

Curriculum Vitæ

Dr. Pranav Kumar Mishra

Post-Doctoral Research Fellow
Department of Surgery and Orthopedic Surgery
Rush University

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Education

2020	MBBS , Kasturba Medical College, Manipal, India
2013	BA in Biology , Washington University in St. Louis, USA
2009	EMT-B , College of DuPage, USA

Professional Appointments

2021 – Present	Post-Doctoral Research Fellow Laboratory of Anna Spagnoli, Department of Orthopedic Surgery Laboratory of Alfonso Torquati, Department of Surgery Laboratory of Susan Chubinskaya, Department of Pediatric Surgery (2021-2022) Rush University, USA
2021 – 2021	Junior Resident - Non-Academic Department of Surgical Oncology Kasturba Medical College, Manipal Manipal Academy of Higher Education, India

Awards and Honors

2022	1st Place - Elevator Speech Finalists' Competition - Rush Judges Award. Exploring novel hormones in the Bone-Fat-Insulin metabolism interface. Presented at the 2022 Rush University Trainee Research Day
2022	3rd Place - Elevator Speech Finalists' Competition - Rush People's Choice Award. Exploring novel hormones in the Bone-Fat-Insulin metabolism interface. Presented at the 2022 Rush University Trainee Research Day

2020	3rd Place Oral Presentation – AAPI A deductive approach to modeling the spread of COVID-19. Presented at American Association of Physicians of Indian Origins Virtual Summit 2020
2013 – 2018	First Class Honors at Kasturba Medical College, Manipal Medicine (with Psychiatry), Surgery (with Orthopedics), Pediatrics, Pathology, Microbiology, Pharmacology, Physiology, and Biochemistry
2016	1st Place Oral Presentation - AFMC Invasive Rhabdomyosarcoma of the Nasopharynx and Cranium in a 21-year-old male. Presented at Illuminati, Armed Forces Medical College, Pune, India.

Fellowships

2021 – Present	Rush Public Voices Fellowship Full scholarship for the 40-member Rush cohort to the Op-Ed Project. The program provides instruction and mentorship towards publishing op-ed articles with the media
2009 – 2009	Summer Undergraduate Research Fellowship PI: Igor Efimov, Department of Biomedical Engineering, Washington University in St. Louis Funding: Howard Hughes Medical Institute and Imaging Sciences Pathways training grant Amount: \$ 3750

Postgraduate Training

Research

2009 – 2013	Project 1: Determine the mechanisms regulating the bone-fat-glucose interface PI: Anna Spagnoli, MD (Orthopedic Surgery); Alfonso Torquati, MD, MSCI (Surgery). Understand the role of sclerostin to metabolic, endocrine, and musculoskeletal health through a comparison between obese and non-obese individuals. Creation of a biorepository and experimentation with gastrointestinal, adipose, and blood samples from Roux-en-Y gastric bypass patients and non-obese cadavers. Clinical research coordination: recruitment and monitoring of patients in the study. Clinical and research database creation and maintenance
2021 – Present	Project 2: Role of IL-36RA in osteoarthritis and post-traumatic osteoarthritis PI: Anna Spagnoli, MD (Orthopedic Surgery); Susan Chubinskaya, PhD (Pediatrics). Determine the role of IL-36RA in mitigating factors of osteoarthritis (OA) and post-traumatic osteoarthritis (PTOA). Examining the augmentation of molecular and histological characteristics of impacted articular cartilage with IL-36RA. Impaction-Bioreactor-Indentation tribology experimental model for mitigating mechanical stress on traumatically damaged cartilage with IL-36RA

2021 – 2022

Project 3: Human cartilage tissue repository

PI: Susan Chubinskaya, PhD (Pediatrics) Intake and processing donated human cadaver specimens into the tissue repository.

Dissection of en-bloc human legs for knee and ankle joints experiments, including articular cartilage, synovium, and synovial fluid.

Grading degenerative morphological changes (DMC) to human articular cartilage.

Multivariate and machine-learning models for clinical factors leading to DMC.

National collaborations with tissue repository specimens.

Clinical

2021

Junior Resident (Non-Academic) – Surgical Oncology – KMC, Manipal

Appointment with Dr. Naveen Kumar, Head of Department, Surgical Oncology.

Intra-operative: first or second assist in open cases. Second assist in lap / VATS. 9 major surgeries per week.

In-patient pre-operative and post-operative management with 15 patients on service.

Medical Experience

MBBS Internship

Role comparable to a US PGY-1 Transitional Year. Following the Final MBBS examinations, Indian doctors complete a “compulsory rotating internship”. Intern/house doctor in 11 departments, across primary, secondary, and tertiary care settings, treating patients speaking English, Hindi, and Kannada. Primary location: Kasturba Medical College, Manipal, KA, India

6 weeks

General Surgery

Kasturba Medical College, Manipal: Direct responsibility for 10 in-patients on service, ER call, out-patient clinic services.

Intra-operative: first or second assist in open and laparoscopic general surgical cases.

Jackson Park Hospital, Chicago, IL (Abroad rotation, 4 weeks)

4 weeks

Orthopedic Surgery

In-patient management on the spine service, directly responsible for 5-7 patients, trauma call, out-patient evaluation and follow-up.

