

## Personal Profile

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**Dr. Arnab Ghosh**  
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## Educational Profile

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- Ph.D.** University of Burdwan, Bardhaman, West Bengal;  
Year of award : 2015  
Supervisor: Prof. Anupam Basu
- M.Sc.** University of North Bengal, Siliguri, West Bengal;  
Subject: Zoology  
Specialization: Molecular Biology
- B.Sc.** University of Burdwan, Bardhaman, West Bengal;  
Subject: Zoology

## Professional Experience

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- Post-doctoral Fellowship** July 2019- October 2021  
University of Kansas Medical Center  
Kansas City, USA  
Supervisor: Prof. Andrew K Godwin
- Post-doctoral Fellowship** October. 2015- June 2019  
Kansas City VA Medical Center  
Kansas City, USA  
Supervisor: Prof. Sushanta K Banerjee
- Research Associate** February 2015- September. 2015  
Indian Institute of Technology  
Kharagpur, India  
Supervisor: Prof. Chandan Chakraborty
- Guest Lecturer** Mar.2007- July. 2009  
Indas Mahavidyalaya

## **Awards & Honours**

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1. **AAISCR-Legacy Immigration Travel Scholarship** for attending **AACR annual meeting 2018**, sponsored by AAISCR, Chicago, Illinois on April 14-18, **2018**.
2. 1<sup>st</sup> position, “**Shri. K. N. Narasimhaiah Award**”, for best original paper presentation in Cancer Biology, International Symposium on Genetic Analysis: Translational and Developmental & Annual Meeting of Society of Biotechnologists (India), , The University of Burdwan, West Bengal, India, November 21-23, **2014**.
3. **1<sup>st</sup> position in the M.Sc. Final Examination, “University of North Bengal Gold Medal 2006”**, University of North Bengal, West Bengal, India.

## **Membership of Professional Bodies**

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1. Associate member of **American Association for Cancer Research**, 2017-present.
2. Associate member of **American Society for Biochemistry and Molecular Biology**, 2017-present.
3. Member of **Indian Society of Cell Biology**, 2012-present.
4. Member of **Society of Biotechnologists (India)**, 2014-present.
5. Member of **Indian Science Congress Academy**, 2012-present.
6. Member of Zoological association of Burdwan(India), 2010-present.
7. Member of Indian National Service Scheme (NSS), 2007-present.

## **Research Interests**

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1. Biomarker discovery.
2. Lower respiratory track disease.
3. Drug resistance.
4. Human genetic disorders and genetic screening.

## **Research Publications**

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1. CCN5 Activation by free or encapsulated-EGCG is required to Render Triple-negative breast cancer cell Viability and Tumor Progression. Das A, Haque I, Ray P, **Ghosh A**, Dutta D, Quadir M, De A, Gunewardena S, Chatterjee I, Banerjee S, Weir S, Banerjee SK. *Pharmacology Research & Perspectives*. **2021**. Apr;9(2):e00753. doi: 10.1002/prp2.753.
2. CYR61/CCN1 regulates dCK and CTGF and causes gemcitabine resistant phenotype in pancreatic ductal adenocarcinoma. **Ghosh A**<sup>\*\*</sup>, Maity G\*, Gupta V\*, Haque I, Sarkar S, Das A, Dhar K, Bhavanasi S, Gunewardena S.S, Von Hoff D.D, Mallik S, Kambhampati S, Banerjee S.K, Banerjee S. *Molecular Cancer Therapeutics*. 18(4) April **2019**, doi: 10.1158/1535-7163.MCT-18-0899 (**#Corresponding author, \*Equal first author contribution**).

