

## **Curriculum Vitae**

### **Arvind Kumar Bansal, MPharm, PhD, FAAPS**

Professor and Head  
Department of Pharmaceutics  
National Institute of Pharmaceutical Education and Research  
(NIPER)  
Sector 67, S.A.S. Nagar, Mohali, Punjab, INDIA – 160 062



## **1 ACADEMIC QUALIFICATIONS**

- **Ph.D.** Pharmacy (Pharmaceutics and Drug Delivery Systems) from University of Delhi, Delhi, India on thesis entitled “**Development of an Improved Drug Delivery System using Prodrug Approach**” [1993]
- **M. Pharm.** **Pharmaceutics** from University of Delhi, Delhi, India [1988]
- **B. Pharm.** University of Delhi, Delhi, India [1986]

## **2 ADDITIONAL QUALIFICATION**

- Certificate course in “**Introduction to Intellectual Property**” conducted by World Intellectual Property Organization (WIPO) Academy, Geneva, Switzerland [2001]

## **3 PROFESSIONAL PROFILE**

### **3.1 Positions Held**

1. Professor and Head (2008-present), Department of Pharmaceutics, NIPER, S.A.S. Nagar, Punjab, India.
2. Associate Professor (2003-2008), Department of Pharmaceutical technology (Formulations), NIPER, S.A.S. Nagar, Punjab, India.
3. Assistant Professor (2000-2003), Department of Pharmaceutical Technology (Formulations), NIPER, S.A.S. Nagar, Punjab, India.
4. Senior Research Scientist and Group Leader at Ranbaxy Research Labs, Gurgaon, Haryana, India.
5. Research Scientist (1993-1995), J K Pharmaceuticals Shripati Singhanian R & D Centre (now called Regent Drugs Ltd., A division of Teva Pharmaceuticals, Israel) at Faridabad, Haryana, India.
6. Senior Research Fellow (1989-1993), College of Pharmacy (University of Delhi), New Delhi.

## 4 PROFESSIONAL PROFILE

### 4.1 Pharmaceutical Industry

During over 7 years of industrial R&D experience, the following were the job responsibilities–

#### ❖ **Generic Products**

- Actively engaged in business, regulatory and legislative decision making process for timely launch of generics products in the domestic and international market
- Conceptualised, evolved formulation strategies, developed and transferred the technology to production shop floor, of **over thirty products** comprising of Tablets (Conventional and Delayed Release), Capsules (Hard Gelatin and Soft Gelatin), Parenterals (SVP, LVP, BFS packs, Dry Powders), Ophthalmic Drops (Conventional pack and FFS packs), Oral Liquid Suspension and Dry Syrup.

#### ❖ **Drug Discovery and Development**

- Conceptualised and established a pharmaceutical research group focussing Preformulation and Formulation Development of New Chemical Entities (NCEs) leading to filing of two INDs. The activities of the group included characterization of physicochemical and physico-technical properties of the NCE, early formulation development, process development, fabrication of clinical trials batches and support to chemical and biology groups.

### 4.2 ACADEMIC

#### 4.2.1 Research and Teaching Experience

The main objective of my research program is fundamental molecular level understanding of solid-state properties and its role in drug delivery. Solid State Pharmaceutics enables understanding the role of material property on processing, stability and pharmaceutical performance. Drug discovery and development has undergone a paradigm shift with increasing stress on ‘compound optimization’ in the preclinical stage, to reduce the attrition rate in the later stages of drug development. Poor aqueous solubility and inadequate dissolution rate are the most common reasons of ‘pharmaceutical manning’ in the early drug development phase. Solid-state manipulation and amorphous systems are an attractive option, since they only involve modification of the physical form. Research experience in the area of –

- Pre-formulation profiling and formulation development of drug delivery systems
- Polymorphism, Pseudo-polymorphism, particle engineering, selection of salt form, improvement of oral bioavailability.
- Thermodynamic and kinetic characterization of amorphous form and development of ‘stable’ Amorphous Solid Dispersions.
- Developed a novel bottom-up platform technology for generation of Nanocrystalline Solid Dispersions (**NanoCrySP**).

- Biopharmaceutics and drug development, pharmacokinetics evaluation of drugs, development of pharmaceutical formulations, and identification of critical material attributes for implementation of QbD, Functionality of excipients.

