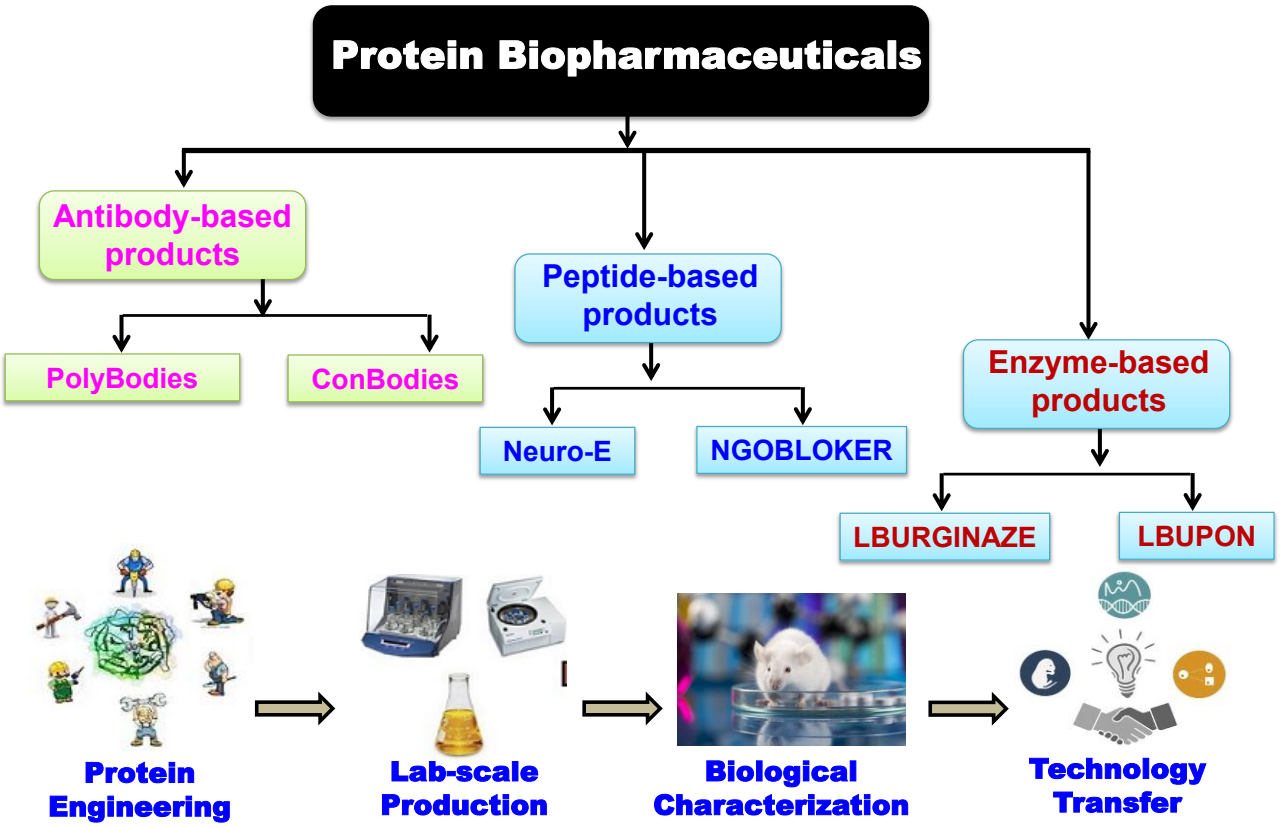
ABHAY H. PANDE
Professor
Department of Biotechnology
National Institute of Pharmaceutical Education and Research (NIPER)
Sector 67, SAS Nagar 160062, Punjab, India
Telephone: 0172-2214682-687, Mobile: 09463087776, 62809-79285
Email: apande@niper.ac.in; abbupande@yahoo.co.in

Research experience (**after PhD**): > 24 years (PhD defended Feb 2000)

Research Area - **Development of Protein Biopharmaceuticals**

It is evident now that, in coming decade, the domestic as well as the international market for protein biopharmaceuticals will grow rapidly and will expand its share of the entire pharmaceuticals market. There is a dire need to develop NOVEL protein biopharmaceuticals and make them Available and Affordable to Jan-Manas (common man). My laboratory is involved in the development of Protein Biopharmaceuticals and the details of current research programs are summarized below:



Programme 1 – Engineering antibodies and development of antibody-based biopharmaceuticals

In this program we are developing 2nd generation antibodies (PolyBodies™) as well as conjugated antibodies (ConBodies™) for clinical use.

- BiSpekDAb™, the first molecule we developed, is a bispecific antibody which targets both IL-23 & TNF-α and attenuates inflammation in animal models of inflammatory conditions (asthma, stroke, and others). (**patent # 17**). Detailed characterization of BiSpekDAb™ and other novel PolyBodies as well as ConBodies is currently going on in the lab (**patent # 12, 15, 16**).
- We are also engage in engineering and development of conjugated antibodies (ConBodies™) for therapeutic and diagnostic use.

Programme 2 – Engineering enzymes and development of enzyme-based biopharmaceuticals

In this program we are developing engineered enzymes, which are as follows:

- LBURGINAZE™ is engineered human arginase 1 enzyme. LBURGINAZE exhibit enhanced *in vivo* pharmacokinetic as well as potent anti-cancer activity in multiple cancer models (**patents # 8, 10, 11**). We are developing this molecule for the treatment of Liver cancer.

- LBUPON™ is an engineered human paraoxonase 1 enzyme that not only exhibits effective nerve agent-neutralizing activity but also possesses improved (*in vivo*) pharmacokinetic properties. Further characterization of LBUPON™ is currently going on (in collaboration with DRDE, Gwalior & IRBA, France) (**patent # 1, 2, 9, 14**).

- We are also developing safe, effective, and environmentally friendly SsoPox enzyme-based nanobioctatalyst for organophosphate decontamination. A panel of microbial enzymes is produced and immobilized on nanomaterials for efficient separation and reuse (**patent # 4, 5, 7**).

