

ONE-PAGE WORK DONE IMPACT BRIEF

Academic, Scientific, Institutional and Societal Contributions of Dr. Rakesh Kumar Singh, Head of Centre for Nanoscience and Nanotechnology and former Registrar & Proctor of Aryabhatta Knowledge University (AKU), Patna

21+ years of contribution	7 Research laboratories Establishment	150+ research publications	9 patents / prototypes	75+ citing countries of world
------------------------------	---	----------------------------------	---------------------------	-------------------------------------

CORE IMPACT. Over more than 21 years, Dr. Singh has integrated teaching, research, institution-building, mentorship, innovation, science outreach and academic governance to create a public-facing Nanoscience and Nanotechnology ecosystem in Bihar. The record shows sustained conversion of frontier knowledge into research infrastructure, intellectual property, trained manpower, start-ups and affordable research and academic work serving public welfare.

- **Institution-building and visibility.** Led the development of seven advanced interdisciplinary laboratories at AKU and helped establish the Centre as a recognized research hub. The record reports 500+ visits by academicians, scientists, Vice-Chancellors, institutional leaders and industry representatives, with appreciation from public leaders and eminent scientists.
- **Research excellence and intellectual property.** Generated 150+ publications, nine patents/prototypes and seven new magnetic materials recognized by ICDD, USA. The work has received citations and academic recognition in 75+ countries of world; journal standing is further reflected by invitations to review research for 25+ international peer-reviewed journals.
- **Society-oriented Research.** Advanced the Waste-to-Wealth model by converting eggshell, rice husk and rice straw into functional nanomaterials for water purification, nano-fertilizers, environmental remediation, energy and electronics. Patents granted in 2026 for eggshell-derived nanomaterials and a yttrium-borate LED demonstrate movement from laboratory research toward affordable indigenous applications.
- **Indian Knowledge Systems and industry linkage.** Undertook scientific validation of Ayurvedic Bhasma as nanomedicine, medicinal herbs and agro-nanofood materials, linking modern characterization with indigenous healthcare knowledge. Collaboration with the National Institute of Ayurveda, Jaipur, Baidyanath Ayurveda and scholar-led ventures supports evidence-based research.
- **Human-resource and entrepreneurship impact.** Guided 15 Ph.D., 58 M.Tech. and 39 undergraduate researchers. Alumni contribute in IITs, universities, industry and start-ups, while achievements such as PMRF and DST-INSPIRE recognition evidence the quality of mentorship. Two research-scholar start-ups and one company extend laboratory knowledge toward enterprise and employment.
- **Outreach, recognition and governance.** Delivered or presented 150+ invited talks, including at Stockholm, Poland and organized or coordinated 100+ conferences, workshops and scientific programmes. A decade of National Anveshika Network of India(NANI) and National Anveshika Experimental Science Skill Test(NAEST), coordinated by Padma Sri Prof. H C Verma IIT Kanpur engagement and created Nature assisted Physics/Science teaching at all levels of studies, participation in national education initiatives, service on academic/statutory bodies, and The Chancellor Award for Best Young Teacher with research contributions in modern field of Nanoscience with various others recognitions including outstanding teachers nomination by the Vice Chancellor demonstrate sustained public and institutional trust.

Conclusion. This record demonstrates contribution substantially public institution-building, research infrastructure, internationally visible interdisciplinary research, Research translation, human-resource development, entrepreneurship, outreach and governance. It is evidence of actual service impact and continuing institutional value, to be considered holistically with the governing statutes