Dr. Mahesh D. Patil

Mob: +91-9766012203,
E-mail: mahesh.patil@ciab.res.in; mahi1709@gmail.com
ORCID: https://orcid.org/0000-0002-5602-3442
Scopus Author ID: 57188588655
Google scholar:
https://scholar.google.co.kr/citations?user=n0QqwH4AAAAJ&hl=en

RESEARCH INTERESTS

- ✓ Biocatalysis and Biotransformations
- ✓ Bioprocess Engineering and Downstream processing
- ✓ Protein Engineering

PROFESSIONAL EXPERIENCE

- ✓ **1st Oct. 2021**-Till date: DBT-M. K. Bhan Young Researcher at Center of Innovative and Applied Bioprocessing (CIAB), Mohali
- ✓ **15th March 2020-15th Sept. 2021**: Assistant Manager (R& D), POPL Pvt. Ltd.
- ✓ **1st March 2018- 29th Feb. 2020**: KU-Brain Pool Assistant Professor, Department of Bioscience and Biotechnology, Konkuk University, Seoul, South Korea
- ✓ **1st Sept. 2017- 28th Feb. 2018**: Postdoctoral Fellow, Protein Engineering Laboratory, Konkuk University, Seoul, South Korea (with Prof. Hyungdon Yun)

EDUCATIONAL QUALIFICATIONS

Sr. No.	Year	Description	Subject	Board/University
1.	July 2017	Ph.D	Pharmaceutical Technology (Biotechnology)	NIPER, Mohali
2.	2012	M. Tech (Pharm.)	Pharmaceutical Technology (Biotechnology)	NIPER, Mohali
3.	2010	B. Pharmacy	Pharmaceutical Sciences	University of Pune

NIPER: National Institute of Pharmaceutical Education and Research, Mohali

PhD Dissertation: Production, Purification and Characterization of Arginine Deiminase from *Pseudomonas putida*
Mentor: Prof. U. C. Banerjee

EDITORIAL ACTIVITIES

- ✓ Served as a Guest Editor for the Special Issue '**Catalyzed Synthesis of Chiral Amines**' of ***Catalysts*** journal (https://www.mdpi.com/journal/catalysts/special_issues/chiral_amines)

- ✓ Serving as a reviewer of *ACS Catalysis*, *Green Chemistry*, *ChemCatChem*, *Bioresource Technology*, and several other international peer reviewed journals.

PEER-REVIEWED PUBLICATIONS (as on 10th Feb. 2023)

Publication Summary

Total number of peer-reviewed international publications	:	39
Total Impact Factor	:	>323
Citations (as on 10th Feb. 2023)	:	> 1030
h-index	:	17
i10 index	:	27

(Google Scholar profile: https://scholar.google.com/citations?user=n0QqwH4AAAAJ&hl=en)

List of publications (In reversed chronological order)

39. Hyunwoo Jeon, Amol D Pagar, Hyeona Kang, Pritam Giri, Saravanan P Nadarajan, Sharad Sarak, Taresh P Khobragade, Seonga Lim, **Mahesh D Patil**, Sun-Gu Lee, Hyungdon Yun, Creation of a (*R*)-β-Transaminase by Directed Evolution of d-Amino Acid Aminotransferase. ***ACS Catalysis*** 2022, 12, 13207-13214; DOI: 10.1021/acscatal.2c04221 (**IF-13.700**)

38. Sharad Sarak, Amol D Pagar, Taresh P Khobragade, Hyunwoo Jeon, Pritam Giri, Seonga Lim, **Mahesh D Patil**, Ye Chan Kim, Byung-Gee Kim, Hyungdon Yun, Multienzyme Biocatalytic Cascade as a Route Towards Synthesis of α, ω-diamines from Corresponding Cycloalkanols. ***Green Chemistry*** 2023, 25, 543-549, In Press; DOI: 10.1039/D2GC03392E (**IF- 11.034**)

