**Curriculum Vitae**

**Pranav Kumar Mishra, MBBS**

**Post-Doctoral Research Fellow**

Department of Orthopedic Surgery and Pediatrics

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# Biographical

Date of Birth: January 2, 1990  
Place of Birth: St. Charles, IL, USA

Citizenship: United States of America

# Education

**Kasturba Medical College, Manipal; Manipal Academy of Higher Education; Manipal, KA, India**

* M.B.B.S. (2020), Final MBBS with First Class Honors

**Washington University in St. Louis; St. Louis, MO, USA**

* B.A. Biology (2013)

**College of DuPage; Glen Ellyn, IL, USA**

* Emergency Medical Technician – Basic Certification (2009)

# Postgraduate Training and Fellowship

**Post-Doctoral Research Fellowship – Rush University; Chicago, IL, USA (2021-Present)**

Laboratory appointments

1. Anna Spagnoli, MD – Professor of Orthopedic Surgery and Pediatrics, Director of Molecular Medicine
2. Susan Chubinskaya, PhD – Vice Provost and Professor of Pediatrics, Orthopedic Surgery, and Medicine (Section of Rheumatology)

*Project 1: Determine the mechanisms regulating the bone-fat-glucose interface (Human arm)*

* 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

*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

*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

**Junior Resident (Non-Academic) – Surgical Oncology – KMC, Manipal (2021)**

* 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

# Honors and Awards

**Rush Public Voices Fellowship** **(2021-present)**

* 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

**3rd Place Oral Presentation – AAPI (2020)**

* *A deductive approach to modeling the spread of COVID-19*. Presented at American Association of Physicians of Indian Origins Virtual Summit 2020

**First Class Honors at Kasturba Medical College, Manipal (2013-2018)**

* Medicine (with Psychiatry), Surgery (with Orthopedics), Pediatrics, Pathology, Microbiology, Pharmacology, Physiology, and Biochemistry

**1st Place Oral Presentation - AFMC** (2016)

* *Invasive Rhabdomyosarcoma of the Nasopharynx and Cranium in a 21-year-old male*. Presented at Illuminati, Armed Forces Medical College, Pune, India.

**Washington University Summer Undergraduate Research Fellowship** (2010)

* Dr. Igor Efimov Lab, Department of Biomedical Engineering
* Research focus: roll of proline-rich tyrosine kinase 2 in ventricular fibrillation

# Professional Experience

**PREPAREDx (2021-Present)**

Online and mHealth software-as-a-solution platform

Co-founder and Chief Technology Officer

* Developed an end-to-end communication and workflow solution that improves emergency care outcomes
* Cellular-based, cost-effective, encrypted, and self-hosted communication system between ambulance services, emergency departments, and consult services
* Coordinating pilot study at Kasturba Medical College, Manipal (India)

**MBBS Internship (2018-2020)**

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

General Surgery (6 weeks)

* *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)*

Orthopedic Surgery (4 weeks)

* 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. Lead in traction pinning

Emergency Medicine (2 weeks mandated + 4 weeks additional)

* *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)*

Community (Family) Medicine (8 weeks)

* *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
* *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.
* Preventative and social medicine: community surveillance of HIV, leprosy, tuberculosis, complications from diabetes

Obstetrics and Gynecology (8 weeks)

* 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
* *Labor Theater*: conducted / assisted deliveries, monitored/augmented progress of labor
* *Manipal Artificial Reproductive Centre­*: evaluated for causes of infertility, assisted in management via ovulation induction, IUI, IVF

Internal Medicine (6 weeks mandated + 4 weeks additional research)

* In-patient management of ~5-10 patients in ICU, step-down tele, and ward patients. Consult services and ER call duties. Out-patient adult clinic and university student clinic
* COVID-19 research during non-clinical lockdown

Psychiatry (4 weeks)

* *Streamwood Behavioral Healthcare System, Streamwood, IL, USA (Abroad rotation):* In-patient child psychiatry, assisting attending with ~15-20 acute patients
* Coordinated pharmacology, behavioral, family, and DCFS care

Pediatrics (4 weeks)

* In-patient management of ~15-20 patients directly. PICU and Peds ER call duty.
* Out-patient evaluation, medication review, and vaccination

Ear, Nose, Throat – Head and Neck Surgery (2 weeks)

* In-patient and intra-operative management for ~ 5 patients, assisting residents
* Outpatient clinic including diagnostic procedures EUM, VDL, audiometry

