

Research

ISHS-CCIH has been engaged in various research activities. It has been involved in evidence-based Ayurveda and integrative medicine as well as meta-research, analysis, policy advocacy and thought leadership in AYUSH research. CCIH team is contributing to development of research methods, protocols and tools and development of reporting standards for publication and documentation. Ethnopharmacology, bioprospecting including botanical sourcing, natural product formulation discovery, network pharmacology, chemoprofiling are key research areas of CCIH. It has projects on pharmaceuticals, herb-drug interactions, PK/PD studies and nutraceuticals. The health research areas include pharmacoepidemiology, observational studies, protocols and RCTs and whole system studies. CCIH has a focus on mainstreaming potentials of AYUSH to address public health challenges, revitalization of traditional health practices like child care, health seeking behavior, *Swasthavritta* and NCDs prevention.

Completed Projects:

- Network ethnopharmacological investigation for natural phosphodiesterase inhibitors (2015 – 2017)
The University Grants Commission under 12th Plan sanctioned an amount of Rs. 5,00,000/-. The investigators of this project are Prof. Bhushan Patwardhan (PI) and Dr. Uma Chandran (Co-PI).
- Pharmacoepidemiology
 1. Study of use of traditional medicine among students and faculty members in academic institutions (2016-2017)
An online questionnaire-based study to find out use of traditional medicine among students and faculty members in academic institutions affiliated to SPPU.
 2. Study of health seeking behavior of residents in Pune city (2013-2016)
A cross-sectional study conducted as a part of Applied Research Methods course The project included survey of 1400 households for the assessment of their health seeking behaviour.
- Herb-Drug Interactions (2013 – 2015)
Herb-Drug interaction studies between prescription drugs and herbal drugs during treatment of diabetes were carried out *in vivo*. Dr. Patwardhan was the Principal Investigator of this project and it supported by Board of College and University Development (BCUD), Savitribai Phule Pune University. Amount of INR 3,00,000/- was received for a duration of two years.
- AyuGenomics (2007 – 2011)
'Genomic Variation Analysis and Gene Expression Profiling of Human Dosha Prakriti based on Principles of Ayurveda'. Funding to the extent of INR 11 million was granted. It was supported by the Office of Principal Scientific Advisor to Government of India.

- Vaccine adjuvant (2004 – 2007)
A major project entitled ‘Development of novel herbal adjuvants for vaccines’ was undertaken in collaboration with India’s largest vaccine manufacturing company- Serum Institute of India Pvt. Ltd. A grant of INR 15 million was provided by Department of Science & Technology, Government of India.
- AyuSoft (2003 – 2006)
‘Development of AyuSoft – An intelligent decision support system based on Ayurvedic knowledge’ was conducted in collaboration with Center for Development of Advance Computing (C-DAC), Pune. This project was supported by Department of Information Technology, Government of India with a grant of INR 30 million.
- New Millennium Indian Technology Leadership Initiative (NMITLI) (2002 – 2006)
A national network project ‘Development of Ayurveda based formulations for treatment of arthritis’ was undertaken in collaboration with over 14 leading national research laboratories and industry partners. The arthritis component of the NMITLI project received a grant of INR 35 million from the Council for Scientific and Industrial Research (CSIR), Government of India.

Ongoing projects

Center of Excellence for ‘preclinical study on development of therapeutic adjuvants based on Ayurveda’

PI: Prof. Bhushan Patwardhan

Pilot Project PIs and Co-PIs

Dr. Dada Patil, Serum Institute of India Pvt. Ltd., Pune.

Dr. Govind Ragupathi, Memorial Sloan Kettering Cancer Center, USA.

Dr. Kapaettu Satyamoorthy, School of Life Sciences, Manipal University, Manipal.

Dr. Manish Gautam, Serum Institute of India Pvt. Ltd., Pune.

Dr. Mayurika Lahiri, Indian Institute of Science, Education and Research, Pune

Dr. Mohan Wani, National Centre for Cell Sciences, Pune

Dr. Sunil Gairola, Serum Institute of India Pvt. Ltd., Pune

Dr. Suresh S Jadhav, Serum Institute of India Pvt. Ltd., Pune

Duration: 3 years, 2017 – 2020

Ministry of AYUSH, Govt. of India has awarded a center of excellence (CoE) for ‘preclinical study on development of therapeutic adjuvants based on Ayurveda’ under Central Sector Scheme. The objectives of this project are:

- To build collaborative research network of premium institutes from India and abroad for strengthening interdisciplinary research in AYUSH.
- To demonstrate value of AYUSH and interdisciplinary approaches in management of Non-communicable diseases (NCDs). This has been planned through a pilot research project to study adjuvant therapies for cancer (CA) and rheumatoid arthritis (RA) for

therapeutic benefits and improve Quality of Life (QoL). This project is in collaboration with reputed organization/ institutes such as National Centre for Cell Sciences, Pune; Indian Institute of Science, Education and Research, Pune; Serum Institute of India Pvt .Ltd., Pune; School of Life Sciences, Manipal University, Manipal; and Memorial Sloan Kettering Cancer Center, USA.

- To facilitate human resource development, trans-disciplinary research and capacity building through training, credit courses and fellowship programs for AYUSH sector.

To develop strategies based on policy and analysis, epistemology relevant research methodologies and innovative research ideas based on AYUSH knowledge systems

2. Trans-disciplinary Research Fellowship Grant

PI: Prof. Bhushan Patwardhan

Duration: 3 years, 2017 – 2020

The Department of Health Research (DHR), Ministry of Health and Family welfare, Government of India has awarded a research fellowship grant under Human Resource Development (HRD) scheme. This grant is for specialized training with interdisciplinary curriculum and research capacity building of medical faculty from Universities/ colleges of AYUSH and biomedical sciences. The fellowship program will provide exposure to contemporary advances in disciplines like public health, cell biology, epidemiology, biomedical engineering, pharmaceuticals, clinical pharmacology, immunology and pharmacogenomics.

3. Network ethnopharmacological characterization of Ayurvedic nootropic botanicals

PI: Prof. Bhushan Patwardhan

Co-PI: Dr. Uma Chandran

Duration: 2 years, 2016- 2018.

The Board of College and University Development (BCUD), Savitribai Phule Pune University has sanctioned the project grant to perform this study. The study aimed the network ethnopharmacological characterization of five nootropic botanicals to understand the logic of traditional use of these in one of the neurodegenerative diseases, Alzheimer's disease (AD). The botanicals selected for the study are *Bacopa monnieri*, *Centella asiatica*, *Withania somnifera*, *Embllica officinalis* and *Tinospora cordifolia* were aimed to study.