3. Cyr61/CCN1 targets for chemosensitization in pancreatic cancer. Banerjee S, **Ghosh A**, VonHoff DD, Banerjee SK. *Oncotarget*. **2019**, Jun 4;10(38):3579-3580. doi: 10.18632/oncotarget.26986.
4. Microenvironment-sensing, nanocarrier-mediated delivery of combination chemotherapy for pancreatic cancer. Ray P, NB Gauthami, **Ghosh A**, Banerjee, YG Mikhail, Banerjee SK, Reindl K, Mallik S, Quadir M. *Journal of Cell Communication and Signaling*. **2019**. March 26, doi: 10.1007/s12079-019-00514-w.
5. Size-transformable, multifunctional nanoparticles from hyperbranched polymers for environment-specific therapeutic delivery. Ray P, Alhalhooly L, **Ghosh A**, Choi Y, Banerjee S, Mallik S, Banerjee S, Quadir M. *ACS Biomaterials*. **2019** January 15, doi: 10.1021/acsbiomaterials.8b01608.
6. Aspirin Suppresses Tumor cell-induced Angiogenesis and their Incongruity. Maity G, Chatterjee J, **Ghosh A**, Haque I, Banerjee S, Banerjee SK. *Journal of Cell Communication and Signaling*. **2018**, Nov 29. doi: 10.1007/s12079-018-0492-0.
7. Protein PEGylation for cancer therapy: bench to bedside. Gupta V, Bhabanasi S, Quadir M, Singh K, Ghosh G, Vasamreddy K, **Ghosh A**, Siahaan TJ, Banerjee S, Banerjee SK. *J Cell Commun Signal*. **2018**. November 29. doi. 10.1007/s12079-018-0492-0.
8. MIND model for triple-negative breast cancer in syngeneic mice for quick and sequential progression analysis of lung metastasis. **Ghosh A**, Sarkar S, Banerjee S, Behbod F, Tawfik O, et al. *PLOS ONE*. **2018**, 13(5): 0198143. <https://doi.org/10.1371/journal.pone.0198143>.
9. The MAZ transcription factor is a downstream target of the oncoprotein Cyr61/CCN1 and promotes pancreatic cancer cell invasion via CRAF-ERK signaling. **Ghosh A\***, Maity G\*, Haque I\*, Dhar G, Gupta V, Sarkar S, Azeem I, McGregor D, Choudhary A, Campbell DR, Kambhampati S, Banerjee SK, Banerjee S. *The Journal of Biological Chemistry*. **2018**, Mar 23;293(12):4334-4349. doi: 10.1074/jbc.RA117.000333. Epub 2018 Feb 6. (**\*Equal first author contribution**).
10. Leptin-induced ER- $\alpha$ -positive breast cancer cell viability and migration is mediated by suppressing CCN5-signaling via activating JAK/AKT/STAT-pathway. **Ghosh A\***, Haque I\*, Acup S, Banerjee S, Dhar K, Ray A, Sarkar S, Kambhampati S, Banerjee SK. *BMC Cancer*. **2018**, Jan 25;18(1):99. doi: 10.1186/s12885-018-3993-6. (**\*Equal first author contribution**).
11. CCN5/WISP-2 restores ER- $\alpha$  in normal and neoplastic breast cells and sensitizes triple negative breast cancer cells to tamoxifen. **Ghosh A\***, Sarkar S\*, Banerjee S, Maity G, Das A, Larson MA, Gupta V, Haque I, Tawfik O, Banerjee SK. *Oncogenesis*. **2017** May 22;6(5):e340. doi: 10.1038/oncsis.2017.43. (**\*Equal first author contribution**).
12. Deficiency of CCN5/WISP-2-Driven Program in breast cancer Promotes Cancer Epithelial cells to mesenchymal stem cells and Breast Cancer growth. Das A, Dhar K, Maity G, Sarkar S, **Ghosh A**, Haque I, Dhar G, Banerjee S, Banerjee SK. *Scientific Reports*. **2017** Apr 27;7(1):1220. doi: 10.1038/s41598-017-00916-z.

13. Human pancreatic cancer progression: an anarchy among CCN-siblings. Banerjee SK, Maity G, Haque I, **Ghosh A**, Sarkar S, Gupta V, Campbell DR, Von-Hoff D, Banerjee S. *Journal of Cell Communication and Signaling*. **2016**, Sep;10(3):207-216. Epub 2016 Aug 19.
14. Exosomes in carcinogenesis: molecular palsies carry signals for the regulation of cancer progression and metastasis. Subramanian A, Gupta V, Sarkar S, Maity G, Banerjee S, **Ghosh A**, Harris L, Christenson LK, Hung W, Bansal A, Banerjee SK, *Journal of Cell Communication and Signaling*. **2016**, Sep;10(3):241-249. Epub 2016 Jul 29.
15. The miRacle in Pancreatic Cancer by miRNAs: Tiny Angels or Devils in Disease Progression. Hawa Z, Haque I, **Ghosh A**, Banerjee S, Harris L, Banerjee SK. *International Journal of Molecular Sciences*. **2016**, May 26;17(6). pii:E809. doi: 10.3390/ijms17060809.
16. A study of the expression and localization of toll-like receptors 2 and 9 in different grades of cervical intraepithelial neoplasia and squamous cell carcinoma. **Ghosh A**, Dasgupta A, Bandyopadhyay A, Ghosh T, Dalui R, Biswas S, Banerjee U, Basu A. *Experimental and Molecular Pathology*. **2015**, Dec;99(3):720-4. doi: 10.1016/j.yexmp.2015.11.015. Epub 2015 Nov 11.
17. Expression of matrix metalloproteinase-2 and 9 in cervical intraepithelial neoplasia and cervical carcinoma among different age groups of premenopausal and postmenopausal women. **Ghosh A**, Moirangthem A, Dalui R, Ghosh T, Bandyopadhyay A, Dasgupta A, Banerjee U, Jana N, Basu A. *Journal of Cancer Research and Clinical Oncology*. **2014**, Sep;140(9):1585-93. doi: 10.1007/s00432-014-1695-2. Epub 2014 May 8.