#### 4.3 Number of Masters' and Doctoral Students

- Master students Graduated: ~150
- Ph.D. students Graduated: 20

#### 4.4 AAPS – NIPER Student Chapter-

- 4.4.1** American Association of Pharmaceutical Scientists (AAPS) is a premier international organization of pharmaceutical scientists. It provides a dynamic international forum for the exchange of knowledge among scientists to enhance their contributions to health, by offering timely scientific programs, ongoing education, opportunities for networking, and professional development. **NIPER students formed the AAPS-NIPER student chapter in December 2007 and I was the 'founding faculty adviser'.** The student chapter holds the prime objectives to promote participation of Indian students at various AAPS activities provide a forum for keeping abreast with latest advances in pharmaceutical sciences and facilitate professional development of students. Currently it has a membership of more than 30 students. Under my tenure as faculty advisor, the student chapter won an award **2020 AAPS Student Chapter Award**.

### 5 PROFESSIONAL AFFILIATIONS

- Member, American Association of Pharmaceutical Scientists (AAPS)
- Life member, Indian Pharmacy Graduates' Association
- Member, Indian Pharmaceutical Association
- Life member, Indian Society for Solid State Chemists and Allied Scientists
- Faculty Advisor, AAPS – NIPER Student Chapter (2008 and 2018 to 2020)
- Member, Society for Pharmaceutical Dissolution Science (SPDS)

### 6 AWARDS AND HONORS

1. Represented department of Pharmaceuticals, Ministry of Chemicals and Fertilizers, Government of India as a panellist in discussion **"Ecosystem for R&D and innovation: Moving up the value chain"**, held on 1<sup>st</sup> March, 2021; as part of INDIA PHARMA 2021 and INDIA MEDICAL DEVICES 2021.
2. Appointed as a member of Technical Committee to assist the Department of Pharmaceuticals in the **Production Linked Incentive (PLI) Scheme for Pharmaceuticals**, Ministry of Chemicals and Fertilizers, Government of India, December 2020.
3. Appointed as a member of **Screening Committee for according recognition of In-house R&D units of Industries and Scientific and Industrial Research Organizations (SIROs) under Industrial Research and Development Promotion Programme (IRDPP) of Department of Science and Industrial Research (DSIR)**, as representative on behalf of the Department of Pharmaceuticals, August 2020.
4. Appointed **Scientific Chair** for "Society for Pharmaceutical Dissolution Science", in 2017. A professional society formed with the objective of promoting the science and

technological development in the field of dissolution among pharmaceutical professionals, academia, students, and regulatory bodies.

5. Appointed as **guest editor** for the journal '**Trends in Analytical Chemistry**' of Elsevier (Impact Factor 8.428) for a special issue on 'Material Characterization', August 2019.
6. Awarded the **NIPER Innovation Award 2019** for the technology "Fast dispersing multilayered stabilized amorphous particles" on National Technology Day, 11<sup>th</sup> May, 2019. The award started by NIPER aims to fire-up and support innovative ideas in research in pharmaceutical field.
7. Awarded "**IPA-ACG Scitech Innovation Award 2018 for Best Innovative Development of Solid Dosage Form**", in recognition of NanoCrySP a technology platform for Nano Crystalline Solid Dispersion.
8. Conferred "**Award of Appreciation**" on National Technology Day in May 2017 and 2018 at NIPER- SAS Nagar, in recognition of significant contribution to the institute.
9. Appointed as **Member of Editorial Board** of the journal "Drug Development Research", published by Wiley.
10. Paper entitled "**Challenges in Translational Development of Pharmaceutical Cocrystals**", in the February 2017 Issue of the Journal of Pharmaceutical Sciences (JPharmSci), was selected by the journal's Editorial Team to be displayed under Features on the journal's new website <http://www.jpharmsci.org>.
11. Appointed as a member of '**Editorial Advisory Board**' of Journal of Pharmaceutical Sciences (JPharmSci) on January 1, 2017 for a period of three years.
12. Appointed member of the **Molecular Pharmaceutics - Editorial Advisory Board** in January 2017.
13. November 2016, awarded the prestigious **Fellow of American Association of Pharmaceutical Scientists (FAAPS)**, at AAPS Annual Congress at Denver, USA.  
I had the honour of being the only Indian, working in India, to receive the Fellow status of AAPS. AAPS has a strong commitment to the recognition of select AAPS members through their designation as Fellow. The primary criterion for election to Fellow status is professional excellence in the fields relevant to the mission of AAPS. Election to Fellow status is based on the individual's documented sustained level of superior and distinguished professional achievement and contributions in a relevant field.
14. **Guest Editor**, Special issue on Nanocrystals of 'Pharmaceutics', a journal published by MDPI (Multidisciplinary Digital Publishing Institute), Basel, Switzerland [March 2015]
15. **Guest Editor**, Special issue on nanotechnology of Journal of Excipients and Food Chemicals [December 2014]
16. **Editorial Board Member** of "Pharmaceutics", a journal published by MDPI (Multidisciplinary Digital Publishing Institute), Basel, Switzerland.
17. **Appointed as Editorial Board Member** of "Journal of Excipients and Food Chemicals", an open access journal published from USA, with affiliation to International Pharmaceutical Excipients Council (IPEC).
18. **Appointed as Editorial Board Member** of "Recent Patents on Drug Delivery & Formulation", a Journal published by Bentham Science Publishers Ltd.
19. **AAiPS Distinguished Educator and Researcher Award for the Year 2008**  
This award is given to a faculty member from a recognized Indian Pharmacy education and research center. The mission of American Association of Indian Pharmaceutical Scientists (AAiPS) is to provide a forum for discussion, continuing education, and exchange of ideas on advances in pharmaceutical sciences and technology.
20. **Appointed as Editorial Board Member of International Journal of Biosciences and Technology**