37. Hee-Wang Yoo, Hyunsang Jung, Sharad Sarak, Ye Chan Kim, Beom Gi Park, Byung-Gee Kim, **Mahesh D. Patil**, Hyungdon Yun, Multi-Enzymatic Cascade Reactions With *Escherichia Coli*-Based Modules For Synthesizing Various Bioplastic Monomers From Fatty Acid Methyl Esters. ***Green Chemistry*** 2022, 24, 2222-2231; DOI: 10.1039/D1GC04532F (**IF- 11.034**)

36. Pritam Giri[#] Amol D. Pagar,[#] **Mahesh D. Patil,** Hyungdon Yun, Chemical Modification of Enzymes to Improve Biocatalytic Performance. ***Biotechnology Advances*** 2021, 53, 107868; DOI: 10.1016/j.biotechadv.2021.107868 (**IF-17.681**) [#] Equal contribution

35. Taresh P Khobragade, Seongseon Yu, Hyunsang Jung, **Mahesh D Patil**, Sharad Sarak, …, Hyungdon Yun, Promoter Engineering-mediated Tuning of Esterase and Transaminase Expression for the Chemoenzymatic Synthesis of Sitagliptin Phosphate at the kilogram-scale, ***Biotechnology and Bioengineering*** 2021, 118, 3263-3268; DOI: 10.1002/bit.27819 (**IF-4.395**)

34. **Mahesh D. Patil**,[#] Amol D. Pagar,[#] Dillon T. Flood, Tae Hyeon Yoo, Philip E. Dawson, Hyungdon Yun, Recent Advances in Biocatalysis with Chemical Modification and Expanded Amino Acids Alphabet, ***Chemical Reviews*** 2021, 121, 6173-6245; DOI: 10.1021/acs.chemrev.0c01201 (**IF-72.087**) [#] Equal contribution

33. Gopal Patel, **Mahesh D Patil**, Sujit Tangadpalliwar, Shivraj Hariram Nile, Prabha Garg, Guoyin

Kai, Uttam Chand Banerjee, Machine Learning Modeling for Ultrasonication-Mediated Fermentation of *Penicillium brevicompactum* to Enhance the Release of Mycophenolic Acid, ***Ultrasound in Medicine & Biology*** 2021, 47, 777-786; DOI: 10.1016/j.ultrasmedbio.2020.11.018 (**IF-3.694**)

32. Sharad Sarak, Sihyong Sung, Hyunwoo Jeon, **Mahesh D Patil**, Taresh P Khobragade, Amol D Pagar, Philip E Dawson, Hyungdon Yun, An Integrated Cofactor/Co-Product Recycling Cascade for the Biosynthesis of Nylon Monomers from Cycloalkylamines, ***Angewandte Chemie International Edition*** 2020, 60, 3481-3486; DOI: 10.1002/anie.202012658 (**IF-16.823**)

31. Sharad Sarak, Hyunwoo Jeon, **Mahesh D Patil**, Taresh P Khobragade, Amol D Pagar, Sihyong Sung, Hee-Wang Yoo, Byung-Gee Kim, Sung Ho Yoon, Hyungdon Yun, Enzymatic Synthesis of Aliphatic Primary ω-Amino Alcohols from ω-Amino Fatty Acids by Carboxylic Acid Reductase, ***Catalysis Letters*** 2020, 150, 3079-3085; DOI: 10.1007/s10562-020-03233-9 (**IF-2.936**)

30. Gopal Patel, Taresh P Khobragade, Sachin R Avaghade, **Mahesh D Patil**, Shivraj Hariram Nile, Guoyin Kai, Uttam Chand Banerjee, Optimization of media and culture conditions for the production of tacrolimus by *Streptomyces tsukubaensis* in shake flask and fermenter level, ***Biocatalysis and Agricultural Biotechnology*** 2020, 29, 101803; DOI: 10.1016/j.bcab.2020.101803 (**Cite Score -6.2**)

29. Gopal Patel, Neeraj Singh Thakur, Varun Kushwah, **Mahesh D Patil**, Shivraj Hariram Nile, Sanyog Jain, Uttam Chand Banerjee, Guoyin Kai, Liposomal delivery of mycophenolic acid with quercetin for improved breast cancer therapy in SD rats, ***Frontiers in Bioengineering and Biotechnology*** 2020, 8, Article 631; DOI: 10.3389/fbioe.2020.00631 (**IF- 6.064)**