#### **Manuscripts under revision/preparation**

1. Ray P, Alhalhooly L, **Ghosh A**, Choi Y, Banerjee SK, Mallik S, Banerjee S, Quadir M. Size-adaptable, Multi-functional Nanoparticles from Hyperbranched Polymers for Environment-specific Molecular Transport. **ACS Macro Letters**. *(Under Review)*.
2. Ray P, NB Gauthami, **Ghosh A**, Banerjee S, Banerjee SK, Reindl K, Mallik S, Quadir M. Controlled and combination delivery of chemotherapy for pancreatic Cancer. **Chemical Communications**. *(Under Review)*.
3. **Ghosh A**, Sarkar S, Ghosh S, Ray P, Quadir M, Banerjee SK, Banerjee S. Zoledronic acid-induced suppression of invasive phenotypes of pancreatic cancer cells is mediated through downregulation of CYR61/CCN1. *(Manuscript in preparation)*
4. **Ghosh A**, Sarkar S, Banerjee S, Maity G, Das A, Gupta V, Haque I, Tawfik O, Larson M, Banerjee SK. CCN5 alters HER2 expression in-vivo and in-vitro. *(Manuscript in preparation)*
5. **Ghosh A**, Ghosh P, Maity G, Banerjee SK, Banerjee S. Activation of CCN1 signalling in solid tumor cells diminishes response to a histone deacetylase inhibitor. *(Manuscript in preparation)*

## **Patents**

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1. **Ghosh A**, Sarkar S, Maity G, Banerjee SK and Banerjee S (2018).“ Generation of PEGylated CCN5/WISP-2 for cancer therapy”. (Applied for, File # VA ID No. 2018-249)
2. **Ghosh A**, Banerjee SK and Banerjee S (2018).“Metastatic MIND model for triple negative breast cancer in syngeneic mice”. (Applied for, File # VA ID No. 2018-114).

## **Professional associations**

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1. Associate member of **American Association for Cancer Research**, 2017-present.
2. Associate member of **American Society for Biochemistry and Molecular Biology**, 2017-present.
3. Member of **Indian Society of Cell Biology**,.2012-present.
4. Member of **Society of Biotechnologists (India)**, 2014-present.
5. Member of **Indian Science Congress Academy**, 2012-present.
6. Member of Zoological association of Burdwan(India), 2010-present.
7. Member of Indian National Service Scheme (NSS), 2007-present.

## **Ad hoc reviewer and editorial duties**

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1. Scientific Reports. – Springer Nature
2. Journal of Cell Communication and Signaling – Springer Nature
3. PLOS ONE
4. BMC Cancer Research
5. Cells-MDPI
6. Cancers-MDPI
7. Biomedicines- MDPI
8. Topic Editor – Biology – MDPI.

## **Course/Conference/Workshop etc. attended**

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### **Oral presentations:**

1. **Ghosh A**, Maity G, Gupta V, Haque I, Sarkar S, Das A, Dhar K, Bhavanasi S, Gunewardena SS, Von Hoff DD, Mallik S, Kambhampati S, Banerjee SK, Banerjee S (2019) Gemcitabine Sensitivity is Improved in Pancreatic Cancer by CYR61/CCN1-Depletion-Mediated Upregulation of dCK and Suppression of CTGF. Poster presented in Spotlight session, **Experimental Biology 2019, Orlando, FL**.
2. **Ghosh A**, Sarkar S, Von Hoff DD, Mallik S, Banerjee SK. CYR61/CCN1 causes gemcitabine resistance in pancreatic ductal adenocarcinoma by regulating dCK and CTGF. (2018). **XLII All India Cell Biology Conference**, December 21-23, organized by **Department of Biological Science, BITS Pilani, K.K Birla Goa Campus and Indian Society for Cell Biology**.
3. **Ghosh A**, Bandopadhyay A, Dalui R, Dasgupta A, Ghosh TK, Basu A (2014) Expression of selective matrix metalloproteinases and toll-like receptors in preinvasive and invasive

carcinoma of the uterine cervix." 21<sup>st</sup> West Bengal State science and technology congress, February 20-21, Organized by West Bengal ministry of science and biotechnology and the **University of Burdwan, West Bengal, India.**