Programme 3 – Engineering peptides and development of peptide-based biopharmaceuticals

In this program we are developing engineered peptides, which are as follows:

- Neuro-E™ is apolipoprotein E-mimicking peptides which exhibit strong anti-inflammatory and neurohealing properties. Neuro-E shows promising results in animal models of inflammation (pulmonary inflammation, cardiac inflammation and neuroinflammation) (**patent # 3, 6, 13**).

- NGOBLOKER™ is engineered human endostatin molecule and has demonstrated desirable anti-angiogenic activity in the *in vivo* Chick Chorioallantoic Membrane (CAM) model. It is currently undergoing further characterization studies (**patent # 18**).

Technologies available for co-development:

BiSpekDAb™: Engineered Bispecific Antibodies for the Management of Multiple Inflammatory Conditions

1. Field: Chronic inflammatory diseases are significant burden on the global health. Recent scientific data suggest that targeting more than one cytokine (by one or more drugs) is more effective than targeting only one cytokine in controlling chronic inflammatory disease progression and associated symptom management.

2. Problem: TNF-α & IL-23 are key 'culprit' cytokines that are responsible for numerous inflammatory conditions. 06 TNF-α targeting biologics are approved and many more are being developed for *>35 diseases*. The market size of TNF-blockers is expected to reach USD 47.32 bn (CGAR of 3.59% for 2024-2029). Similarly, 04 IL-23 targeting biologics are approved and >35 companies are developing 24 IL-23 Inhibitors for *36 diseases*. Market size of IL-23 blockers is 24.3 billion in 2023 and will grow at 12% CGAR, 2024-2032. While, the available TNFα and IL23 blockers are effective, they target only one cytokine (either TNFα or IL-23) and this limit their overall effectiveness. Thus, there is an urgent need to develop more effective agent(s) for the treatment and management of chronic inflammatory conditions.

3. Need of the hour: Considering the success of TNF-α/IL-23 blocking biologics and their tremendous market size, there is an urgent need to develop biologic(s) that can target both IL-23 & TNF-α.

4. Our solution: BiSpekDAb™: Engineered bispecific antibodies that target both IL-23 & TNF-α.

PATENT STATUS:

Applied

TRL STATUS: TRL3/4

BiSpekDAb™

SPECIFICATIONS OF TECHNOLOGY:

1. **Dual Action Mode**: Novel engineered biologics that can target two different cytokines
2. **Unique structural design**: Permits good structural stability
3. **Simple-n-cost effective production platform**: High yield clone (*P pastoris*) and simple production process
4. **Superior efficacy**: Target TWO pro-inflammatory cytokines (IL-23 & TNF-α) and effectively ameliorate inflammation by regulating IL-23/TNF-α signaling pathways
5. **Protected intellectual property**: Indian patent filed; Freedom-to-operate (FTO) analysis ensures no infringement on existing products.
6. **Made In India !!!**

LBURGINAZE™: Engineered Human Arginase 1 for the Treatment of Liver cancer

1. Field:
Liver cancer, the sixth most common cancer globally and the second-leading cause of cancer-related deaths, presents a critical public health threat. Diagnosis often occurs in advanced stages of the disease, aligning incidence with fatality rates.

2. Problem:
There are various treatment strategies available for liver cancer, including surgery, transplantation, and radiotherapy, which are typically used for early-stage cases. For intermediate and advanced stages, chemotherapy is commonly administered; however, it is associated with serious toxicity issues. Even at maximum doses, chemotherapy extends median survival by only 3-6 months. Thus, there is an urgent need to develop more effective agent(s) for the treatment and management of liver cancer.

3. Need of the hour:
The urgent need for safer, more effective treatments for Hepatocellular Carcinoma (HCC) is critical due to the high mortality and severe side effects of current therapies.

4. Our solution: LBURGINAZE™, an engineered human arginase 1, is an effective anti-cancer biologic.

PATENT STATUS:

Applied

TRL STATUS: TRL3/4

LBURGINAZE

SPECIFICATIONS OF TECHNOLOGY:

1. **Fusion Protein Engineering**: LBURGINAZE is an engineered human arginase 1 involved in arginine deprivation and manages liver cancer effectively.

2. **Simple-n-cost effective production platform**: High yield clone (*P pastoris*) and simple production process

3. **Superior efficacy**: LBURGINAZE has potential against broad spectrum of arginine auxotrophic cancers.

4. **Protected intellectual property**: Indian and International patent filed.

5. **Made In India !!!**

NEURO-E™: Engineered Human Apolipoprotein E mimetic peptide for the Treatment of Stroke

1. Field: Stroke is the 2nd most common cause of mortality globally. Each year, approximately 15 million people worldwide suffer from stroke. Of these, five million do not survive, and another five million are left permanently disabled, creating a significant burden on families and communities..

2. Problem: Currently tissue plasminogen activator (tPA) is the only approved drug for stroke treatment. However, its clinical use has serious limitations - ***a narrow therapeutic window*** of 3 - 4.5 h only and ***neurotoxic & cytotoxic effects***. Furthermore, tPA can only dissolve clots (thrombolysis) and cannot heal or protect the affected tissues. Other medications used in stroke management are primarily supportive (e.g., blood thinners, anti-hypertensive agents) and serve mainly to reduce the risk of further stroke rather than address the immediate damage. Therefore, there is an urgent need to develop new agent(s) for the treatment and management of stroke.

3. Need of the hour: The urgent need for safer, more effective treatments for stroke is critical due to the high mortality and severe side effects of current therapies.

4. Our solution: NEURO-E™, an engineered human apolipoprotein E mimetic peptide addresses these challenges

PATENT STATUS:

Granted

TRL STATUS: TRL3/4

NEURO-E

SPECIFICATIONS OF TECHNOLOGY:

1.**Unique structural design** NEURO-E is specifically designed to contain both LDL-R binding domain and the lipid-binding domain of native human ApoE, making it a highly efficacious to cross the blood-brain barrier, target brain cells, and promote repair.