28. Gopal Patel, Neeraj Singh Thakur, Varun Kushwah, **Mahesh D Patil**, Shivraj Hariram Nile, Sanyog Jain, Guoyin Kai, Uttam Chand Banerjee, Mycophenolate co-administration with quercetin via lipid-polymer hybrid nanoparticles for enhanced breast cancer management, ***Nanomedicine: Nanotechnology, Biology and Medicine*** 2020, 24, 102147. DOI: 10.1016/j.nano.2019.102147 (**IF-6.458**)

27. Yumi Won, Hyunwoo Jeon, Amol D. Pagar, **Mahesh D. Patil**, Saravanan P. Nadarajan, Dillon T. Flood, Philip E. Dawson, Hyungdon Yun, *In Vivo* Biosynthesis of Tyrosine Analogs and Their Direct Incorporation in a Residue-Specific Manner For Enzyme Engineering, ***Chemical Communications*** 2019, 55, 15133-15136; DOI: 10.1039/C9CC08503C (**IF-6.065**)

26. Hee-Wang Yoo, Joonwon Kim, **Mahesh D Patil**, Beom Gi Park, Sung-yeon Joo, Hyungdon Yun, Byung-Gee Kim, Production of 12-Hydroxy Dodecanoic Acid Methyl Ester using a Signal Peptide Sequence-Optimized Transporter Alkl and a Novel Monooxygenase, ***Bioresource Technology*** 2019, 291, 121812; DOI: 10.1016/j.biortech.2019.121812 (**IF-11.889**).

25. **Mahesh D Patil**, Sanghan Yoon, Hyunwoo Jeon, Taresh P Khobragade, Sharad Sarak, Amol D Pagar, Yumi Won, Hyungdon Yun, Kinetic Resolution of Racemic Amines to Enantiopure (*S*)-amines by a Biocatalytic Cascade Employing Amine Dehydrogenase and Alanine Dehydrogenase, ***Catalysts*** 2019, 9, 600; DOI: 10.3390/catal9070600 (**IF-4.501**).

24. Kiran D Bhilare, **Mahesh D Patil**, Sujit Tangadpalliwar, Ashok Shinde, Prabha Garg, Uttam Chand Banerjee, Machine Learning Modelling for the Ultrasonication-Mediated Disruption of Recombinant *E. Coli* for the Efficient Release of Nitrilase, ***Ultrasonics*** 2019, 98, 72-81. DOI: 10.1016/j.ultras.2019.06.006 (**IF-4.062**).

23. **Mahesh D Patil**,[#] Sanghan Yoon,[#] Sharad Sarak, Hyunwoo Jeon, Geon-Hee Kim, Taresh P

Khobragade, Sihyong Sung, Hyungdon Yun, Deracemization of Racemic Amines to Enantiopure (*R*)-and (*S*)-amines by Biocatalytic Cascade Employing ω-Transaminase and Amine Dehydrogenase, ***ChemCatChem*** 2019, 11, 1437-1440; DOI: 10.1002/cctc.201900080 (**IF-5.501**); [#]Equal authorship

22. Geon-Hee Kim, Hyunwoo Jeon, Taresh P Khobragade, **Mahesh D Patil**, Sihyong Sung, Sanghan Yoon, Yumi Won, Sharad Sarak, Hyungdon Yun, Glutamate as an Efficient Amine Donor for the Synthesis of Chiral β-and γ-Amino Acids Using Transaminase, ***ChemCatChem*** 2019, 11, 1437-1440; DOI: 10.1002/cctc.201802048 (**IF-5.501**)

21. **Mahesh D. Patil**, Vijay P. Rathod, Umesh R. Bihade, Uttam Chand Banerjee, Purification and characterization of arginine deiminase from *Pseudomonas putida*: Structural insights of the differential affinities of L-arginine analogues, ***Journal of Bioscience and Bioengineering*** 2019, 127, 129-137; DOI: 10.1016/j.jbiosc.2018.07.021 (**IF-3.185**)