Second assistant in spine cases. First assist in trauma. Supervised with traction pinning.

6 weeks

Emergency Medicine (2 weeks mandated + 4 weeks additional elective)

Kasturba Medical College, Manipal: Level 1 trauma center. Lead physician for yellow and green zone. Assisted attendings with blue-zone critical, trauma, and ED-ICU patients.

Jackson Park Hospital, Chicago, IL (Abroad rotation, additional 4 weeks)

8 weeks	<p>Community Medicine (Preventative and Social Medicine)</p> <p>Preventative and social medicine: community surveillance of HIV, leprosy, tuberculosis, complications from diabetes.</p> <p>Dr. TMA Pai Rotary Hospital, Karkala, KA (Remote rural secondary care hospital): in-patient, out-patient, and emergency department duty for pediatric, OB/Gyn, and adult emergent patients.</p> <p>Rural Primary Healthcare Centers (PHC) in Udupi District, KA: out-patient clinic, managing 5-10 adult patients per day in the capacity of a family medicine physician.</p>
8 weeks	<p>Obstetrics and Gynecology</p> <p>In-patient/out-patient management of 5-15 patients directly in services, including high-risk pregnancy, fetal medicine, oncology. Intra-op first or second assistant.</p> <p>Labor Theater: conducted / assisted deliveries, monitored/augmented progress of labor.</p> <p>Manipal Artificial Reproductive Centre: evaluated for causes of infertility, assisted in management via ovulation induction, IUI, IVF.</p>
10 weeks	<p>Internal Medicine (6 weeks mandated + 4 weeks additional research)</p> <p>In-patient management of 5-10 patients in ICU, step-down tele, and ward patients. Consult services and ER call duties.</p> <p>Out-patient adult clinic and university student clinic.</p> <p>COVID-19 research during non-clinical lockdown rotation.</p>
4 weeks	<p>Psychiatry</p> <p>Streamwood Behavioral Healthcare System, Streamwood, IL, USA (Abroad rotation):</p> <p>In-patient child psychiatry, assisting attending with 15-20 acute patients.</p> <p>Coordinated pharmacology, behavioral, family, and DCFS care.</p>
4 weeks	<p>Pediatrics</p> <p>In-patient management of 15-20 patients directly. PICU and Peds ER call duty.</p> <p>Out-patient evaluation, medication review, and vaccination.</p>
2 weeks	<p>Ear, Nose, Throat – Head and Neck Surgery</p> <p>In-patient and intra-operative management for 5 patients, assisting residents.</p> <p>Outpatient clinic including diagnostic procedures EUM, VDL, audiometry.</p>
2 weeks	<p>Ophthalmology</p> <p>In-patient and intra-operative management for 5 patients, assisting residents.</p> <p>Outpatient clinic, including assisting diagnostic and therapeutic procedures.</p>
2 weeks	<p>Anesthesiology</p> <p>Assisting residents and attendings with intra-operative management.</p> <p>Critical care work for ventilator dependent ICU patients.</p>

Washington University Emergency Support Team (EST)

2009 – 2013	<p>Volunteer Emergency Medical Technician – Basic (EMT)</p> <p>EST responds to all EMS calls directed to the Washington University emergency dispatch center as the primary BLS team and provides large event stand-by coverage.</p> <p>2800+ hours of experience, with 2100+ hours as a senior EMT.</p>
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- 2013 **Field Director (Chief Medic)**
Responsible for the oversight of 57 EMTs, selection, training, quality assurance.
Coordinated with Medical Director (Alan Glass, MD) and Clayton Fire Department.
- 2011 – 2012 **Assistant Field Director of New Medics**
Conducted internal training of first years
Coordinated with St. Louis Community College for EMT-B certification.
Created “The Move-Up Guide” e-book containing 28 Standard Operating Protocols, 75 practical scenario questions, training advice, and mock call preparation.
- 2011 – 2012 **Disaster Committee Co-Head**
Planned and executed annual mass-casualty disaster drills.
Led meetings with university administration, police, and fire departments.
- 2010 – 2011 **Public Relations Committee**
Improved awareness of common on-campus illnesses, when/how to call EST.
Arranged First Aid/CPR classes for the St. Louis region.
- 2010 – 2012 **Webmaster**
Helped develop and maintain est.wustl.edu using Drupal on an AMP stack.

