Indian Society for the Study of Reproduction & Fertility (ISSRF)
Centre for Advanced Studies, Department of Zoology
University of Rajasthan, Jaipur – 302 004

Proforma for Dr. (Mrs.) Mridula Kamboj Young Scientist Awards

1. Name and designation: Dr. Apoorva Challa, Project Research Scientist-III
2. Date of birth: 27.05.1989 age: 35 years 5 months
3. Institutional/Postal address with e-mail and telephone, fax, mobile nos.

   Room No. 4070, 4th Floor, Teaching Block, Department of Dermatology and Venereology, All India Institute of Medical Sciences, New Delhi-110029

   Email: apoorvaid.9@gmail.com

   Telephone: +91 98186 78985
4. ISSRF membership no. 1791
5. Academic qualifications beginning with the Bachelor's degree

S. No.	Degree	Institution	Year
1	Bachelors of Sciences (Chemistry, Zoology, Microbiology)	Mount Carmel College, Bangalore University	2010
2	Masters of Science (Microbiology)	CMR Institute, Bangalore University	2012
3	Doctor of Philosophy	All India Institute of Medical Sciences, Delhi	2023

6. Field of specialization: Infectious diseases, omics, diagnostics, sexual and reproductive health

7. Details of employment and nature of duties in tabular form

S.No.	Designation	Institution /Organization	Duration
1	Project Scientist-II I	Department of Dermatology and Venereology, AIIMS, Delhi	November 2023-Present
2	Research Associate-I	Department of Geriatrics, AIIMS, Delhi	September 2023-October 2023
3	ICMR-Senior Research Fellow	Department of Dermatology and Venereology, AIIMS, Delhi	April 2019-March 2023
4	Senior Research Fellow	Department of Dermatology and Venereology, AIIMS, Delhi	May 2017-April 2019
5	Senior Research Fellow	Department of Dermatology and Venereology, AIIMS, Delhi	March 2016-May 2017

6	Editorial Intern	Indian Journal of Dermatology and Venereology	May 2015-March 2016
7	Laboratory Technician	Department of Dermatology and Venereology, AIIMS, Delhi	August 2013-April 2015

8. Summary of research work (not more than three pages):

My research interests lie at the intersection of infectious diseases diagnosis and sexual and reproductive health with a particular focus on women's health. Through my research, I aim to apply next generation methods to the understanding of infectious diseases and advance diagnostic technologies to common yet under-addressed health conditions in women. One of my primary research areas is bacterial vaginosis (BV), a condition commonly affecting women with significant implications for sexual and reproductive health. BV is not only a cause of vaginal discomfort and infection but is also linked to more severe health outcomes, such as increased susceptibility to sexually transmitted infections (STIs), fertility and pregnancy complications. A major component of my research involves leveraging cutting-edge technologies like artificial intelligence (AI) and machine learning (ML) to analyze complex datasets and improve diagnostic capabilities. Further, integrating microbial and metabolomic profiles using AI/ML tools my research has identified novel omics-based targets for BV. These tools can significantly enhance the accuracy, speed, and scalability of diagnostics for BV and other infectious diseases, making them particularly valuable for point-of-care settings. The use of AI/ML can also reduce the subjectivity involved in traditional diagnostic methods by providing accurate and data-driven results. This integration of AI and multi-omics approaches holds the potential to revolutionize the way we diagnose and treat STIs and RTIs, improving patient outcomes through rapid and precise diagnoses and treatments. These innovations have the potential to be accelerated to accessible and affordable tools of healthcare which can be particularly useful in underserved areas where traditional diagnostic methods may be expensive or impractical. Further my studies have aimed at identifying risk factors for this condition, especially in women from North India.

Beyond BV, my research also delves into the growing threat of antimicrobial resistance (AMR) in STIs, with a special focus on *Neisseria gonorrhoeae* and its resistance to azithromycin. AMR is a major public health challenge as it complicates treatment regimens and our continued fight against infectious diseases. Through my study on azithromycin resistance in *N. gonorrhoeae* isolates from a tertiary care centre in North India, I investigated the molecular characteristics of this resistance and its implications for clinical management. This research was aimed at understanding how resistance develops and spreads, providing insights into the mechanisms behind AMR in gonorrhea. An understanding of regional variations in resistance patterns can guide public health interventions and ensuring the availability of effective treatments, particularly in regions where AMR is emerging as a significant public health threat.