**21. Innocentive Award**, in the area of formulation development for 3 times (April 2005, May 2006, May 2007)

Innocentive ([www.innocentive.com](http://www.innocentive.com)) is a web-based community, managed by a sister concern of Eli Lilly, USA and facilitates pharmaceutical scientists to address challenges faced by chemical and pharmaceutical companies, from around the globe.

**22. OPPI (Organization of Pharmaceutical Producers of India (OPPI) Scientist Award 2006**

This award was conferred in September 2006, for outstanding contribution in the area of Pharmaceuticals. The OPPI, established in 1965, is a premier organization of research based pharmaceutical manufacturers in India.

## 7 EXPERT MEMBER

1. Expert member for Meeting of Expert Committee to review safety and tolerability of excipients such as Diethylene Glycol Monoethyl Ether (DEGEE) used in parenteral formulations and advice **Drug Controller General (India)** – March 2016
2. Expert member for Meeting of Technical Expert Committee for review of projects related to Drug (including Drug Delivery) at **Biotechnology Industry Research Assistance Council** (A Government of India Enterprise) – February 2016
3. Meeting to advise on IND studies of an herbal anti-stroke product at **Council of Scientific and Industrial Research**, Government of India, New Delhi – January 2015
4. Committee Member, 27<sup>th</sup> **Kerala Science Congress** at Camelot Convention Centre, Alappuzha, Kerala, India – January 2015
5. Member, Project Review Committee (PRC) for project proposal, **Department of Scientific and Industrial Research**, Government of India, New Delhi – January 2015
6. Committee Member, Project review committee Meeting to review Annual Progress Reports of 8 adhoc projects on Antimicrobial Resistance at **Indian Council for Medical Research**, New Delhi – November 2014
7. Member of Core Committee for **Punjab Biotechnology Incubator** (A Government of Punjab Enterprise) – since 2014
8. Expert opinion provided on numerous occasions to **National Pharmaceutical Pricing Authority** for 'non-application of provisions of Drugs Price Control Order 2013, under Ministry of Chemical and Fertilizers, Government of India.
9. External expert, Board of Research Studies, **Faculty of Pharmacy, Jamia Hamdard**, New Delhi in year 2014.
10. Chairperson of **Department of Scientific and Industrial Research** (Government of India) committee for monitoring of project sanctioned to a pharmaceutical company. March 2014
11. Member of Board of Post-graduate Studies in Pharmaceutical Sciences, **Panjab University**, Chandigarh, India – March 2014
12. Expert for providing opinion to **National Pharmaceutical Pricing Authority** for non-application of provisions of Drug Price Control Order (DPCO)-2013.
13. External expert member for committee on project related to use of melatonin for radio protection at Institute of Nuclear Medicine and Allied Sciences, **Defense Research and Development Organization**, Government of India – September 2013.
14. Member, 'Nurturing a new pan-CSIR drug pipeline- high intensity preclinical, clinical studies on lead candidates (CSIR-PDL) at **Indian Institute of Integrative Medicine (I.I.I.M)**, Jammu – 2014 to 2015