Ophthalmology (2 weeks)

* In-patient and intra-operative management for ~5 patients, assisting residents
* Outpatient clinic, including assisting diagnostic and therapeutic procedures

Anesthesia (2 weeks)

* Assisting residents and attendings with intra-operative management
* Critical care work for ventilator dependent ICU patients

**Washington University Emergency Support Team (EST)** **(2009-2013)**

6515 Wydown Boulevard, Campus Box 3838, St. Louis, MO 63105

Volunteer Emergency Medical Technician – Basic (EMT)

* 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
* 2800+ hours of experience, with 2100+ hours as a senior EMT

Field Director (Chief Medic) (2013)

* Responsible for the oversight of 57 EMTs, selection, training, quality assurance
* Coordinated with Medical Director (Alan Glass, MD) and Clayton Fire Department

Assistant Field Director of New Medics (2011-2012)

* 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

Disaster Committee Co-Head (2011-2012)

* Planned and executed annual mass-casualty disaster drills
* Led meetings with university administration, police, and fire departments

Public Relations Committee (2010-2011)

* Improved awareness of common on-campus illnesses, when/how to call EST
* Arranged First Aid/CPR classes for the St. Louis region

Webmaster (2010-2012)

* Helped develop and maintain est.wustl.edu using Drupal on an AMP stack

**St. Louis Community College - Forest Park, St. Louis, MO, USA (2010-2013)**

5600 Oakland Ave, St. Louis, MO 63110

Adjunct Instructor for 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

# US Clinical Experience

**Emergency Medicine (Aug 2020)**

Jackson Park Hospital and Medical Center; Chicago, IL, USA

**General Surgery – In-patient** **(July 2020)**

Jackson Park Hospital and Medical Center; Chicago, IL, USA

**Child Psychiatry – In-patient (Feb – March 2020)**

Streamwood Behavioral Healthcare System; Streamwood, IL, USA

**Neurosurgery Sub-Internship (Jan 2017)**

Pritzker School of Medicine, University of Chicago; Chicago, IL, USA

# Licensures and Certifications

Biomedical Research - CITI Program (2021-2024)

Registered Medical Practitioner – Karnataka, India (2020 – present)

Advanced Cardiac Life Support – American Heart Association (2020-2022)

Basic Life Support – American Heart Association (2020-2022)

Basic Neonatal Resuscitation Program – Indian Academy of Pediatrics (2018-present)

Provisional Registration Certificate – Karnataka, India (2018-2020)

EMT-Basic – Illinois and Missouri (2009-2013)

National Registry of Emergency Medical Technicians (2009-2012)

# Research Experience

**Ongoing Projects**

Current projects at Rush University are described in detail in the aforementioned section “Postgraduate Training and Fellowship Appointments”

**Dr. Anna Spagnoli, Rush University; Chicago, IL, USA**

Department of Orthopedic Surgery

Project 1: Determine the mechanisms regulating the bone-fat-glucose interface

* With Dr. Alfonso Torquati (Surgery)

Project 2: Role of IL-36RA in osteoarthritis and post-traumatic osteoarthritis

* With Dr. Susan Chubinskaya (Pediatrics) and Dr. Markus Wimmer (Orthopedics)

**Dr. Susan Chubinskaya, Rush University; Chicago, IL, USA**

Department of Pediatrics

Project 1: Human cartilage tissue repository

**Dr. Jayaraj MB, Kasturba Medical College, Manipal; Manipal, KA, India**

Department of Emergency Medicine

* Impact of mHealth pre-hospital communication in improving decision making in the Emergency Department
* Pilot testing my personally developed software, PREPAREDx, as an end-to-end communication and workflow solution that improves emergency care outcomes

**Past Projects**

**Dr. Chandrakanth Are, University of Nebraska, Omaha, NE, USA**

Department of Surgery

* Analyzing the impact of geopolitical events on non-US citizen internationally trained physicians in the NRMP match
* Cross-correlation studies of international medical graduate placement with overall US immigration data

**Dr. Shekhar Mishra, Science Diplomacy and Innovation Management, Naperville, IL, USA**

* Deductive, observational modeling of COVID-19s initial exponential expansion through Phase 1 developed nations
* Forecasting COVID-19s spread through Phase 2 major emerging nations