2.**Neuroprotective Properties:** By mimicking ApoE natural role, NEURO-E™ protects neurons from damage caused by ischemia, oxidative stress, and inflammation, which are major contributors to stroke injury.

3.**Enhanced Neural Repair:** NEURO-E™ supports synapse formation, axonal growth, and neurogenesis in the hippocampus, all essential for cognitive recovery and motor function post-stroke.

4. **Protected intellectual property**: Indian patent filed.

5. **Made In India !!!**

Developmental stages of programs:

	Engineering	Lab scale production	Animal Studies (PoC)	Improvement	Tech. Transfer	Pre-clinical data for IND filing
BiSpekDAb™						
Neuro-E™						
LBUPON™						
LBURGINAZE™						
NGOBLOKER™						

1. ***BISPEKDAB / POLYBODIES*** (Granted, TM # 5572164 /6168239; WIPO Int Appl # 1786205).
2. ***LBUPON*** (Granted, TM # 5572163).
3. ***APOEFRAG / NEURO-E*** (Granted, TM# 5572165 / Application # 6168240).
4. ***LBURGINAZE*** (Granted, TM # 5572162).
5. ***NGOBLOKER*** (Application # 6168238)

Sequence Submission to GenBank:

>70 sequences of engineered proteins are submitted to GenBank (https://www.ncbi.nlm.nih.gov/nuccore/?term=pande+ah)

Patents:

1. ***Abhay H. Pande***, *Priyanka Bajaj, Rajan K. Tripathy, Geetika Agrawal*. Recombinant human paraoxonase 1 enzymes, method of generation and uses thereof. (**Indian Patent no. 334103**).
2. ***Abhay H. Pande***, *Priyanka Bajaj, Rajan K. Tripathy, Geetika Agrawal*. Recombinant human paraoxonase 1 enzymes, method of generation and uses thereof. (**WO 2014/115084 A2**).
3. ***Abhay H Pande***, *Sunil A. Nankar*. Anti-inflammatory peptides. (**Indian Patent no. 327385**).
4. ***Abhay H. Pande***, *Priyanka Bajaj, Rajan K. Tripathy, Ankita Jadhav Gaurav S. Chandak, Harsh D. Parikh*. Recombinant and stable SsoPox enzymes, method of generation thereof and reusable nanobiocatalyst of the same. (**Indian Patent no. 361919**).
5. ***Abhay H. Pande***, *Priyanka Bajaj, Rajan K. Tripathy, Ankita Jadhav Gaurav S. Chandak, Harsh D. Parikh*. Recombinant and stable SsoPox enzymes, method of generation thereof and reusable nanobiocatalyst of the same. (**WO 2015/145222 A2**).
6. ***Abhay H. Pande***, *Dharam Pal, Rajan K. Tripathy, Madaka Surya Teja, Prakashkumar B. Dobariya, Mukesh Kumar, Uttam C. Banerjee*. A novel polynucleotide encoding rhIFN-β polypeptide and a method of production of said polypeptide. (Indian Patent application # **201711008247**).
7. ***Abhay H. Pande***, *Priyanka Bajaj, Rajan K. Tripathy, Ankita Jadhav Gaurav S. Chandak, Harsh D. Parikh*. SOPOX-immobilized magnetic nanobiocatalys (**Indian Patent no. 532074**).
8. *Snehal Jawalkar, Kulbhushan Tikoo* ***Abhay H. Pande.*** Engineered arginase constructs, method of generation and uses thereof. (Indian Patent application # **202111011642**).
9. *Prakashkumar Dobariya, Shyam S. Sharma* ***Abhay H. Pande***. Engineered paraoxonase constructs, method of generation and uses thereof. (Indian Patent application # **202111015045**).
10. **Abhay Hariram Pande**, Snehal Sainath Jawalekar, Priyanka Sugriv Kawathe, Nisha Sharma, Kulbhushan Tikoo. Engineered arginase, method of generation and uses thereof (Indian Patent application **# 202211013970**).
11. *Snehal Jawalkar, Kulbhushan Tikoo* ***Abhay H. Pande***. Engineered arginase constructs method of generation and uses thereof. (**PCT/IN2022/050258**).
12. **Abhay Hariram Pande**, Suraj Hanumant Shinde, Prakashkumar B. Dobariya, Sandeep. Tumour necrosis factor alpha-neutralizing domain antibody and method of generation thereof (Indian Patent application **# 202211075699**).

13. **Abhay Hariram Pande**, Sakeel Ahmad, Rajan K. Tripathy, Shyam Sunder Sharma. ANTI-INFLAMMATORY PEPTIDES (Indian Patent application # **202311067164)**.
14. **Abhay Hariram Pande**, Prakash Khandave. Organophosphate neutralizing polypeptides, method of generation and uses thereof (Indian Patent application # **202311067354**).
15. **Abhay Hariram Pande**, Suraj Hanumant Shinde, Prakashkumar B. Dobariya, Sandeep. Tumour necrosis factor alpha-neutralizing domain antibody and method of generation thereof (**PCT/IB2023/063215**)
16. **Abhay Hariram Pande**, Suraj Hanumant Shinde, Sandeep. Polyvalent tumour necrosis factor-alpha blocking domain antibodies and method of generation thereof (Indian Patent application # **202411012808**).
17. Sandeep, Suraj Hanumant Shinde, Prakashkumar B. Dobariya, Priyanka S. Kawathe, Sakeel Ahmed, Bhupesh Vaidya, Chirag Gala, Shyam Sunder Sharma, **Abhay Hariram Pande**. Bispecific domain antibody (BiSpekDAb) and method of generation thereof (Indian Patent Application **#202411059121**).
18. **Abhay Hariram Pande**, Anakha J, Yenisetti Rajendra Prasad. 'Angiostatic agents, method of generation and uses thereof' (Indian Patent application # **202411078622**)

Papers/Reviews

Google scholar – Citations =1350; h-index = **20**; i_{10}-index =**38** (as on 21.11.24)