I aim to take my research beyond the confines of the lab. By advancing understanding of the epidemiology, molecular mechanisms and biomarkers of infectious diseases like BV and gonorrhea, my work aims to improve sexual and reproductive health outcomes on a broader scale. Early and accurate diagnosis of STIs/RTIs can help reduce the risks of complications associated with reproductive and pregnancy outcomes, ultimately improving the quality of life for women. In addition, addressing antimicrobial resistance in STIs prepares us to tackle the growing challenge of drug-resistance and monitor the effectiveness of current treatments. My research also emphasizes the need for interventions and diagnostics specific to our population, particularly in low-resource settings where access to healthcare may be limited. By focusing on affordable, scalable diagnostic solutions, I hope to contribute to more equitable healthcare access, particularly for women in underserved regions. In this context, my work has the potential to shape public health strategies, guide clinical practices, and inform policy decisions to reduce the burden of infectious diseases and improve overall health outcomes.

Ultimately, my research aims to bridge the gap between fundamental scientific discovery and its application in public health. By combining molecular epidemiology with technological advancements, my work seeks to provide actionable insights that can enhance the diagnosis, treatment, and prevention of infectious diseases, with a particular focus on sexual and reproductive health. This approach has significant implications for global health, especially in the context of rising antimicrobial resistance, the need for more accurate diagnostics, and the desire to improve women's health outcomes. Through a better understanding of the epidemiology of common infections and resistance patterns, we can develop more

effective interventions, ensure better-targeted treatments, and contribute to the overall improvement of public health.

9. A concise statement (about 200 words) highlighting the most significant aspects of the research contributions made that you would like to see in your citation of award, if chosen:

Dr. Apoorva Challa's research focuses on improving the diagnosis, treatment and management of reproductive tract infections (RTIs) and sexual transmitted infections (STIs), with a particular focus on women. Dr. Challa's research has addressed the epidemiology of BV in North India, highlighting the condition's high prevalence and underdiagnosis, particularly in resource-limited settings. She has used multi-omics strategies to understand vaginal dysbiosis in Indian women, with an aim to develop robust machine learning predictive models by integrating microbiomics and metabolomics. Her research has identified microbial and metabolic biomarkers that offer more accurate, non-invasive diagnostic tools with potential for point-of-care diagnosis compared to traditional methods. Overall, Dr. Challa's research aims to significantly improve women's health by developing better diagnostic tools, enhancing treatment strategies, and addressing public health challenges related to BV and AMR, especially in regions like India where these issues are increasingly prevalent.

10. List of publications (with impact factor):

S.No.	Publication	Year	Impact Factor
1	Challa A, Maras JS, Nagpal S, et al. Multi-omics analysis identifies potential microbial and metabolite diagnostic biomarkers of bacterial vaginosis. J Eur Acad Dermatol Venereol. 2024 Jan 29.	2024	9.2

2	Chauhan S, Challa A, Arava S.K. et al. Comparison of laboratory and clinical parameters of cold versus warm trypsinization methods of non-cultured epidermal cell suspension preparation in the treatment of stable vitiligo: a randomized trial. Arch Dermatol Res. 2024 Aug 31;316(8):592.	2024	1.8
3	Sharma A, Gupta V, Bhatia S, Upadhyay A, Challa A, Gupta S. Apremilast versus betamethasone oral mini-pulse in the treatment of progressive non-segmental vitiligo: A randomised pilot trial. Indian J Dermatol Venereol Leprol. 2024 Jul 26:1-5.	2024	3.2
4	Challa A, Sharma U, Tyagi R et al. Predictive Performance of 1 H-NMR Metabolomics-Derived Biomarkers of Bacterial Vaginosis. Sex Transm Dis. 2024 Feb 1;51(2):125-127.	2022	2.4
5	Challa A, Chauhan S, Pangti R, et al. Evaluation of clinical efficacy and laboratory indicators of non-cultured epidermal cell suspension and hair follicle	2022	2.3

	cell suspension in surgical management of stable vitiligo: A randomized comparative trial J Cosmet Dermatol. 2022 Sep 24.		
6	Challa A, Mahajan N, Sood S, et al. Azithromycin resistance and its molecular characteristics in Neisseria gonorrhoeae isolates from a tertiary care centre in North India. Indian J Med Microbiol. 2022 Jul-Sep;40(3):433- 435.	2022	2.1
7	Challa A, Kachhawa G, Sood S, et al. Correlates of bacterial vaginosis among women from North India. Int J STD AIDS. 2022 Jun;33(7):666-671.	2020	1.4
8	Challa A, Sood S, Kachhawa G, et al. Diagnostic concordance between Amsel's criteria and the Nugent scoring method in the assessment of bacterial vaginosis. Sex Health. 2022 Jan;18(6):512-514.	2021	1.8
9	Gunaabalaji DR, Pangti R, Challa A, et al. Comparison of efficacy of noncultured hair follicle cell suspension and noncultured epidermal cell suspension in repigmentation of leukotrichia and skin	2016	3.5