US Clinical Experience

- Aug 2022 **Emergency Medicine Elective**
Jackson Park Hospital and Medical Center; Chicago, IL, USA
- Jul 2022 **General Surgery Elective**
Jackson Park Hospital and Medical Center; Chicago, IL, USA
- Feb-Mar 2022 **Child Psychiatry - In-patient**
Streamwood Behavioral Healthcare System; Streamwood, IL, USA
- Jan 2017 **Neurosurgery Sub-Internship**
Pritzker School of Medicine, University of Chicago; Chicago, IL, USA

Publications

Pre-print

1. **Mishra PK** and Mishra S. 2020. COVID-19 Dashboard @ 

Oral Presentations

1. Esposito A, Wilson BM, Kluppel M **Mishra PK**, et al. 2022. CXCR4: A Key Axis in Mediating IGF-1 Signaling in Fracture Repair. Oral Presentation. ORS ISFR 3-Minute Research Pitch Competition

2. **Mishra PK**, Katrien C, Wilson BM, et al. 2022. Exploring novel hormones in the Bone-Fat-Insulin metabolism interface. Elevator Speech Finalists' Competition. Poster Presentation. 2022 Rush University Trainee Research Day. Chicago, IL
3. Esposito A, Wilson BM, Kluppel M **Mishra PK**, et al. 2022. Critical Role of IGF1/CXCR4 Signaling in Regulating HIF1 α and HIF2 α Expression in Fracture Repair. Podium presentation at Spotlight Session. Orthopedic Research Society 2022 Annual Meeting. Tampa, Florida. URL: <https://www.ors.org/Transactions/68/243.pdf>
4. **Mishra PK** and Mishra S. 2020. A deductive approach to modeling the spread of COVID-19. Oral Presentation. Presented at American Association of Physicians of Indian Origins Virtual Summit 2020. Chicago, IL



Poster Presentations

1. Corbeels K, Wilson BM, Meka SRK **Mishra PK**, et al. 2022. Bariatric surgery: a critical crossroad in the bone/glucose metabolism interface. Poster Presentation. ASBMR 2022 Annual Meeting. Austin, TX
2. Esposito A, Kluppel M, Meka SRK **Mishra PK**, et al. 2022. Critical Role of IGF1/CXCR4/VEGF α Axis in Fracture Repair. Poster Presentation. ORS ISFR 17th International Biennial Meeting. Edinburgh, UK
3. Esposito A, Kluppel M, Meka SRK **Mishra PK**, et al. 2022. Critical Role of IGF1/CXCR4/VEGF α Axis in Fracture Repair. Poster Presentation. ASBMR 2022 Annual Meeting. Austin, TX
4. Esposito A, Wilson BM, Kluppel M **Mishra PK**, et al. 2021. Critical Role of IGF1/CXCR4/VEGF α Axis in Fracture Repair. Poster Presentation. RUSH Symposium. Chicago, IL
5. Suryadevara V, Meka SRK, Kluppel M **Mishra PK**, et al. 2021. HGC-curcumin nanoparticles for therapeutic intervention of osteoarthritis as seen by their regulation of chondrocyte biology. Poster Presentation. RUSH Symposium. Chicago, IL
6. **Mishra P**, Lang D, and Efimov I. 2010. Induction of ventricular fibrillation: the compensatory role of proline-rich tyrosine kinase 2 in hypertrophic mice hearts. Poster Presentation. Fall Undergraduate Research Symposium. St. Louis. URL: <https://rgdoi.net/10.13140/RG.2.2.29649.81764>



Software

1. **Mishra PK** and Mishra S. 2020. COVID-19 Dashboard



Teaching Experience

St. Louis Community College - Forest Park

2010 – 2013 **Adjunct Instructor - EMT-Basic Course**
 Taught practical skills including ventilation, bleeding control, c-spine immobilization, extrication, cardiac arrest management, splinting.
 Evaluated students in trauma/medical mock calls, per NREMT and Missouri standards.

Patents and Trademarks

Trademarks (India)

4979064 Balakrishnan P, **Mishra, PK**. PREPAREDx. 2021;(Class 42).
 4979063 Balakrishnan P, **Mishra, PK**. PREPAREDx. 2021;(Class 9).

Licensures and Certifications

Licenses

2020 – Present **Registered Medical Practitioner**, Karnataka, India
 2018 – 2020 **Provisional Registration Certificate** - Karnataka, India
 2009 – 2013 **EMT-Basic License** - Illinois and Missouri

Certifications

2021 – 2024 **Biomedical Research** - CITI Program
 2020 – 2022 **Advanced Cardiac Life Support** - American Heart Association
 2020 – 2022 **Basic Life Support** - American Heart Association
 2018 – Present **Basic Neonatal Resuscitation Program** - Indian Academy of Pediatrics
 2009 – 2012 **EMT-Basic** - National Registry of Emergency Medical Technicians

External Funding Sources

2021 – 2022 **DNA damage and cellular senescence in osteoarthritis pathophysiology**
 NIH: R01 AG044034/AG/NIA
 PI: Richard F Loeser, Department of Medicine, University of North Carolina, Chapel Hill
 Sub-contract: Susan Chubinskaya, Department of Pediatric Surgery, Rush University
 Role: Pranav Mishra, human tissue procurement, morphological assessment, and processing

2009 – 2009

Summer Undergraduate Research Fellowship








PI: Igor Efimov, Department of Biomedical Engineering, Washington University in St. Louis

Funding: Howard Hughes Medical Institute and Imaging Sciences Pathways training grant

Amount: \$ 3750

Glossary

These are the meanings of the symbols used throughout this document:

-  Indicates that a publication is open-access
-  Link to a code repository on GitHub
-  Link to an open-access PDF, usually a preprint or postprint
-  Link to a video on YouTube
-  Link to a data archive
-  Link to presentation slides
-  Link to a poster