20. Yumi Won, Amol D Pagar, **Mahesh D Patil**, Philip E Dawson, Hyungdon Yun, Recent Advances in Enzyme Engineering through Incorporation of Unnatural Amino Acids, ***Biotechnology and Bioprocess Engineering*** 2019, 24, 592-604; DOI: 10.1007/s12257-019-0163-x (**IF-3.386**)

19. Geon-Hee Kim, Hyunwoo Jeon, Taresh P. Khobragade, **Mahesh D Patil**, Sihyong Sung, Sanghan Yoon, Yumi Won, In Suk Choi, Hyungdon Yun, Enzymatic synthesis of sitagliptin intermediate using a novel ω-transaminase, ***Enzyme and Microbial Technology*** 2019, 120, 52-60; DOI: 10.1016/j.enzmictec.2018.10.003 (**IF-3.705**)

18. Gopal Patel, Kush Biswas, **Mahesh D. Patil**, Yusuf Chisti, Uttam Chand Banerjee, Bioreactor studies of production of mycophenolic acid by *Penicillium brevicompactum*, ***Biochemical Engineering Journal*** 2018, 140, 77-84; DOI: 10.1016/j.bej.2018.09.007 (**IF-4.446**)

17. **Mahesh D. Patil**, Gideon Grogan, Hyungdon Yun, Biocatalyzed C−C Bond Formation for the Production of Alkaloids, ***ChemCatChem*** 2018, 10, 4783-4804; DOI: 10.1002/cctc.201801130 (**IF-5.501**)

16. **Mahesh D. Patil**, Gideon Grogan, Andreas S. Bommarius, Hyungdon Yun, Oxidoreductase-Catalyzed Synthesis of Chiral Amines, ***ACS Catalysis*** 2018, 8, 10985–11015; DOI: 10.1021/acscatal.8b02924 (**IF-13.700**)

15. Hyunwoo Jeon, Sharad Sarak, Sang-Hyuk Lee, Han-Seop Bea, **Mahesh D. Patil**, Geon-Hee Kim, Byung-Gee Kim, Jong In Won, Hyungdon Yun, Characterization of ELP-fused ω-Transaminase and Its Application for the Biosynthesis of β-Amino Acid, ***Biotechnology and Bioprocess Engineering*** 2018, 23, 481-489; DOI: 10.1007/s12257-018-0268-7 (**IF-3.386**)

14. **Mahesh D. Patil**, Ashok S. Shinde, Gopal Patel, Kiran D. Bhilare, Manoj J. Dev and Uttam Chand Banerjee, Combined Effect of Attrition and Ultrasound on the Disruption of *Pseudomonas putida* for the Efficient Release of Arginine Deiminase, ***Biotechnology Progress*** 2018, 34, 1185-1194; DOI: 10.1002/btpr.2664 (**IF-2.909**)

13. Md Ahsan, **Mahesh D. Patil**, Hyunwoo Jeon, Sihyong Sung, Taeowan Chung, Hyungdon Yun, Biosynthesis of Nylon 12 Monomer, ω-Aminododecanoic Acid Using Artificial Self-Sufficient P450, AlkJ and ω-TA, ***Catalysts*** 2018, 8, 400; DOI: 10.3390/catal8090400 (**IF-4.501**).

12. **Mahesh D. Patil**, Gideon Grogan, Andreas Bommarius and Hyungdon Yun, Recent Advances in ω-Transaminase-Mediated Biocatalysis for the Enantioselective Synthesis of Chiral Amines, ***Catalysts*** 2018, 8, 254; DOI: 10.3390/catal8070254 (**IF-4.501**).

11. Kiran D Bhilare, **Mahesh D. Patil**, Sujit Tangadpalliwar, Manoj J. Dev, Prabha Garg, and Uttam Chand Banerjee. Machine learning modelling for the high-pressure homogenization-mediated disruption of recombinant *E. coli*. ***Process Biochemistry*** 2018, 71, 182-190; DOI: 10.1016/j.procbio.2018.05.001 (**IF-4.885**).

