



DEPARTMENT OF NUCLEAR MEDICINE & PET ALL INDIA INSTITUTE OF MEDICAL SCIENCES



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Statement regarding my scientific pursuits which have not yet received any award:

All of us engage in scientific research, whether in basic or applied sciences, driven either by curiosity or the desire to solve pressing problems for humanity. When applied research leads to changes in global medical practice, it is truly remarkable. The pioneering work I led at AIIMS, New Delhi, in the field of thyroid cancer, revolutionized treatment protocols worldwide. Our research optimized the radioiodine dose for remnant thyroid cancer ablation to just 30 mCi, saving millions of dollars, reducing unnecessary radiation exposure to patients, minimizing environmental hazards, and enabling outpatient treatment without hospitalization. This work was recognized in the 2015 ATA Guidelines for the management of DTC (**Recommendation 55A - Strong Recommendation, High-Quality Data**). This investigator-initiated research has transformed global medical practice.

In addition to this, my research has explored alternatives to second surgery (completion thyroidectomy) (**Recommendation 38B**) and advanced pediatric thyroid cancer treatment, contributing significantly to clinical practice, with five of my papers cited in the 2015 Pediatric DTC ATA Guidelines.

My latest ground-breaking research on “Optimal Cumulative I-131 Activity in Metastatic Differentiated Thyroid Cancer: Balancing Efficacy and Adverse Events. In press (J Clin Endocrinol Metab. 2024 Jan 12;dgae024. doi: 10.1210/clinem/dgae024. Epub ahead of print. PMID: 38214553)” enhances the cumulative activity cut-off from 600 mCi to 1000 mCi likely to change the guidelines.

I have also contributed to neuroendocrine tumor research and metastatic castrate-resistant prostate cancer (mCRPC), advancing both imaging and therapy, placing India at the forefront of Alpha-radionuclide therapy (TAT) research.



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I have conducted extensive research in the field of radiopharmaceutical development and translation, moving innovations from bench to bedside. My work has spanned various cancers, including prostate cancer and neuroendocrine tumors, where I have significantly advanced radionuclide therapies such as [177Lu]Lu-PSMA-617, [225Ac]Ac-PSMA-617, and FAPI-based radioligand therapies. Through meticulous studies, I have optimized dosing protocols, enhanced imaging accuracy, and demonstrated the efficacy of these therapies, ultimately improving patient outcomes and advancing clinical practices globally. My work spans a wide range of cancers, including radioiodine-resistant follicular and para-follicular thyroid cancers, end-stage breast cancers, glioblastoma multiformes, and sarcomas.

As co-inventor of fibroblast activation protein (FAP) inhibitors, I pioneered a novel therapeutic strategy targeting the tumor microenvironment, offering new hope for patients with advanced-stage cancers that resist conventional therapies. In collaboration with the University of Mainz, Department of Chemistry, I played a crucial role in advancing pharmaceutical FAP inhibitors by transitioning from monomers to dimers. This evolution significantly improved pharmacokinetics, extended tumor retention times, and reduced radiation exposure to non-target tissues. I was instrumental in reengineering FAP inhibitors into both homodimer and heterodimer molecules and was the first globally to radiolabel Gallium-68, Lutetium-177, and Actinium-225 with FAP inhibitors. This innovative approach has been applied in the treatment of approximately 100 thyroid cancer patients, 25 breast cancer patients, and 10 sarcoma patients, yielding promising therapeutic outcomes.

For these research activities on thyroid cancer and FAPI theranostics, I have not received any award.

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The research work under reference has been carried out after February 2004. This has not been given any award. In all these works Dr. Chandra Sekhar Bal conceptualized this study and led the team to enroll the subjects, their investigations, analysis and publishing this study as corresponding author. All the work including patient enrollment and laboratory investigations were carried out in the Department of Nuclear Medicine, thyroid cancer clinic at AIIMS, New Delhi.

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