LC/MS)  
Metabolomics (Q-TOF LC/MS)  
Lipidomics (Q-TOF LC/MS)  
ELISA Studies  
COL2, HA, COMP & MMP3