

DR. AISHWARYA GUHA

Assistant Professor of Biotechnology & Cancer Biology Researcher

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DOB: 01/05/1995

Nationality: Indian

Category: General



PROFESSIONAL SUMMARY

Breast cancer immunology researcher with extensive expertise in the tumor microenvironment, tumor-educated platelets, cancer stem cells, EMT, angiogenesis and translational oncology. Skilled in advanced molecular biology techniques, clinical and animal sample handling, high-resolution microscopy and diverse immunological assays. Proven track record in undergraduate (UG) and postgraduate (PG) level pedagogy and research mentorship. Published widely in high-impact international journals including Breast Cancer Research, Molecular Therapy: Oncology, Molecular Cancer Research, Cytokine and Frontiers in Immunology. Currently serving as Book Editor for an upcoming volume with Springer Nature (2026).

PRESENT AFFILIATION, ACADEMIC AND ADMINISTRATIVE EXPERIENCE

Assistant Professor, Department of Biotechnology

Jan 2026 – Present

Swami Vivekananda University, Barrackpore, West Bengal

Delivering core theory and practical training modules across specialized courses for advanced UG, PG and PhD programs:

- **PG Biotechnology (SEM II):** Recombinant DNA Technology (Theory & Practical)
- **PG Microbiology (SEM II):** Recombinant DNA Technology (Theory & Practical)
- **PG Microbiology (SEM II):** Genetics -Prokaryotic and Eukaryotic (Theory)
- **UG Biotechnology (SEM VI):** Animal Biotechnology (Theory)
- **UG Microbiology (SEM VI):** Animal Pathology (Theory)
- **UG Microbiology (SEM II):** Cell Biology (Practical)
- **UG Microbiology (SEM V):** Molecular Biology (Theory)
- **UG Biotechnology (SEM I):** Biochemistry and Metabolism (Practical)
- **UG Biotechnology (SEM I):** Developmental Biology (Theory)
- **UG Microbiology (SEM VII):** Microbial Diagnostics (Theory)
- **UG Biotechnology (SEM VII):** Molecular Diagnostics (Theory)
- **PhD Course Work (Biotechnology and Microbiology):** Cell and Molecular Biology, Cancer and Stem cell Biology, Immunology

Guest Lecturer (Postgraduate Section, Department of Zoology)

Oct 2024 – Nov 2024

Vivekananda College, University of Calcutta, Kolkata

Conducted dedicated postgraduate theory classes under the specialized Molecular Cell Biology elective stream.

EDUCATION

Ph.D. in Cancer Biology – Immunology

2020 – 2025

Department of Life Science & Biotechnology, Jadavpur University, Kolkata

Thesis: *Elucidating The Role of Tumor Educated Platelets in Promoting Epithelial to Mesenchymal Transition and Angiogenesis in Breast Cancer: Therapeutic Intervention by Aspirin*

M.Sc. in Zoology

(Specialization: Molecular & Cell Biology)

University of Calcutta, Department of Zoology |

2017 – 2019

Aggregate: 74.2%

B.Sc. (Honours) in Zoology

2014 – 2017

Lady Brabourne College, University of Calcutta |

Aggregate: 76.13% (Ranked 1st Class 2nd)

**All India Senior School Certificate Examination
(Class XII)**

2014

Central Model School, Kalyani (CBSE) | 1st Division – 84.6%

Indian Certificate of Secondary Education (Class X)

2012

Auxilium Convent School, Bandel (ICSE) | 1st Division – 83.2%

RESEARCH GRANTS & PROPOSALS APPLIED

**1. ICMR ANVESHAN Extramural Grant Call
for Investigator-Initiated Research-Principal
Investigator**

Applied: 2026

Proposal ID: IIRPSG(AN)-I-2026-01-03137 |

Proposed Timeline: 36 Months

Project Title: *Repurposing Ticagrelor to Target Platelet Driven P-selectin-PSGL1 Axis in Cancer Stem Cell Mediated Drug Resistance in Triple Negative Breast Cancer*

Collaborating Institutions: All India Institute of Medical Sciences (AIIMS) Kalyani; BRIC-Rajiv Gandhi Centre for Biotechnology (RGCB), Thiruvananthapuram, Kerala.