15. Committee Member, **Department of Biotechnology**, Government of India - Screening Committee Meeting at Amrita Institute of Medical Sciences, Kochi – July 2012
16. Department of biotechnology nominee – Institutional Bio-safety Committee at **Institute of Microbial Technology**, Chandigarh – 2011
17. Member, **Department of Biotechnology** expert committee on monitoring of clinical trials of curcumin in treatment of cancer – September 2009
18. Expert member for project approval committee of DST sponsored project entitled '**Survey of R & D requirements of industries in Punjab and Chandigarh**', at Punjab State Council for Science and Technology – 2008
19. Nominated as a **Member of Board of Studies in Pharmaceutical Sciences by the Syndicate of Panjab University**, Chandigarh – 2008
20. Expert member for the committee created by **Ministry of Chemicals and Fertilizers**, Government of India, to assess feasibility of creating NIPER – like institutes in different states of India - 2007
21. Member, Expert Committee for "Technical Audit and Certification of Plant & Machinery and other Fixed Assets of **Bengal Immunity Limited**", at Kolkata and Dehradun in June 2006.
22. Nominated as a Technical Expert for Procurement of Medicines by **Punjab Health Systems Corporation, Mohali** in January 2005.
23. Expert for conducting technical audit of manufacturing locations of **Indian Drugs and Pharmaceuticals Limited (IDPL)** in the year 2005 under the revival plan for IDPL, set up by department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers, Government of India.
24. Member of **FICCI (Federation of Indian Chambers of Commerce and Industry)** Pharmaceutical Committee for the year 2005.
25. Member of Program Expert Committee at **Indira Gandhi National Open University**, for Development of Course Work of Post-graduate course in Pharmaceutical Chemistry and Sales Management, February 2005.
26. Acted as an expert for the interview panel for the selection of post of Lecturer in the department of Pharmaceutics and Quality Assurance, **Jamia Hamdard**, New Delhi on March 1, 2004.
27. Represented NIPER as an expert in 2<sup>nd</sup> Meeting of the Technical Sub-committee of the **Governing and Technology Approval Board (GTAB) under the Credit Linked Capital Subsidy Scheme (CLCSS)** held at the o/o Development Commissioner – Small Scale Industries, Ministry of SSI, GOI, New Delhi on October 3, 2003.
28. Acted as an external expert for annual project evaluation of CSIR research scholars, at the **University Institute of Pharmaceutical Sciences, Panjab University**, Chandigarh in July and September 2003.
29. Acted as an external expert in **Conference of Vice-chancellors, Directors/Principals of Technical Institutes in Haryana** for revision of curriculum (Pharmacy specialization), on May 9, 2003.

## 8 REVIEWER FOR RESEARCH JOURNALS

- **AAPS Pharmaceutical Science and Technology**, the online Journal of American Association of Pharmaceutical Scientists
- **Crystal Growth and Design** (American Chemical Society)

- **CrystEngComm** (Royal Society of Chemistry)
- **Current Drug Delivery** (Bentham Publishers, UK)
- **Drug Development and Industrial Pharmacy** (Taylor and Francis)
- **Drug Discovery Today** (Wiley)
- **European Journal of Pharmaceutical Sciences** (Elsevier Publications)
- **European Journal of Pharmaceutics and Biopharmaceutics** (Elsevier Publications)
- **International Journal of Pharmaceutics** (Elsevier Publications)
- **Journal of Pharmaceutical and Biomedical Analysis** (Elsevier Publications)
- **Journal of Pharmaceutical Research**
- **Journal of Pharmaceutical Sciences**
- **Methods and Findings in Experimental and Clinical Pharmacology**
- **Molecular Pharmaceutics** (American Chemical Society)
- **PDA Journal of Pharmaceutical Science and Technology**
- **Pharmaceutical Research**, a Journal of American Association of Pharmaceutical Scientists
- **Pharmaceutical Technology and Development** (Taylor and Francis)
- **Pharmaceutical Technology**, a Journal published by Advanstar Publications, USA

## 9 SCIENTIFIC PUBLICATIONS AND PRESENTATIONS

### ❖ PATENTS

- **Granted Patents - 11**
- **Applied Patents - 26**

### ❖ PUBLICATIONS

Citations = 9199; h-index = 49; i10 –index = 147

- **Research articles - 181**
- **Review articles - 32**
- **Editorial - 02**
- **General articles - 19**
- **Book chapters - 08**
- **Presentations and Abstracts - 70**

