Shivay Parihar

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Education

Dr. Sampurnanand Medical College   *Jodhpur, India*

Bachelor of Medicine and Bachelor of surgery   *August 2017 - March 2023*

- **Courses:** Human anatomy, biochemistry, human physiology, pathology, microbiology, pharmacology, general medicine, general surgery, dermatology, otorhinolaryngology, ophthalmology, community medicine, anesthesiology, orthopedics, radiology, psychiatry, pediatrics, emergency medicine, obstetrics and gynecology, respiratory and tuberculosis medicine, and forensic medicine

Publications

JOURNAL ARTICLES

Parihar S, Kaur RJ, Singh S. Flashback and lessons learnt from history of pandemics before COVID-19. J Family Med Prim Care. 2021 Jul;10(7):2441-2449. doi: 10.4103/jfmpc.jfmpc_ 2320_ 20.

Prevalence of premature hair graying, its association with lifestyle and sociodemographic factors in medical students in Rajasthan, India: submitted to Journal of Medical Evidence(In production-2023 next issue)

CONFERENCE PRESENTATIONS, POSTERS, TALKS

2018 poster presentation titled "Use of Placebos as an alternative remedy to reduce drug burden in the elderly" at Indian academy of geriatrics.

2021 Oral presentation at the National Biomedical research competition titled "RNAi screening to identify epigenetic regulators of dietary restriction mediated endoplasmic reticulum hormesis and longevity."

2023 Science model presentation at Open house-Indian Institute of Technology, Jodhpur. Demonstration of nanoparticle biodistribution, targeting and clearence in the human body to the common public.

Work Experience

Dr. S.N. Medical College and group of affiliated hospitals   *Jodhpur, India*

Provisionally registered doctor   *Mar 2022 - Mar 2023*

- Diagnosed and managed common ailments in the branches of medicine and surgery.
- Part of compulsory 1 year hospital training of MBBS
- Rotated through 17 departments in 4 hospitals around Jodhpur, while learning diagnostic procedures, sampling, treatment protocols, prescriptions, and emergency maneuvers.

Research Projects

Nanoparticle targeted clearance of Senescent cells   *Jodhpur, India*

Indian Institute of Technology   *Jul 2022 - Current*

- Design and characterization of functionalized mesoporous silica nanoparticles(MCM-41) for targeted drug delivery
- MCM-41 particles selectively targeted to deliver senolytic drugs to senescent cells.
- Learnt more than ten types of nanoparticle synthesis and characterization techniques
- **Senescence studies:** oxidative damage induced senescence(SIPS) in murine fibroblasts(NIH/3T3), Beta-gal staining assay(x-gal), Flow cytometry for cell cycle arrest, chemotherapeutic(Doxorubicin) induced senescence in A549, SH-SY5Y cell lines, p-53 western blotting, Senescence associated inflammatory phenotype(SASP) q-PCR.

Identification of epigenetic regulators of Dietary restriction mediated ER-hormesis   *New Delhi, India*

National Institute of Immunology   *Aug 2021 - Oct 2021*

- Used RNA interference screening to identify epigenetic regulators of dietary restriction-mediated endoplasmic reticulum hormesis and longevity using C. elegans as a model organism. Identified 5 epigenetic regulators using the RNAi screen, which will be further confirmed by using other stress reporter assays, RT-PCR during ER stress induction, and Chip analysis.
- eat-2(-) mutant C. elegans used as dietary restriction model with GFP linked to hsp-4 to study ER-stress
- one conference presentation.

Identification of promoter methylation of longevity genes SIRT1, FOXO3 AND MTOR. *Online*

University of Hyderabad *Jun 2021 - Aug 2021*

- Investigated changes in CpG methylation at promoters of longevity genes with age
- Part of Summer research fellowship for Indian academy of sciences
- Learnt about online epigenomics data access and analysis
- **Technical Skills:** Genome Browser, gene regulatory elements analysis, MethBase data extraction, and analysis.

Epidemiology of Premature Hair Graying *Jodhpur, India*

Dr. S.N. Medical College *April 2019 - September 2019*

- First study of premature hair graying from the region of Western Rajasthan as well as the first study of premature hair graying in medical students from India.
- Prevalence estimation, identification of correlation with lifestyle, family history and sociodemographic factors.
- **Technical Skills:** Study design, Sample size calculation, questionnaire preparation and validation, statistical analysis, manuscript writing.
- one publication and one Indian Council of medical research STS- project selection.