**Dr. Suma Nair, Kasturba Medical College, Manipal; Manipal, KA, India**

Department of Community Medicine

* Rural community survey analyzing impacts of economic and social determinants of health in the Udupi region.
* Assessing empathy in medical students using the Jefferson Scale of Empathy Student Version. Data collection and statistical analysis

**Dr. Igor Efimov Lab, Washington University in St. Louis; St. Louis, MO, USA**

Department of Biomedical Engineering

*Undergraduate Researcher (2010):* Effects of PYK2 protein in Ventricular Fibrillation

* Simultaneous optical mapping of voltage and calcium channels of mice, rabbit, and human hearts, paced into ventricular fibrillation
* Skills acquired: optical mapping, western blot, immunohistochemistry, MATLAB

**Dr. Gerald Jackson, Hbar Technologies, LLC; West Chicago, IL, USA**

*Research Assistant (2006, 2007)*

* 3D modeling and simulation for an antimatter-sail propelled satellite (2006)
* Research on automobile pollution and alternative energy storage units (2007)

# Presentations

**Mishra, P.K.**,and Mishra, S (2020, June). *A Deductive Approach to Modeling the Spread of COVID-19*. Paper presented at Closing on COVID-19. American Association of Physicians of Indian Origin Virtual Summit 2020, Oak Brook, Illinois, USA.

**Mishra, P.K.,** Vijayan, S., Shetty, S., Mathew, M (2017, April) – *Surgical considerations for a case of recurring chondroblastic osteosarcoma*. Presented at the Orthopedics Clinical Pathological Conference, Kasturba Medical College, Manipal, KA, India.

**Mishra, P.K.**, Singh, R. (2017, February). *A Tale of Two Cities – Invasive Rhabdomyosarcoma and International Comparison of Tertiary Center Management.* Presented at Neurosurgery Grand Rounds, Pritzker School of Medicine, University of Chicago, Chicago, IL, USA.

**Mishra, P.K.**, Singh, R. (2016, August). *Invasive Rhabdomyosarcoma of the Nasopharynx and Cranium in a 21-year-old male*. Presented at Illuminati, Armed Forces Medical College, Pune, India.

**Mishra, P.K.**, Lang, D., Efimov, I. (2011, August). Induction of ventricular fibrillation: the compensatory role of proline-rich tyrosine kinase 2 in hypertrophic mice hearts. Poster session presented at Undergraduate Research Symposium, Washington University in St. Louis, St. Louis, MO, USA

Jackson, G.P, **Mishra, P.K.** (2006, August). *Interstellar transport using nuclear sails*. Non-speaking participant at New Trends in Astrodynamics and Applications III, Princeton University, Princeton, NJ, USA

# Publications

**Mishra, P.K.** and Mishra, S. *A Deductive Approach to Modeling the Spread of COVID-19*. preprint, Epidemiology, 30 Mar. 2020. *DOI.org (Crossref)*, [doi:10.1101/2020.03.26.20044651](https://doi.org/10.1101/2020.03.26.20044651).

**Mishra, P. K.** and Mishra, S. (2020). COVID-19 Dashboard. Zenodo. <https://doi.org/10.5281/ZENODO.4394300>

# E-Books

**Mishra, P.K.** (2011). *The Move-Up Guide: Standard Operating Protocols for an EMT-B*. Self-published

# Software

**PREPAREDx: An end-to-end communication and workflow solution that improves emergency care outcomes**

Cellular-based, cost-effective, end-to-end encrypted communication system between ambulance services and emergency departments

# Conferences Attended

American Association of Physicians of Indian Origin (AAPI) – 2020

Armed Forces Medical College (AFMC) - 2016

Indo-German Convention of Lindau Alumni (IGCLA) – 2014, 2015, 2016

Chirurgia – 2014, 2015

Manipal Conventus – 2014, 2015

# Leadership Experiences

**Committee Member - Rush Postdoctoral Society (2021-present)**

* Coordinate seminars and workshops aimed at improving the postdoctoral experience at Rush University for over 60 members
* Integration with the Mentoring Programs Office which promotes placement of postdoctoral fellows and independent research
* Representative to the National Postdoctoral Association

**Vice President of Administration - Kasturba Medical College Student Council (2016-2017)**

* Propositioned college administration for the first elected student council, with additional positions to advance student responsibilities and financial independence
* Elected to represent 1,000 medical students on issues primarily concerning academics, room & boarding, student safety, and overall medical school experience
* Advocated and negotiated for the student body in meetings with student interest groups, faculty heads, college/university administration, and local public officials
* Compiled student data and interviewed for national/international academic accreditation agencies