**2. ICMR Follow-on SMALL Extramural Grants
(ICMR Follow-on ANVESHAN Extramural
Grants)-Co-Principal Investigator**

Applied: 2026

Proposal ID: IIRPSG(AN)-F-2026-01-00611 |

Proposed Timeline: 36 Months

Project Title: *Targeting MRP4-Mediated Prostaglandin E2 Efflux of Tumor-Educated Platelets to Overcome Immune Suppression and Drug Resistance in Metastatic Breast Cancer*

Collaborating Institutions: Chittaranjan National Cancer Institute, Kolkata, Swami Vivekananda University, Barrackpore, West Bengal

NATIONAL COMPETITIVE EXAMS & ACADEMIC ACHIEVEMENTS

- **CSIR-UGC NET (JRF + LS):** Secured All India Rank (AIR) 38 in Life Sciences (General Category), 2019.
- **GATE (Life Sciences):** Successfully qualified in the national-level paper in 2019.

- **NPTEL-Faculty Development Programme (2026):** Achieved nationwide **1% Topper Status (Elite + Gold Certificate and All India topper)** in Host Pathogen Interaction (Immunology), conducted by IISER Bhopal (Credit Score: 3).

TECHNICAL RESEARCH SKILLS

Cell Biology & Immunology: Primary & established mammalian cell culture, 3D organoid culture (transwell and matrigel assays), hypoxia chamber handling. Isolation & co-culture of platelets, lymphocytes, dendritic cells, and cancer stem cells. Flow cytometry, MACS cell sorting, intracellular staining, and cellular apoptosis/proliferation tracking.

Molecular Biology: RNA extraction, cDNA synthesis, custom primer design, semi-quantitative PCR, quantitative Real-Time PCR (qPCR), Western blotting, siRNA-mediated gene knockdown, Lipofectamine-driven transfections, and downstream MTT/LDH metabolic cytotoxicity screenings.

Histology & Imaging: Paraffin embedding block preparation, cryosectioning, microtome & cryostat operation. Comprehensive multi-staining via Immunohistochemistry (IHC), Immunofluorescence (IF), and Immunocytochemistry (ICC). Confocal microscopy, fluorescence imaging, and Scanning Electron Microscopy (SEM).

In Vivo Model Systems: Handling, restraining, and executing multi-route therapeutic dosing in mouse streams (IP, IM, SC, and IV via tail vein & retro-orbital access). Specialized protocols for solid and ascitic tumor induction across C57BL/6J, Balb/c, and Swiss albino mice.

CORE RESEARCH INTERESTS

Breast Cancer Oncology • Tumor Immunology • Cancer Stem Cells & Niche Signaling • Tumor-Educated Platelets (TEPs) • Epithelial-to-Mesenchymal Transition (EMT) • Angiogenesis & Metastatic Cascades • Translational Cancer Pharmacology

EDITORIAL & PEER REVIEW EXPERIENCE

Book Editor — Springer Nature

In Progress (2026 Publication)

Invited Primary Editor for the forthcoming volume titled 'Platelet-Driven Oncogenesis - Crosstalk, Resistance and Therapeutic Targets', featured under the long-standing Cancer Drug Discovery and Development book series by Springer Nature.

Journal Reviewer

Scientific Reports (Springer Nature) • Journal of Experimental & Clinical Cancer Research (Springer Nature) • Frontiers in Immunology • Frontiers in Oncology • Frontiers in Bioengineering and Biotechnology • Frontiers in Medicine • Frontiers in Cell and Developmental Biology • Discover Oncology (Springer Nature)

SELECTED PUBLICATIONS

Corresponding-Author Peer-Reviewed Papers

Journal Article

1. Pal E, Chakraborty S, **Guha A**. Cell competition within breast tumor microenvironment: emerging role of cancer stem cells and immune cells in tumor progression and therapeutic implications. *Frontiers in Oncology*. 2026 Jul 22;16:1861308.

Book Chapters

1. **Book Name-Biotech Horizons: Translational Research in Human Health.**

Chapter Name- **Guha A**. Stem cells as targeted drug delivery systems for precision therapy
Department of Biotechnology Swami Vivekananda University Press- ISBN-978-93-5655-163-3

2. **Book Name-Essentials Of Microbiology Unearthing The Unseen.**

Chapter Name- **Guha A**. Mycobacterium tuberculosis as a Chronic Architect of the Tumor-Permissive Microenvironment

Department of Microbiology Swami Vivekananda University. ISBN -978-93-5635-848-5

3. **Book Name-Biotechnology: Bridging Fundamental Science and Applied Innovation.**