80. Anakha J, Prasad, YR, **Pande AH**. Endostatin in Disease Modulation: From Cancer to Beyond. **Vasc. Pharmacol.** (Under Revision)
79. Sandeep, Shinde SH, **Pande AH**. Antigen Specificity: A Fluctuating Aspect in the Development of Clinical Antibodies? **APMIS** (Under Revision)
78. **Pande AH**, Sandeep, Shinde SH. PolyBodies: Next Generation of Clinical Antibodies. **Drug Discov Today,** Oct, 104198. https://doi.org/10.1016/j.drudis.2024.104198 **[IF= 6.5]**
77. Khandave PY, Goyal K, Dobariya P, **Pande AH**. Human Paraoxonase 1: From Bloodstream Enzyme to Disease Fighter & Therapeutic Intervention. **Curr. Protein Pept. Sci**. (in press) **[IF= 1.9]**
76. Tripathy RK, Khandave PY, Bzdrenga J, Nachon F, Brazzolotto X, **Pande AH**. Role of paraoxonase 1 in organophosphate G-series nerve agent poisoning and future therapeutic strategies. **Arch Toxicol.** https://doi.org/10.1007/s00204-024-03884-2 **[IF= 4.8]**
75. Prasad YR, Anakha J, Jawalekar SS, **Pande AH**. Broad-spectrum anti-cancer activity of fused human arginase variants. **Invest New Drugs.** https://doi.org/10.1007/s10637-024-01466-8 **[IF= 3.0]**
74. Iyengar AR, Khandave PY, Bzdrenga J, Nachon F, Brazzolotto X, **Pande AH** (2024) Warfare Nerve Agents and Paraoxonase-1 as Potential Prophylactic Therapy Against Intoxication. **Protein Pept. Lett**. (10.2174/0109298665284293240409045359) **[IF= 1.0]**
73. Tripathy RK, **Pande AH** (2024) Molecular and functional insight into Anti-EGFR nanobody: Theranostic implications for malignancies. **Life Sciences**. May, 345: 122593 **[IF= 5.2]**
72. Prasad YR, J Anakha, **Pande AH** (2024). Treating liver cancer though arginine depletion. **Drug Discov Today**. April, 29 (4): 103940 **[IF= 6.5]**
71. Tripathy RK, Anakha J, **Pande AH** (2024) Towards development of Biobetter: L-asparaginase a case study. **Biochimica Biophysica Acta**. Jan, 1868, 130499-130513. **[IF= 2.8]**
70. Shinde SH, Sandeep, **Pande AH** (2024) Polyvalency - an emerging trend in the development of clinical antibodies **Drug Discov Today,** Jan 29(1):103846 **[IF= 6.5]**
69. J Anakha, Dobariya P, Sharma SS, **Pande AH** (2023) Potential of Recombinant Human Endostatin in Cancer Treatment: Therapeutic Perspective and Current status. **Medical Oncology**. Dec, 41:24 **[IF= 2.8]**
68. Sandeep, Shinde SH, Ahmed S, Sharma SS, **Pande AH** (2023) Engineered polyspecific antibodies: A new frontier in the field of immunotherapeutics. **Immunology**, Dec, 171:464–496. **[IF= 5.7]**

67. Jawalekar SS, Kawathe P, Sharma N, Anakha J, Tikoo KB, **Pande AH** (2023) Generation and characterization of engineered human arginase 1. **Invest New Drugs.** Oct 41(5):652-663 **[IF= 3.0]**
66. Anakha J, Yenisetti RP, Sharma N, **Pande AH** (2023). Human Arginase I: A Potential Broad-spectrum Anti-Cancer Agent. **3 Biotech**. May, (5):159. **[IF= 2.6]**
65. Dobariya P, Adhya P, Vaidya B, Khandave P, Sharma SS, **Pande AH** (2023)Fused Human Paraoxonase 1 as a Prophylactic agent against Organophosphate Poisoning. **Enzyme Microb. Technol**. April, 165, 110209 - 110 **[IF= 3.4]**
64. Sandeep, Shinde SH, **Pande AH** (2023) Polyspecificity - an emerging trend in the development of clinical antibodies. **Molecular Immunology.** March, 155; 175-183. **[IF= 3.2]**
63. Susrutha MJ, Khan S., Branham SK and **Pande AH** (2022) MATERIALS USED IN WOUNDDRESSINGS FOR MILD TOMODERATELY EXUDING WOUNDS: ARE VIEW. **International J. Health Technology.** 1(2):43-49. **[IF= NA]**
62. Sharma VK, Dobariya PK, Kawathe PS, **Pande AH**, Kalia R, Singh M, Jachak SM, Bharatam PV (2022) Pharmacoinformatics Studies to Identify Potential Inhibitors of Key SARS-CoV2 Enzymes among the Phytochemicals from Murrayakoenigii and Vitexnegundo. **CRIPS 17(4) 78-90**.
61. Ghosh S., Rihan M, Ahmed S, **Pande AH,** Sharma SS (**2022**) Immunomodulatory potential of apolipoproteins and their mimetic peptides in asthma: Current Perspective. **Respir. Med.** Nov 204:107007 **[IF= 3.5]**
60. Anakha J, Kawathe PS, Datta S, Jawalekar SS, Banerjee UC, **Pande AH** (**2022**) Human Arginase 1, a Jack of All Trade? **3 Biotech**. Sep, 12(10):264 **[IF= 2.6]**
59. Nankar SA, Ahmed S, Sharma SS, **Pande AH** (2022) Apolipoprotein-mimetic Peptides: Current and Future Prospectives. **Curr. Protein Pept. Sci**. Oct, 2022;23(11):757-772 **[IF= 1.9]**
58. Srineela B, Khan S, Branham SK, **Pande AH** (2022) A review on continuous glucose monitoring (CGM): Perspectives on glucose biosensors. **International J. Health Technology.** Aug, 1(2):43-49. **[IF= NA]**
57. Yadav B, Kandisa RV, Chekuri DK, **Pande A** (2022) Design and developing a device for migraine treatment: A review. **International J. Health Technology**. Aug,1(2):13-18. **[IF= NA]**
56. Ahmed S, **Pande AH**, Sharma SS (**2022**) Therapeutic potential of ApoE-mimetic peptides in CNS disorders: Current perspective. **Exp. Neurol**. Jul, 353, 114051 **[IF= 4.6]**
55. Nankar SA, Kawathe PS and **Pande AH** (**2022**) HDL, ApoA-I and ApoE-Mimetic Peptides: Potential Broad Spectrum Agent for Clinical Use? **Int. J. Pept. Res. Ther**. Jan, 28, 52. **[IF= 2.0]**
54. Pal D, Patel G, Dobariya P, Nile SH, **Pande AH**, Banerjee UC (**2021**) Optimization of medium composition to increase the expression of recombinant human interferon-β using the Plackett-Burman and central composite design in E. coli SE1. **3 Biotech**. May, 11(5):226. **[IF= 2.6]**
53. Datta S, Kawathe P, Jawalekar S and **Pande AH (2020)** Human Arginase I (Arg I) - A Potential Broad-spectrum Anti-cancer Agent: Perspectives and the Road Ahead. Research & Reviews: **Journal of Oncology and Hematology**. 9(3): 23–35. **[IF= NA]**
52. Nankar SA, Bulani Y, Sharma, SS and **Pande AH** (**2020**) ApoE-derived peptides attenuated diabetes-induced oxidative stress and inflammation. **Protein Pept. Lett**. Aug 27(3):193-200. **[IF= 1.0]**
51. Iyengar, AR, Gupta, S., Jawalekar, S. and Pande, AH (**2019**) Protein chimerization: A new frontier for engineering protein therapeutics with improved pharmacokinetics. **J. Pharmacol. Exp. Ther.** April, 370, 703-714. **[IF= 4.4]**
50. Iyengar AR, Pande AH (**2019**) Is human Paraoxonase 1 the saviour against the persistent threat of Organophosphorus nerve agents? **Protein Pept. Lett.** 26, 471-478. **[IF= 1.0]**
49. Dharam Pal, Tripathy RK, Teja, MS, Kumar M, Banerjee UC and **Pande AH** (**2018**) Antibiotic-free expression system for the production of human interferon-beta protein. **3 Biotech.** Jan, 8, 36.**[IF= 2.6]**
48. Tripathy RK, Aggarwal G, Bajaj P, Kathuria D, Bharatam PV and **Pande AH (2017)** Towards understanding the catalytic mechanism of human paraoxonase 1: mutagenesis and in silico studies. **Appl. Biochem. Biotechnol.** Aug, 182, 1642-1662.**[IF= 3.1]**