Representing Kasturba Medical College, Manipal (KMC):

* New York State Education Department
* National Assessment and Accreditation Council

Representing KMC Medical Students

* Dean’s Committee
* Executive Committee
* Judicial Committee
* First Year Orientation
* Second Year Orientation
* Cultural Committee
* Mess Committee
* Hostel Committee
* Indo-German Convention of Lindau Alumni
* International Quiz for Medical Undergraduates

**Cutting Edge Surgical Society at Manipal University (2014-2017)**

* General Secretary (2017): Set society schedule. Coordinated with surgical faculty on providing guest lectures and student opportunities. College administration liaison
* Webmaster (2014-2016): Developed and maintained cuttingedgemanipal.com
* Core Committee Member (2014-2017): Instructed student peers in basic surgical skills including knots, suturing, lumbar puncture, catheterization, ophthalmoscopy, otoscopy
* Organizer of the Chirurgia surgical conference (2014, 2015)

**Indo-German Convention of Lindau Alumni (2014-2016)**

* Founding committee member of an international medical research conference
* Organized the abstracts, oral presentations, public relations, and technical support
* Webmaster: Created and maintained manipal-igcla.com (deprecated)

**Kasturba Medical College Student Research Forum (2014-2016)**

* Coordinated academic sessions and research workshops
* Webmaster: Created and maintained kmcsrf.com (deprecated), social media
* Organizer of Conventus (2014, 2015) – a regional medical research conference. Organized oral presentations and technical support

**Utsav – Manipal University’s Inter-collegiate Competition (2015-2016)**

* Represented the medical student interests at university-wide meetings
* Coordinated the training and participation of 34 college teams
* Participant: Music director and DJ of 7 events (2015-2016)

**MIST + Verve – KMC’s Inter-Medic Competitions in Sports and Fine Arts (2014-2016)**

* Merged KMC’s national medical student sports competition with fine arts competition in 2016 as a prototype megafestival for 2017, what is now known as Invictus.
* Coordinated the financial resources, fundraising, scheduling, volunteer personnel
* Verve participant: dance, debate, fashion show (2014-2016)

# Volunteer Experiences

**Alumni and Parents Admission Program – Washington University in St. Louis (2018-present)**

* Conduct interviews for undergraduate applicants

**Rural Medicine Camp – Department of Community Medicine, KMC, Manipal (Sept 2019)**

* Screen patients for hypertension, diabetes, COPD, cardiac disease
* Provided patient education on diet, exercise, management of chronic conditions

**Ophthalmology Camp – Department of Ophthalmology, KMC, Manipal (June 2018)**

* Evaluated patients for refractive errors and provided free glasses
* Screened patients for cataracts, diabetic/hypertensive retinopathy

**Pulse Polio – Universal Immunization Programme, Gov of India (Feb 2016)**

* Program serves to administer oral polio vaccine to every child, 0-5 years of age, nationwide, irrespective of previous vaccination status
* Mobile unit: Traveled door-to-door across regional slums, administered vaccine

**Each One Teach One, Manipal, KA, India (Summer 2016)**

* 9th grade mathematics tutor at local school

**Missouri Show-Me Response (2012-2016)**

* Member of St. Louis City Medical Reserve Corp

# Professional Memberships

American College of Surgeons (2016 – present)

American Association of Physicians of Indian Origin (2019 – present)

American Association for the Advancement of Science (2019 – present)

National Postdoctoral Association (2021-present)

American College of Emergency Physicians (2020-2021)

Emergency Medicine Residents Association (2020-2021)

# Languages

Bilingual in English and Hindi

Medical proficiency in Kannada

# Interests

**Programming**

* Web Development: Drupal, WordPress, LEMP stack, Traefik
* Virtualization: Docker, Ubuntu VM
* Automation: Node-Red, Hass.io
* Currently learning: Python, Shell

**Xtasis Tracks: Music Production and DJ**

* Consultant amateur audio engineer for nationally competing dance teams in the US and India
* Produced mixes for over 20 major events, including dances and fashion shows, at Manipal University

**Dance: Bollywood and Fusion**

* American Born Desi Crew (WashU’s fusion dance team). Captain 2011-2012
* WashU Masti (Bollywood) (currently named WashU Chaahat). Captain 2010-2011, Dancer 2008-2011