10. Sihyong Sung, Hyunwoo Jeon, Sharad Sarak, Md Murshidul Ahsan, **Mahesh D. Patil**, Wolfgang Kroutil, Byung-Gee Kim, Hyungdon Yun, Parallel anti-sense two-step cascade for alcohol amination leading to ω-amino fatty acids and α,ω-diamines, ***Green Chemistry*** 2018, 20, 4591-4595; DOI: 10.1039/C8GC02122H (**IF-11.034**).

9. Md Murshidul Ahsan, Sihyong Sung, Hyunwoo Jeon, **Mahesh D. Patil**, Taeowan Chung, Hyungdon Yun. Biosynthesis of Medium-to Long-Chain α, ω-Diols from Free Fatty Acids Using CYP153A Monooxygenase, Carboxylic Acid Reductase, and *E. coli* Endogenous Aldehyde Reductases. ***Catalysts*** 2018, 8, 4; DOI: 10.3390/catal8010004 (**IF-4.501**).

8. Md. Murshidul Ahsan, Hyunwoo Jeon Saravanan P. Nadarajan, Taeowan Chung, Hee-Wang Yoo, Byung-Gee Kim, **Mahesh D. Patil**, and Hyungdon Yun, Biosynthesis of the nylon 12 monomer, ω-Aminododecanoic acid with novel CYP153A, AlkJ, and ω-TA enzymes, ***Biotechnology Journal*** 2017, 13, 1700562; DOI: 10.1002/biot.201700562 (**IF-5.7**).

7. **Mahesh D. Patil**, Manoj J. Dev, Sujit Tangadpalliwar, Gopal Patel, Prabha Garg, Yusuf Chisti, Uttam Chand Banerjee, Ultrasonic disruption of *Pseudomonas putida* for the release of arginine deiminase: Kinetics and predictive models, ***Bioresource Technology*** 2017, 233, 74–83. DOI: 10.1016/j.biortech.2017.02.074 (**IF-11.889**).

6. **Mahesh D. Patil**, Manoj J. Dev, Ashok Shinde, Kiran D. Bhilare, Gopal Patel, Yusuf Chisti, Uttam Chand Banerjee, Surfactant-mediated permeabilization of *Pseudomonas putida* and its immobilization for the biotransformation of L-arginine to L-citrulline, ***Process Biochemistry*** 2017, 63, 113-121. DOI: 10.1016/j.procbio.2017.08.002 (**IF-4.885**).

5. Gopal Patel, **Mahesh D. Patil**, Surbhi Soni, Yusuf Chisti, Uttam Chand Banerjee, Production of mycophenolic acid by *Penicillium brevicompactum* using solid state fermentation, ***Applied Biochemistry and Biotechnology*** 2017, 182, 97-109; DOI: 10.1007/s12010-016-2313-3 (**IF-3.094**).

4. **Mahesh D. Patil**, Jayeeta Bhaumik, Suboj Babykutty, Uttam Chand Banerjee, Dai Fukumura, Arginine dependence of tumor cells: targeting a chink in cancer's armor, ***Oncogene*** 2016, 35, 4957–4972; DOI: 10.1038/onc.2016.37 (**IF-9.273**).

3. **Mahesh D. Patil**, Kiran D. Shinde, Gopal Patel, Yusuf Chisti, Utaam Chand Banerjee, Use of response surface method for maximizing the production of arginine deiminase by *Pseudomonas putida*, ***Biotechnology Reports*** 2016, 10, 29–37. DOI: 10.1016/j.btre.2016.03.002 (**CiteScore- 8.0**)

2. **Mahesh D. Patil**, Gopal Patel, Balaji Surywanshi, Naeem Shaikh, Prabha Garg, Yusuf Chisti, Uttam Chand Banerjee, Disruption of *Pseudomonas putida* by high pressure homogenization: a comparison of the predictive capacity of three process models for the efficient release of arginine deiminase, ***AMB Express*** 2016, 6, 84. DOI: 10.1186/s13568-016-0260-6 (**IF-4.245**).