47. Iyengar SAR and **Pande AH** (**2016**) Organophosphate-hydrolyzing enzymes as first-line of defence against nerve agent-poisoning: Perspectives and the road ahead. **Protein J.** Dec, 35, 424-439. **[IF= 4.0]**
46. DharamPal, Teja MS, Iyengar Satvik AR and **Pande AH (2016)** Recombinant human interferon-β: Current perspectives. **W. Journ. Pharm. Pharm. Sci**. 5, 1567-1594. **[IF= NA]**
45. Bajaj P, Tripathy RK, Aggarwal G, Datusalia AK, Sharma SS and **Pande AH (2016)** Refolded recombinant human paraoxonase 1 variant exhibit prophylactic activity against organophosphate poisoning. **Appl. Biochem. Biotechnol.** Sep, 180; 165-176. **[IF= 3.1]**
44. Aggarwal G, Prajapati RB, Tripathy RK, Bajaj P, Iyengar Satvik AR, Sangamwar AT and **Pande AH** (**2016**) Towards understanding the catalytic mechanism of human paraoxonase 1: site-specific saturation mutagenesis at 192 position. **PLoS One.** Feb, 11(2):e0147999. **[IF= 2.9]**
43. Bajaj P, Tripathy RK, Aggarwal G and **Pande AH** (**2015**) Expression and purification of biologically active recombinant human paraoxonase 1 from inclusion bodies of Escherichia coli. **Protein Expr Purif.** Nov, 115, 95-101. **[IF= 2.0]**
42. Beladiya C, Tripathy RK, Bajaj P, Aggrawal G and **Pande AH** (**2015**) Expression, purification and immobilization of recombinant AiiA enzyme onto magnetic nanoparticles. **Protein Expr. Purif.** Sep, 113, 56-62. **[IF= 1.4]**
41. Iyengar Satvik AR, Tripathy RK, Bajaj P and **Pande AH** (**2015**) Improving storage stability of recombinant organophosphorus hydrolase. **Protein Expr. Purif.** July, 111, 28-35. **[IF= 1.4]**
40. Parikh H, Bajaj P, Tripathy RK, **Pande AH** (**2015**) Improving Properties of Recombinant SsoPox by Site-Specific Pegylation. **Protein Pept. Lett**. 22, 1098-1103. **[IF= 1.0]**
39. Bajaj P, Tripathy RK, Aggarwal G and **Pande AH** (**2014**) Paraoxonase 1 as a pharmacologic agent: Limitations and perspectives. **The Scientific World Journal**. Oct, 1. Vol: 2014. 2014. **[IF= 2.1]**
38. Bajaj P, Tripathy RK, Aggarwal G and **Pande AH** (**2014**) Interplay between amino acid residues at positions 192 and 115 in modulating hydrolytic activities of human paraoxonase 1. **Biochimie** Oct, 105, 202-210. **[IF= 3.3]**
37. Bajaj P and **Pande AH** (**2014**) Stabilization studies on bacterially produced human paraoxonase1 for improving its shelf life. **Appl. Biochem. Biotechnol.** Apr, 172, 3798-3809. **[IF= 3.1]**
36. Nankar SA, Seth C and **Pande AH** (**2014**) Apolipoprotein E derived peptides. **CRIPS** 15 (2), 26-33. **[IF= NA]**
35. Nankar SA and **Pande AH** (**2014**) Properties of apolipoprotein E derived peptide modulate their lipid-binding capacity and influence their anti-inflammatory function. **Biochim Biophys Acta.** Apr, 1841, 620-629. **[IF= 2.8]**
34. Nankar SA, Prajapati JS and **Pande AH** (**2014**) Apolipoprotein E derived peptides inhibit the pro-inflammatory effect of lysophosphatidylcholine. **Protein Pept.Lett.** Feb, 21, 101-107. **[IF= 1.0]**
33. Bajaj P, Tripathy RK, Aggarwal G and **Pande AH** (**2013**) Characterization of human paraoxonase 1 variants suggest that His residues at 115 and 134 positions are not always needed for the lactonase/arylesterase activities of the enzyme. **Protein Sci.** Dec, 22, 1799-1807. **[IF= 4.5]**
32. Kar S, Patel MA, Tripathy RK, Bajaj P and **Pande AH** (**2013**) Oxidized-phospholipids in reconstituted high density lipoprotein particles affect structure and function of recombinant paraoxonase 1. **Biochim. Biophys. Acta.** Dec, 1831, 1714-1720. **[IF= 2.8]**
31. Nankar SA and **Pande AH** (**2013**) Physicochemical properties of bacterial pro-inflammatory lipids influence their interaction with apolipoprotein-derived peptides. **Biochim. Biophys. Acta** Apr, 1831, 853-862. **[IF= 2.8]**
30. Nankar SA, Bajaj P, Sravanthi R and **Pande AH** (**2013**) Differential interaction of peptides derived from C-terminal domain of human apolipoprotein E with platelet activating factor analogs. **Biochimie** Jun, 95:1196-1207. **[IF= 3.3]**
29. Kar S, Bajaj P, Tripathy RK and **Pande AH** (**2013**) The chemical nature of the polar functional group of oxidized acyl chain uniquely modifies the physicochemical properties of oxidized phospholipid-containing lipid particles. **J. Membr. Biol.** Jun, 246, 443-452. **[IF= 2.3]**

