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Research Interests:

My research interests encompass harnessing the potential of NMR and MRI techniques for advancing disease understanding, diagnosis, and staging, particularly in disease progression and drug response assessment. Additionally, I aim to delve into the applications of NMR and MRI in toxicology, elucidating mechanisms of toxicity and exploring novel avenues for intervention. Moreover, I am keen on natural product-based drug development, integrating scientific validation of traditional knowledge to unlock therapeutic potential and address unmet medical needs effectively.

Member of scientific society

- National Magnetic Resonance Society (NMRS)
- Asian Society of Magnetic Resonance in Medicine (ASMRM)
- Society of Biological Chemist (SBC)
- Indian Academy of Neurosciences (IAN)

Key research contributions:

- Evaluated natural products for pharmacology and safety profile
- Structure characterization for isolated natural compounds using NMR
- Phyto metabolomics for chemosensory fingerprinting of medicinal plants
- Evaluated yoga induced changes in ischemic stroke patients by MRI

Publications:

1. Jayasundar R, Ghatak S, **Kumar D**, Singh A and Bhosle P, No ambiguity: Chemosensory-based ayurvedic classification of medicinal plants can be fingerprinted using E-tongue coupled with multivariate statistical analysis. *Front. Pharmacol*, 2022; 13:1025591.
2. **Kumar D**, Singh A, Jayasundar R. Challenges in using Electronic tongue to study rasa of plants: II. Impact of solvent and concentration on sensor response and taste ranking, *J Ayurveda Integr Med*, <https://doi.org/10.1016/j.jaim.2020.12.010>
3. Shankar GA, Venkatasubramanian U, Alagawadi KR, **Kumar D**, Kavalapure RS, Ranade SD, Soundarya P, Jalalpure SS. Synthesis, molecular docking and ADME studies of thiazole-thiazolidinedione hybrids as antimicrobial agents. *Journal of Biomolecular Structure and Dynamics*. *J Biomol Struct Dyn*. 2021, 4;1-17. doi: 10.1080/07391102.2021.1880479.

4. Jayasundar R, Singh A, **Kumar D**. Challenges in using electronic tongue to study rasa of plants: I. Finding the right tool for the right job, J Ayurveda Integr Med, <https://doi.org/10.1016/j.jaim.2020.12.011>
5. Purwar S, Bhattacharya D, Metgud SC, **Kumar D**, Chitambar SD, Roy S. A cross-sectional study on aetiology of diarrhoeal disease, India. Indian J Med Microbiol. 2016; 34: 375-379.
6. **Kumar D**, Patil PA, Roy S, Kholkute SD, Hegde HV, Nair V. Comparative toxicity profiles of *Plumbago zeylanica* L. root petroleum ether, acetone and hydroalcoholic extracts in Wistar rats. Ayu. 2015; 36 (3): 329-334.
7. **Kumar D**, Ganguly K, Hegde HV, Patil PA, Roy S, Kholkute SD. Spasmolytic effect of traditional herbal formulation on guinea pig ileum. J Ayurveda Integr Med. 2015; 6(3): 194-7.
8. **Kumar D**, Hegde HV, Patil PA, Roy S, Kholkute SD. Safety evaluation of petroleum ether, acetone, hydroalcoholic extracts of *H. integrifolia* by oral administration in wistar rats. Asian J Pharma Clin Res. 2015; 8(2): 185-189.
9. **Kumar D**, Ganguly K, Hegde HV, Patil PA, Roy S, Kholkute SD. Activity of *Plumbago zeylanica* Linn. root and *Holoptelea integrifolia* Roxb. bark pastes in acute and chronic paw inflammation in Wistar rats. J Ayurveda Integr Med. 2014; 5(1): 33-7.
10. Alegaon SG, Alagawadi KR, Garg MK, **Kumar D**, Vinod D. 1,3,4 Trisubstituted pyrazole analogues as promising anti-inflammatory agents. Bioorganic Chemistry, 2014; 54: 51–59.
11. **Kumar D**, Hegde HV, Patil PA, Roy S, Kholkute SD. Antiulcer activity of water soaked *Glycine max* L. grains in aspirin induced model of gastric ulcer in Wistar rats. J Ayurveda Integr Med 2013; 4: 134-7.

Research Project

- Immunomodulatory effects, protease inhibitory activity and spectroscopic characterisation of select ayurvedic prophylactics and formulations: In vitro studies for novel SARS Cov infection
- Scientific validation of ayurvedic concept of guna and anupana by studying its interplay with NMR Phyto-metabolomics and permeability analysis in intestinal and liver cells
- Semi automatic and classification of MR images through ischemic stroke as case studies