Skills

Biochemistry and molecular biology wet-lab techniques gDNA/RNA/plasmid DNA isolation and quantification, protein/RNA isolation and quantification, ELISA, PCR, RT-PCR, Gel Electrophoresis, Western blotting, SDS-PAGE, Flow cytometry, RNA-interference, Bisulfite/methylation-specific PCR.

C. elegans handling C. elegans growth, handling, and experimentation (worm feed preparation, picking and transferring of worms, Tunicamycin induced ER-stress assay, osmotic stress assay developmental stage identification, RNA interference screening, bleaching, and developmental stage synchronization, strain revival and freezing, worm stacking, and fluorescence imaging; dietary restriction protocols in C. elegans-peptone dilution, bacterial concentration dilution, and eat-2 mutants)

Cell culture Cell line handling: establishment, freezing and revival, cell counting, passaging, contamination detection and troubleshooting, cell staining and treatment.

CRISPR/cas9 Knock-out and knock-in model generation strategies, preparation of sgRNA constructs, in-vitro transcription, genotyping strategies for F0 founders, experience with SnapGene software.

Nanomaterial synthesis and characterization (Gold naoparticles, gold nanorods, mesoporous silica nanoparticles, Amino functionalized mesoporous silica nanoparticles, carbon quantum dots) (UV-visible spectroscopy, FT-IR spectroscopy, Thermogravimetric analysis, BET adsorption/desorption analysis, Field emission-scanning electron microscopy sample preparation)

Bacterial culture LB agar plate preparation, streaking of bacteria, primary and secondary culture inoculation, strain revival and freezing, calculation of CFU/ml and calibration curve preparation with optical density.

Programming Python (libraries: NumPy, pandas, scikit-learn; software: Anaconda, VS code), R (Linux environment basics, ggplot, dplyr, siqnr, biostrings, next-generation sequencing analysis, methylation sequencing analysis).

Data analysis Epi-info, SPSS, JASP, Galaxy online genomics analysis, GraphPad, Origin, Microsoft Excel.

In-silico drug discovery Pharmacokinetic(ADMET), Pharmacodynamic analysis, Toxicity studies(Toxtree, Toxread, QSAR), Molecular docking(Autodock Vina)

Lab animal experiments Zebrafish handling, anesthesia, and necropsy. Handling, restraint, blood collection, dosing(IO, IV, IP), anesthesia, and necropsy of mice, and rats. Handling, restraint, and blood collection of guinea pigs and rabbits

Achievements

2017 **All India Rank 981** in **NEET-2017-** All India pre medical entrance with 1,138,890 appearing students.

2018 **Winner** Poster presentation at the conference of Indian academy of Geriatrics, Jodhpur

2019 **Short term studentship award**, Indian council of Medical research (Ref. No.- 2019-05283)

2021 **Summer research fellow** for the Indian and National academies of sciences (Id:LFS2592)

2023 **Winner- MEDHA preliminaries** Medical device hackathon at IIT-Jodhpur

Courses and certifications

2018 Research methodology and scientific paper writing workshop, Conference of Indian Academy of Geriatrics

2019 Health research fundamentals, National Institute of Epidemiology (elite class certificate)

2020 Biostatistics and design of experiments, IIT Madras, 2020(elite class certificate)

2020 Computing in Python I, II, III, IV, Georgia Tech, (edX)

2020 Using Python for Research, Harvard University (HarvardX PH526x), (edX)

2021 Using galaxy for genomic data analysis- Harvard university, (Coursera)

2022 Hands-on Genome editing using CRISPR/cas9 workshop at National center for biological sciences, Bengaluru

2022 One Month International Workshop by Decode Life on Data Science Machine Learning for Bioinformatics with "R"- from September 26 to October 22, 2022.

2023 Decode Life- One Month International Workshop by Decode Life on Bioinformatics and data science with R and SQL- from April 15 to May 16, 2023

2023 Workshop on Laboratory animal handling and management, Tamil Nadu Veterinary and Animal Sciences University, from May 16 to May 26, 2023

Languages

English   TOEFL score- 117/120 (Reading[30], Listening[29], Speaking[28], Writing[30]
Hindi   Native proficiency

All references available upon request.