28. Kar S, Patel MA, Tripathy RK, Bajaj P, Suvarnakar UV and **Pande AH** (**2012**) Oxidized phospholipid content destabilizes the structure of reconstituted high density lipoprotein particles and changes their function. **Biochim. Biophys. Acta.** Sep, 1821, 1200-1210. **[IF= 2.8]**
27. **Pande AH** and Tillu VA (**2011**) Membrane lipid composition differentially modulates the function of human plasma platelet activating factor-acetylhydrolase. **Biochim. Biophys. Acta** Jan, 1811, 46-56. **[IF= 2.8]**
26. Kar S, Tillu VA, Meena SC and **Pande AH** (**2011**) Closely related oxidized phospholipids differentially modulate the physicochemical properties of lipid particles. **Chem. Phys. Lipids** Jan, 164, 54-61. **[IF= 3.4]**
25. Taylor M, Banerjee T, Navarro-Garcia F, Huerta J, Massey S, Burlingame M, **Pande AH**, Tatulian, S.A. and Teter K (**2011**) A therapeutic chemical chaperone inhibits cholera intoxication and unfolding/translocation of the cholera toxin A1 subunit. **PLoS One**. Apr, 6:e18825. **[IF= 2.9]**
24. **Pande AH**, Kar S and Tripathy RK (**2010**) Oxidatively modified fatty acyl chain determines physicochemical properties of aggregates of oxidized phospholipids. **Biochim Biophys Acta**. Mar, 1798, 442-452. **[IF= 2.8]**
23. Banerjee T, **Pande A**, Jobling MG, Taylor MP, Massey S, Holmes RK, Tatulian SA and Teter K. (**2010**) Contribution of subdomain structure to the thermal stability of the cholera toxin A1 subunit. **Biochemistry** 49, Oct, 8839-8846. **[IF= 2.9]**
22. **Pande AH**, Tripathy RK and Nankar SA (**2009**) Membrane surface charge modulates lipoprotein complex forming capability of peptides derived from the C-terminal domain of apolipoprotein E. **Biochim. Biophys. Acta** Jun, 1788, 1366-1376. **[IF= 2.8]**
21. **Pande AH** and Tripathy RK. (**2009**) Preferential binding of apolipoprotein E derived peptides with oxidized phospholipid. **Biochem. Biophys. Res. Commun.** Feb, 380, 71-75. **[IF= 2.5]**
20. Limbachiya MS and **Pande AH** (**2009**) Peptide derived from the lipid binding domain of Group IB human pancreatic phospholipase A(2) possesses antibacterial activity. **Biochimie** Nov, 91, 1387-93. **[IF= 3.3]**
19. Massey S, Banerjee T, **Pande AH**, Taylor M, Tatulian SA and Teter K (**2009**) Stabilization of the tertiary structure of the cholera toxin A1 subunit inhibits toxin dislocation and cellular intoxication. **J. Mol. Biol**. Nov, 393, 1083-1096. **[IF= 4.7]**
18. **Pande AH**, Scaglione P, Taylor M, Nemec KN, Tuthill S, Moe D, Holmes RK, Tatulian SA and Teter K (**2007**) Conformational instability of the cholera toxin A1 polypeptide. **J. Mol. Biol**. Dec, 374, 1114-1128. **[IF= 4.7]**
17. **Pande AH**, Moe D, Jamnadas M, Tatulian SA and Teter K (**2006**) The pertussis toxin S1 subunit is a thermally unstable protein susceptible to degradation by the 20S proteasome. **Biochemistry.** Nov,45, 13734-13740. **[IF= 2.9]**
16. **Pande AH,** Qin S, Nemec KN, He X and Tatulian SA (**2006**) Isoform-specific membrane insertion of secretory phospholipase A2 and functional implications. **Biochemistry** Oct, 45, 12436-12447. **[IF= 2.9]**
15. Gupta RK, **Pande AH**, Gulla KC, Gabius HJ and Hajela K (**2006**) Carbohydrate-induced modulation of cell membrane. VIII. Agglutination with mammalian lectin galectin-1 increases osmofragility and membrane fluidity of trypsinized erythrocytes. **FEBS Lett**. Mar, 580, 1691-1695. **[IF= 3.0]**
14. Nemec KN, **Pande AH**, Qin S, Bieber Urbauer RJ, Tan S, Moe D and Tatulian SA (**2006**) Structural and functional effects of tryptophans inserted into the membrane-binding and substrate-binding sites of human group IIA phospholipase A2. **Biochemistry** Oct, 45, 12448-12460. **[IF= 2.9]**
13. **Pande AH**, Qin S and Tatulian SA (**2005**) Membrane fluidity is a key modulator of membrane binding, insertion, and activity of 5-lipoxygenase. **Biophys J**. Jun 88, 4084-4094.**[IF= 3.2]**
12. Qin S, **Pande AH,** Nemec KN, He X and Tatulian SA (**2005**) Evidence for the regulatory role of the N-terminal helix of secretory phospholipase A(2) from studies on native and chimeric proteins. **J. Biol. Chem**. Nov, 280, 36773-83. **[IF= 4.8]**
11. Tatulian SA, Qin S, **Pande AH** and He X (**2005**) Positioning membrane proteins by novel protein engineering and biophysical approaches. **J. Mol. Biol.** Nov, 351, 939-947. **[IF= 4.7]**