Chapter Name- **Guha A**. Cancer Stem Cell-Mediated Exhaustion of CD8+ T Cells in Breast Cancer: Mechanisms and Therapeutic Strategies to Overcome Immune Suppression

Department of Biotechnology Swami Vivekananda University. ISBN-978-93-5773-526-1

4. **Book Name- The Macroworld of the Microbes.**

Chapter Name- **Guha A**. Microbial Therapeutics in Oncology: A Comprehensive Review of Bacteria-Based Strategies for Cancer Treatment

Department of Microbiology Swami Vivekananda University. ISBN-978-93-5779-018-5

5. **Book Name-The Biotechnological Palimpsest: From Evolutionary Scratches to the Synthetic Future.**

Chapter Name- **Guha A**. The shift from clotting to cancer: The role of platelets

Department of Biotechnology Swami Vivekananda University. ISBN-978-93-5890-470-3

6. **Book Name-The Microbial Nexus: Intersections In Modern Science.**

Chapter name- **Guha A**. Engineering Micro-Organisms for Targeted Therapeutic Delivery in Breast Cancer Treatment

Department of Microbiology Swami Vivekananda University. ISBN-978-93-5890-755-1

First-Author Peer-Reviewed Papers

Journal Articles

1. **Guha A**, Sultana J, Bhuniya A, Chakravarti M, Bera S, Sarkar A, Dhar S, Roy Choudhury P, Das J, Ganguly N, Guha I. Tumor-Educated-Platelets interact with Breast Cancer-Stem-Cells via P-selectin-PSGL1 and ensure stemness and metastasis through WNT- β -Catenin-VEGF-VEGFR2 intra-cellular signaling: Therapeutic modulation by aspirin. *Breast Cancer Research, BMC, Springer Nature*, 2025.
2. **Guha A**, Banerjee S. Trogocytosis at the crossroad of cancer and immunity: mechanisms, implications and therapeutic perspectives. *Frontiers in Cell and Developmental Biology*. 2025 Oct 17;13:1676945.
3. **Guha A**, Goswami KK, Sultana J, Ganguly N, Choudhury PR, Chakravarti M, Bhuniya A, Sarkar A, Bera S, Dhar S, Das J. Cancer stem cell-immune cell crosstalk in breast tumor microenvironment: A determinant of therapeutic facet. *Frontiers in Immunology*. 2023 Nov 27;14:1245421.

Co-Author Peer-Reviewed Papers

Journal Articles

4. Choudhury PR, Chakravarti M, Bera S, Arora P, Sultana J, Khan MA, Biradar R, **Guha A**, Dhar S, Ghosh I, Ganguly N, Lasure A, Kashyap P, Das J, Mandal B, Das P, Sarkar A, Datta D, Nandi S, Alam N, Baral R, Banerjee S, Bose A. Atorvastatin Pre-exposure in Hypercholesterolemia Remedies 27HC Mediated Dendritic Cell Dysfunctions in Triple-Negative Breast Cancer. *Molecular Therapy: Oncology, Cell Press*, 2026.
5. Sultana J, Choudhury PR, Bera S, Chakravarti M, **Guha A**, Das P, Das J, Iyer GS, Sarkar A, Dhar S, Ganguly N. Notch signalling in T cells: bridging tumour immunity and intratumoral cellular crosstalk. *Frontiers in Immunology*. 2025 Oct 2;16:1659614.
6. Sultana J, Choudhury PR, **Guha A**, Das P, Bera S, Das J, Banerjee S. Evolving Trends in Breast Cancer Immunotherapy: Recent Updates. *Journal of Current Oncological Trends*. 2025 Jan 1;2(1):51-64.

7. Chakravarti M, Bera S, Dhar S, Sarkar A, Choudhury PR, Ganguly N, Das J, Sultana J, **Guha A**, Biswas S, Das T. Neem Leaf Glycoprotein Disrupts Exhausted CD8+ T-Cell-Mediated Cancer Stem Cell Aggression. *Molecular Cancer Research*. 2024 Aug 2; 22(8):759-78.
8. Bhuniya A, Sarkar A, **Guha A**, Choudhury PR, Bera S, Sultana J, Chakravarti M, Dhar S, Das J, Guha I, Ganguly N. Tumor activated platelets induce vascular mimicry in mesenchymal stem cells and aid metastasis. *Cytokine*. 2022 Oct 1;158:155998.