	patch in vitiligo: a randomized trial. Int J Dermatol. 2020 Nov;59(11):1393-1400.		
10	Pangti R, Challa A, Chauhan S, et al. Comparison of Cell Suspension Transplantation Prepared From Plucked Hair Shafts, Excised Hair Follicles, and Epidermal Shave Biopsies in Vitiligo Patients: A Randomized Study. Dermatol Surg. 2021 May 1;47(5):735-738.	2016	2.4
11	Marwaha RK, Yenamandra VK, Sreenivas V, et al. Regional and seasonal variations in ultraviolet B irradiation and vitamin D synthesis in India. Osteoporos Int. 2016 Apr;27(4):1611-1617.	2015	4.2
12	Sethuraman G, Marwaha RK, Challa A, et al. Vitamin D: A New Promising Therapy for Congenital Ichthyosis. Pediatrics. 2016 Jan;137(1).		8.0
13	Marwaha RK, Sreenivas V, Talwar D, et al. Impact of solar ultraviolet B radiation (290-320 nm) on vitamin D synthesis in children with type IV and V skin. Br J Dermatol. 2015 Aug;173(2):604-6.		10.0

11. Patents filed /obtained

12. Awards and other recognitions received:

S.No.	Award/Recognition	Year
1	**ICMR-DHR International Travel Grant** to attend the 25th IUSTI World Congress held in Sydney, Australia wherein as an invited speaker I delivered a talk on "Multi-omics signatures of bacterial vaginosis in Indian women and its clinical relevance"	2024
2	**Dr. V Govindan Nair Memorial Award (Silver Medal)** for oral presentation "Machine learning model for microbiome-based diagnosis of bacterial vaginosis in Indian women" at 46th National Conference of IASSTD & AIDS (ASTICON), Hyderabad, Telangana, India, September 9-11, 2022	2022
3	**First Prize for poster (UN-SDGs category)** "The intimate story: Causes, components and characteristics of vaginal dysbiosis" at Second Annual Research Day, All India Institute of Medical Sciences, New Delhi- October 18, 2022	2022

4	**Second Prize- Best Paper (PhD Category)** "Omics-based diagnostic markers of bacterial vaginosis in reproductive-age Indian women" on Second Annual Research Day, All India Institute of Medical Sciences, New Delhi- October 18, 2022	2022
5	**Keystone Symposia Registration Scholarship** for Keystone eSymposia, Global Priorities in Vaginal Health: Microbes, Mucosal Immunity and Interventions, November 10-12, 2021 e-Poster - Clinical diagnosis of bacterial vaginosis in a resource limited tertiary care setting	2021
6	**STI & HIV World Congress Scholarship** to present poster "Vaginal microbiome profiling in Indian women with and without bacterial vaginosis" to attend the virtual STI & HIV 2021 World Congress held between July 14-17, 2021	2022
7	**IUSTI - IASSTD & AIDS Scholarship** for oral presentation "Proton (1H) nuclear magnetic resonance (NMR) spectroscopy based metabolic profiling of vaginal fluid to identify discriminatory biomarker/s of bacterial vaginosis" at 43rd National Conference of IASSTD & AIDS (ASTICON), Kodaikanal, Tamil Nadu, India - October 11- 13, 2019	2019

8	**Bill and Melinda Gates Foundation Global Health Travel Award** for poster "Association between dysbiosis of the vaginal microbiota and bacterial infections" at Keystone Symposia Role of the Genital Tract Microbiome in Sexual and Reproductive Health, Cape Town, South Africa - December 11-15, 2018	2018

13. Any other information: I am a postdoctoral scientist deeply dedicated to advancing research in the field of female sexual and reproductive health. To enhance my expertise in this scientific area, I successfully completed an e-certificate course on STI & HIV /AIDS -Distance Learning (December 2017- June 2018) from the Public Health Foundation of India, Delhi. I actively pursue my passion for research and contribute to the scientific community by participating in various national and international conferences. In addition to my academic achievements, I have received institute-level awards for achievements in debate and photography.

14. I hereby declare that the above noted information is true and correct to the best of my knowledge and belief.

Date: 14.11.2024 Apoorva

Place: Delhi Signature of applicant

Nominated by: Dr. Somesh Gupta, Professor, Department of Dermatology and Venereology, All India Institute of Medical Sciences, New Delhi-110029