10. **Pande AH**, Moe D, Nemec KN, Qin S, Tan S and Tatulian SA (**2004**) Modulation of human 5-lipoxygenase activity by membrane lipids. **Biochemistry** Nov, 43, 14653-14666. **[IF= 2.9]**
9. Qin S, **Pande AH**, Nemec KN and Tatulian SA (**2004**) The N-terminal α-helix of pancreatic phospholipase A2 determines productive-mode orientation of the enzyme at the membrane surface. **J. Mol. Biol.** Nov, 344, 71–89. **[IF= 4.7]**
8. **Pande AH**, Gupta RK, Sumati and Hajela K (**2003**) Oxidation of goat hepatic galectin-1 induces changes in secondary structure. **Protein Pep. Lett.** Jun, 10, 265-275. **[IF= 1.0]**
7. Gupta RK, **Pande AH**, Sumati and Hajela K (**2003**) EPR studies on Fc-receptor mediated changes in lymphocyte membrane fluidity. **Ind. J. Biochem.Biophys**. Feb, 40, 59-61. **[IF= 1.5]**
6. Dhar J[¤], **Pande AH**[¤], Sundram V, Nanda JS, Mande SC and Sahni G (**2002**) Involvement of a nine-residue loop of streptokinase in the generation of macromolecular substrate specificity by the activator complex through interaction with substrate kringle domain. **J. Biol. Chem.** Apr, 277, 13257-13267. **[IF= 4.8]**
5. Hajela N, **Pande AH**, Sharma S, Rao DN and Hajela K (**1999**) Studies on a doubleheaded protease inhibitor from Phaseolus mungo. **J. Plant Biochem. Biotech**. 8, 57-60. **[IF= 1.6]**
4. **Pande AH**, Hajela N, Hajela K (1998) Biochemical characterization of a trypsin-chymotrypsin inhibitor from Vignaradiate. EAAP Publication 93 (1998): 47.
3. Hajela N, **Pande AH** and Hajela K (**1998**) Effect of inactivation of trypsin-chymotrypsin inhibitor of blackgram (Phaseolus mungo L.) by microwave heating as compared to traditional heating methods. **J. Food Sci. Tech**. 35 (4), 368-370. **[IF= 2.6]**
2. **Pande AH**, Sumati, Hajela N and Hajela K (**1998**) Carbohydrate induced modulation of cell membrane. VII. Binding of exogenous lectin increase osmofragility of erythrocytes. **FEBS Lett**. May, 427, 21-24. **[IF= 3.0]**
1. Hajela K, **Pande AH** and Sumati (**1997**) Carbohydrate induced modulation of cell membrane. VI. Binding of exogenous lectin induces susceptibility of erythrocytes to free radical damage: A spin label study. **FEBS Lett**. Apr, 406, 255-258. **[IF= 3.0]**

Book Chapter

1. Iyengar, A. S., Dobariya, P., &***Pande, A. H.***(2023). Paraoxonase 1 as a potential prophylactic against nerve agent poisoning. In Sensing of Deadly Toxic Chemical Warfare Agents, Nerve Agent Simulants, and their Toxicological Aspects (pp. 529-537). Elsevier (DoI: 10.1016/B978-0-323-90553-4.00006-8)
2. Sahni G, ***Pande AH***, Angrish AK. Catalyzing and accelerating a new phase in Indian BioPharma. In a book 'Biotechnology in India - Reworking A Strategy', Springer Nature https://doi.org/10.1007/978-981-97-0896-3_12.
3. Ahmed S., ***Pande AH***, Sharma SS. ApoE Potential in CNS Drugs Targeting and as CNS Therapeutic in "Targeted Therapy for Central Nervous System: Formulation, Clinical Challenges and Regulatory Strategies" (DoI:10.1016/B978-0-443-23841-3.00005-4)

Conference Abstracts

13. Bzdrenga J, Khandave P, Soirot T, Belverge N, Taudon N, Nachon F, Brazzolotto X, **Pande AH** (**2024**) Recombinant human paraoxonase-1 variants depict hydrolyzing capabilities of A-series nerve agents in vitro CHEPON 2024, 15th International Meeting on Cholinesterases, 9th International Conference on Paraoxonases, Brdo pri Kranju, Slovenia, 15-18 September, 2024
12. Bzdrenga J, Khandave PY, Nachon F, **Pande AH**, Brazzolotto X. (**2022**) Evaluation of recombinant human paraoxonase-1 for hydrolyzing capabilities of G-series nerve agents, an in vitro study. 14th International Meeting on Cholinesterases and the 8th International Conference on Paraoxonases (ChePon2022), Bologna, Italy.