## 10. INVITED LECTURES - 43

## 11. WORKSHOPS CONDUCTED at NIPER - 15

## 12. EXTRAMURAL FUNDING

- Co- Principal Investigator (PI) for project entitled **“Clinical evaluation of formulations based on NanoCrySP technology”**, sponsored by Biotechnology Industry Research Assistance Council (BIRAC), India. Initiated in 2018.
- Co- Principal Investigator (PI) for project entitled **“Enhancement of oral bioavailability of poorly water soluble drugs using NanoCrySP, a patented nanocrystalline solid dispersion technology developed at NIPER-SAS Nagar”**, sponsored by Biotechnology Industry Research Assistance Council (BIRAC), India. Initiated in 2016.
- Principal Investigator for the project **“Pre-clinical Development of penicillin Drug Delivery System for Prophylaxis of Rheumatic Heart Disease”**, sponsored by Indian Council of Medical Research (ICMR).
- Principal Investigator (PI) for project entitled **“Development and evaluation of Nanocrystalline Solid Dispersions of a poorly water soluble drug”** sponsored by Department of Science and Technology, India. Initiated in 2015.
- PI for project entitled **“Nanocrystalline Solid Dispersion of hesperetin with enhanced oral bioavailability for cancer treatment”** sponsored by Department of Biotechnology, India. Initiated in 2015.
- PI for Project entitled **“Enhancement of oral bioavailability of melatonin and evaluation of radio-protective efficacy in mice”** sponsored by Institute of Nuclear Medicine and Allied Sciences, DRDO. Completed in December 2014.
- Co-PI for Project entitled **“Centre for pharmaceutical nano-technology”** sponsored by Department of Science and Technology. Completed in June 2012.
- PI for Project entitled **“Design and characterization of nano-crystalline solid dispersions”** sponsored by Department of Biotechnology, India, completed in 2010.
- PI for Project entitled **“Salt forms for optimization of biopharmaceutical properties of drug substances”** sponsored by Department of Science and Technology, India. Completed in 2009.
- PI for Project entitled **“Development of optimized formulations of curcumin”** sponsored by Department of Biotechnology, India. Completed in 2008.

## 13. INTERACTION WITH THE PHARMACEUTICAL INDUSTRY

Globalization of Indian pharmaceutical industry has introduced new scientific, regulatory and intellectual property challenges in the area of drug discovery and development. The industry expects academic institution to respond to their emerging needs in research and development. Realizing this, our laboratory has established strong ties with the Indian pharmaceutical industry. Our research activities are broadly divided into pre-formulation profiling and development of Drug Delivery Systems. Pre-formulation activities include solubility, permeability, stability, compaction physics and compatibility studies. Our laboratory has developed expertise in material characterization including salt form selection, polymorph studies, surface characterization and crystal engineering. Based on the pre-formulation profile suitable interventions for improvement of aqueous solubility and permeability are applied.



Our laboratory has collaborated with numerous Indian and overseas pharmaceutical companies in the area of Solid state material characterization, Quantification of polymorphic forms, Formulation development of conventional / modified release formulations, Process optimization, Development of value added generics, Development of lyophilization cycle, technical support for patent litigation. We have completed more than ~650 projects for ~40 overseas and ~60 Indian pharmaceutical companies.

#### **14. TECHNOLOGY TRANSFERS**

We have developed a novel platform technology – NanoCrySP (Nanocrystalline solid dispersions), a ‘bottoms-up’ technique for the generation of nano-crystals, which has opened up avenues in the area of nano-crystal-based drug delivery. This technology is currently being scaled-up for clinical evaluation with an industry collaborator. A US and European patent has been granted for this technology while European and Indian patents are under examination.

#### **15. PERSONAL INFORMATION**

- Date of Birth: July 9, 1965
- Office and Correspondence Address:  
Department of Pharmaceutics (Block-E),  
National Institute of Pharmaceutical Education and Research (NIPER),  
Sector 67, S.A.S. Nagar (Mohali),  
Punjab, India – 160 062.
- E Mail Address: [akbansal@niper.ac.in](mailto:akbansal@niper.ac.in) and [bansalarvind@yahoo.com](mailto:bansalarvind@yahoo.com)
- Contact number +91-977 9777388