1. Gopal Patel, **Mahesh D. Patil**, Surbhi Soni, Taresh P. Khobragade, Yusuf Chisti, Uttam Chand Banerjee, Production of mycophenolic acid by *Penicillium brevicompactum*- A comparison of two methods of optimization, ***Biotechnology Reports*** 2016, 11, 77-85. DOI: 10.1016/j.btre.2016.07.003 (**CiteScore- 8.0**)

OTHER QUALIFICATIONS

Exam.	Conducting Agency	Year	Subject	Remark
CSIR-UGC- NET	CSIR	2012	Life Sciences	Qualified (AIR 42)
DBT-JRF-Program	DBT	2012	Biotechnology and Applied biology	Qualified (AIR 52)
GATE-2012	IIT, Delhi	2012	Biotechnology	Qualified (AIR 66)
GATE-2011	IIT, Madras	2011	Biotechnology	Qualified (AIR 1430)
GPAT-2010	AICTE	2010	Pharmaceutical Sciences	Qualified (AIR 519)
GATE-2009	IIT, Roorkee	2009	Pharmaceutical Sciences	Qualified (AIR 3215)

EXTRAMURAL FUNDING

- ✓ Serving as a **Principal Investigator** (as M. K. Bhan Young Researcher Fellow) for the project '*Valorization of Agricultural Fatty Acid Byproducts for the Biosynthesis of Industrially Important Bioplastic Monomers Using Multi-enzymatic Cascades*' funded by DBT, Government of India (Project cost- 89 Lakh) Oct. 2021- Sept. 2024.

- ✓ Served as a **Principal Investigator** for the project '*Development of Industrial Production Technology for Diabetic Drug Sitagliptin Using Enzyme Catalysts Technology*' funded by Ministry of Trade, Industry and Energy of South Korea (MOTIE, Korea) (Grant No. 10076343) (Project cost- ~USD 50,000 per annum)

PROFESSIONAL MEMBERSHIP & AWARDS

- ✓ Awarded with '**International Young Researcher Award 2020-21**' by International Institute of Organized Research (I_2OR)
- ✓ 2021: **M. K. Bhan Young Researcher Fellowship**, DBT, Government of India
- ✓ 2021: **Dr. D. S. Kothari Postdoctoral Fellowship**. University Grant Commission, Government of India (Thankfully declined).
- ✓ Awarded with '**KU-Brain pool Fellowship**' and served as 'Research Professor' at Konkuk University, Seoul, South Korea (March 2018- Feb 2020)
- ✓ Awarded with Senior Research Fellowship from DBT, Government of India (2014-2017)
- ✓ Awarded with Junior Research Fellowship from DBT, Government of India (2012-2014)
- ✓ Lifetime member of Biotech Research Society of India (BRSI) (Membership No: LM 2635)
- ✓ Member of American Chemical Society (ACS Member Number – 32946757)

- ✓ Lifetime member of International Society for Research and Development (Membership ID: SR4150900539
- ✓ Lifetime member of Asian Federation of Biotechnology (Membership ID: KR01137)

CONFERENCE/POSTER PRESENTATION/ WORKSHOPS/ORAL TALKS

1. Delivered an **oral talk** '**Biocatalytic Synthesis of Industrially Important Bioplastic Monomers using Multi-enzymatic Cascades**' at 8th International Bioprocessing India Conference, CSIR- National Chemical Laboratory, Pune (16-12-2022 to 18-12-2022)
2. Presented poster '**Modularization of the Biocatalytic Cascade for the Biosynthesis of Bioplastic Monomers**' at International Conference on Biotechnology for Sustainable Bioresources and Bioeconomy (BSBB-2022), IIT Guwahati (7-12-202 to 11-12-2022)
3. Attended '**2018-KSIEC (The Korean Society of Industrial and Engineering Chemistry) Fall meeting**', at ICC, Jeju, South Korea (31-10-2018 to 02-11-2018)
4. Hands-on-participation & training program on **"Basic mammalian cell culture, Cytotoxicity assays, Fluorescence microscopy & Flow cytometry techniques"** at Genelon Institute of Life Sciences, Bangalore, (5-12-2016 to 23-12-2016)
5. The '**Short Term Course on Advances in Industrial Biotechnology**', Organized by Department of Biotechnology, Dr. B. R. Ambedkar National Institute of Technology, Jalandhar, India (30-11-2015 to 04-12-2015).