11. *Shebuski RJ, Joshi K, **Pande A**, Sharma R, Prashar Y, Kapeghian J and Sahni, G.* (**2015**) Preclinical safety and efficacy of a novel thrombolytic agent administered by rapid bolus injection: Clot Specific Streptokinase (CSSK/SMRX-11). **Circulation** 132 (Suppl 3), A12419-A12419.
10. *Aggarwal G and **Pande AH*** (**2015**) Understanding the catalytic mechanism of Human serum paraoxonase 1- Combined mutagenesis and Molecular dynamics study. **FEBS J.** 282, 334-334.
9. *Kar S, Tripathy RK, Patel MA and **Pande AH***. (**2012**) Characterization of oxidized phospholipid containing reconstituted high density lipoprotein particle. **Biophys. J.** 102 (3), 494a.
8. *Nemec KN, **Pande AH**, Qin S, Tatulian, SR and Khaled AR* (**2009**) Bax C-terminal peptide-Insights into membrane interactions. **Biophys. J.** 96(3), 531a.
7. ***Pande AH**, Qin, S., Nemec, K.N. and Tatulian, S.A.* (**2007**) Real-time correlations between membrane binding mode, conformational changes, and activity of phospholipase A_2. **Biophys.J.** 338A-338A.
6. ***Pande AH**, Qin S and Tatulian SA* (**2005**) Membrane fluidity modulates interfacial activation of 5-lipoxygenase. **Biophys. J.** 88(1), 51A-51A.
5. ***Pande AH**, Nemec KN and Tatulian S.A.* (**2005**) Mechanism for enhanced activity of human group ha phospholipase A_2 upon V3W mutation. **Biophys. J.** 88(1), 427A-427A.
4. *Qin S, **Pande AH**, He XM and Tatulian SA* (**2004**) Exploring the mechanism of secretory phospholipase A2 by protein engineering and biophysical approaches**. FASEB J**. 18(8), C187-C187.
3. *Qin S, **Pande AH** and Tantulian SA* (2004) Positioning a peripheral protein at the membrane surface.**Biophys. J.** 86(1), 102A-102A.
2. *Moe D, **Pande AH**, Qin S, Tan SH and Tatulian S.A.* (**2004**) Mechanism of interfacial activation of 5-lipoxygenase. **Biophys. J.** 86(1), 255A-255A.
1. *Hajela K, **Pande AH** and Sumati* (**1997**) Crosslinking of erythrocytes by lectin enhances susceptibility to superoxide radical damage. **Eur J. Cell Biol.** 74, 37-37.

Honours / Awards / Recognition / Fellowship received:

9) **Honorary Fellow**, Association of Biotechnology and Pharmacy (ABAP), India
8) **Distinguished Researcher in Biopharmaceuticals,** Venus International Research Award-2024.
7) **Best Researcher Award**, International Academic Excellence Awards 2024
6) One of our Technologies (BiSpekDAb™ for Severe Asthma, defended by Sandeep) has won in the Grand Finale of "**National Bio Entrepreneurship Competition 2024 (NBEC 2024)**, BIRAC. Advance pre-clinical studies are going on.
5) One of our Technology has won in the Grand Finale of "**National Bio Entrepreneurship Competition 2022 (NBEC 2022)**, BIRAC. Advance pre-clinical studies are going on.
4) Visited to Shizuoka University, Japan (April, 2018) as a part of NIPER delegation for discussions on a memorandum of understanding (MOU).
3) **CSIR Technology Award for Life Sciences**: I was a part of the team receiving CSIR Technology Award for Life Sciences 2018 at Vigyan Bhavan on 26th Sep. 2018.
2) Humboldt Res Fellowship (2001) & The Wellcome Trust Fellowship (2003) [NOT availed]
1) CSIR Senior Research Fellowship: 1997-2000

Biotechnology Advocacy

Beyond my biopharmaceutical research, I am deeply committed to advocating for the vital role of Biotechnology in saving Biology. I believe biotechnology is crucial for addressing and mitigating the environmental impacts of human activity on mother Earth. It serves as a means to "save biology" by preserving and restoring the delicate balance of Life on Earth through the integration of science and innovation. By ethically applying various fields (colors) of biotechnology, we can not only repair the damage already caused by humans but also strive for a more harmonious coexistence with our planet, ensuring its beauty and diversity for future generations. To promote this perspective, we are engaged in numerous invited lectures/talks and published articles in esteemed magazines, emphasizing that biotechnology holds the key to addressing environmental challenges and mitigating the impact of human activities. By highlighting the transformative potential of biotechnology, we aim to inspire a greater appreciation for its role in preserving our planet and advancing human health.

8. **Pande AH**, Anakha J, Prasad YR, Angarish AK. Bharat, Bioeconomy and Biopharmaceuticals. (Communicated)
7. **Pande AH**, Anakha J. Brown Biotechnology – A Science for Sustainable Landmass Utilization and Conservation. (Communicated)
6. Pande AH, Prasad YR, Anakha J. What are Biopharmaceuticals? **Explor Drug Sci.** (in press)
5. **Pande AH**, Prasad YR, Anakha J and Angrish AK. (2024). India's bio-economy's quest to be the global eco-system. **Fortune India.** (https://www.fortuneindia.com/macro/indias-bio-economys-quest-to-be-the-global-eco-system/118662)
4. **Pande AH**, Anakha J. (2024). The Impact of RED Biotechnology on Healthcare Advances. **The Science World.** 4(9), 3749-3757. https://doi.org/10.5281/zenodo.13906501
3. **Pande AH**, Anakha J (2024) Saving Biology with Blue Biotechnology. **The Maritime Executive**. https://www.maritime-executive.com/article/saving-biology-with-blue-biotechnology
2. **Pande AH**, Anakha J (2024) DARK biotechnology-an emerging solution to CBRN emergencies. **The Defence Horizon Journal** Feb. DoI - 10.5281/zenodo.10701826
1. **Pande AH**, Anakha J. (2024) Biotech offers bright new future for the planet. **Innovators Magazine** (https://www.innovatorsmag.com/biotech-offers-colourful-new-antidote-to-human-greed/)