Articles in preprint servers

9. Sultana J, **Guha A**, Chakravarti M, Ulgekar G, Bera S, Choudhury PR, Dhar S, Das J, Ganguly N, Sarkar A, Saify M. Breast cancer stem cells mediated CD8+ T cell exhaustion among different molecular subtypes of breast cancer regulated via NOTCH1/RBPJ/PD-L1 axis. *bioRxiv*. 2026:2026-05.

Peer-Reviewed Conference Proceedings

10. **Guha A**, et al. Evaluating interaction between tumor educated platelets and cancer stem cells on breast cancer subtypes. *Journal of Clinical Oncology*. 2024 Aug 12;42: 23 suppl, 5-5.
11. **Guha A**, et al. Tumor educated platelets promote disease advancement in breast cancer by interacting with cancer stem cells. *ESMO Open*. 2024 May 1;9. Volume 9, 103084.
12. Sultana J, **Guha A**, et al. Intervention of intra-tumoral breast cancer stem cells and CD8+ T cell dysregulation: the impact of 2-deoxy-D-glucose. *Journal for ImmunoTherapy of Cancer* 2024;12.
13. Choudhury PR, ..., **Guha A**, et al. Pre-exposure of atorvastatin remedies hypercholesterolemia mediated intratumoral dendritic cell dysfunctions in triple negative breast cancer. *Journal for ImmunoTherapy of Cancer* 2025.

CONFERENCES & BOOK CHAPTERS SUMMARY

- **First-Author International Presentations: 4 Oral/Poster presentations** at high-tier international summits (including ICSCC&RIPSSCON AIIMS New Delhi 2023; JISIAR 2025; ASCO Breakthrough Yokohama Japan 2024; ESMO Breast Cancer Berlin Germany 2024).
- **First-Author National Presentations: 6 Oral/Poster presentations** at key national forums (including IACR 2022, National Science Day CNCI 2022, SBC 2022, NIOS NCRI 2023, JIS 2024, Anusandhan Bose Institute 2025).
- **Co-Author Conference Presentations: 18 National presentations** (IACR, IMMUNOCON, etc.) and **2 International presentations** (SITC 2024, 2025).
- **Book Chapters (with ISBN): 6 peer-reviewed book chapters** cataloged with standard ISBN registration identifiers.

MENTORING & SUPERVISORY EXPERIENCE

Research Mentor & Bench-work Advisor

Assistant Professorship Tenure

Ongoing Master's Thesis- 4 Post Graduate students from the Department of Biotechnology and 1 Post Graduate student from the Department of Microbiology, Swami Vivekananda University. **Date of completion-** November 2026

HONORS, AWARDS & FELLOWSHIPS

- **SERB International Travel Grant (2024):** Conferred by the Science and Engineering Research Board, Department of Science & Technology (DST), Govt. of India to present research at **ESMO Breast Cancer, Germany.**
- **CSIR International Travel Grant (2024):** Conferred by the Council of Scientific & Industrial Research to present breakthroughs at **ASCO Breakthrough, Yokohama, Japan.**
- **CSIR JRF & SRF Fellowship (2020 – 2024):** Awarded competitive national doctoral fellowship for executing advanced primary breast cancer research.
- **1st Prize in Poster Presentation (2024):** Won at the 'Advances In Biology' breakthrough platform, jointly hosted by **JIS University and the Microbiologists Society, India.**
- **2nd Prize in Oral Presentation (2023):** Conferred at the high-profile oncology conference stream of **ICSCC&RIPSSCON**, hosted at **AIIMS New Delhi.**
- **Academic Excellence Award (2017):** Presented by **Lady Brabourne College** in recognition of outstanding performance across the undergraduate Zoology honors curriculum.

PROFESSIONAL MEMBERSHIPS

- Active Member, **American Society of Clinical Oncology (ASCO)**
- Active Member, **European Society for Medical Oncology (ESMO)**

ACADEMIC & RESEARCH REFERENCES

Dr. Saptak Banerjee

Senior Scientific Officer Grade II

Dept. of Immunoregulation & Immunodiagnostics
Chittaranjan National Cancer Institute, Kolkata
Email: drsaptakbanerjee@gmail.com

Dr. Arnab Pal

Professor

Department of Biochemistry, Tumor Biology Lab
PGIMER, Chandigarh, India
Email: pal.arnab@pgimer.edu.in

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Assistant Professor

Department of Pharmaceutical Technology
NIPER, S.A.S. Nagar, Mohali, Punjab
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Dr. Rathindranath Baral

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