4. **Ghosh A**, Dasgupta A, Dalui R, Ghosh TK, Basu A (2012) Expression of Matrix metalloproteinases 2 and 9 in different stages of cervical neoplasia and cancer. XXXVI All India Cell Biology Conference and International Symposium on Stress Adaptive Response and Genome integrity. October 17-19, organized by the **Indian Society of Cell Biology and Bhabha Atomic Research Centre, Mumbai, India.**
5. **Ghosh A**, Basu A (2010) Screening of angiogenesis inhibitors for controlling cervical carcinoma using chick chorioallantoic membrane model. Golden Jubilee International Seminar, Researches in Zoology - Basic and Applied. March 17-19, **University of Burdwan, Burdwan, West Bengal, India.**
6. **Ghosh A**, Rout JK, Dasgupta A, Ghosh TK, Basu A (2010) A pilot study on the occurrence of the cervical cancer and it's molecular diagnosis among subjects attending Burdwan Medical college and hospital. Golden Jubilee International Seminar, Researches in Zoology - Basic and Applied. March 17-19, **University of Burdwan, Burdwan, West Bengal, India.**

### **Abstracts presented:**

1. **Ghosh A**, Maity G, Gupta V, Haque I, Sarkar S, Das A, Dhar K, Bhavanasi S, Gunewardena SS, Von Hoff DD, Mallik S, Kambhampati S, Banerjee SK, Banerjee S (2019) Gemcitabine Sensitivity is Improved in Pancreatic Cancer by CYR61/CCN1-Depletion-Mediated Upregulation of dCK and Suppression of CTGF. Poster presented in **Experimental Biology 2019, Orlando, FL.**
2. **Ghosh A**, Sarkar S, Ghosh S, Ray P, Quadir M, Banerjee SK, Banerjee S (2019) Zoledronic acid-induced suppression of invasive phenotypes of pancreatic cancer cells is mediated through downregulation of CYR61/CCN1. Proceedings of the American Association for Cancer Research: April 2019. Poster presented in **AACR Annual Meeting 2019, Atlanta, GA.**
3. **Ghosh A**, Sarkar S, Banerjee S, Banerjee Sk (2018) A syngeneic MIND model for triple negative breast cancer: A novel metastatic mouse model for disease progression and therapeutic studies. Proceedings of the American Association for Cancer Research: April 2018. Poster presented in **AACR Annual Meeting 2018, Chicago, IL.**
4. **Ghosh A**, Das A, Banerjee S, Baltezor M, Zeng L, Banerjee SK (2018) EGCG promotes cell growth inhibition and reprograms mesenchymal-epithelial transition by restoring CCN5/WISP2 in triple negative breast cancer cells in vitro and in vivo. The FASEB Journal 2018 32:1\_supplement, 668.10-668.10. Poster presented in **Experimental Biology 2018, San Diego, CA.**
5. **Ghosh A**, Ghosh P, Maity G, Banerjee SK, Banerjee S (2017) Activation of CCN1 signaling in solid tumor cells diminishes response to a histone deacetylase inhibitor: A dark side of HDACs. Proceedings of the American Association for Cancer Research.(58):April 2017. Poster presented in **AACR Annual Meeting 2017, Washington DC.**
6. **Ghosh A**, Ghosh P, Maity G, Banerjee SK, Banerjee S (2017) Activation of Cyr61 signaling in solid tumor cells diminishes response to a histone deacetylase inhibitor: Challenges for HDACs FASEB J April 2017 31:775.16. Poster presented in **Experimental Biology 2017, Chicago, IL.**

7. Sarkar S, **Ghosh A**, Maity G, Banerjee S, Banerjee SK (2017) DCIS to invasive progression in breast cancer is delayed by restoring CCN5. Proceedings of the American Association for Cancer Research.(58):April 2017. **AACR Annual Meeting 2017, Washington DC.**
8. Maity G, **Ghosh A**, Das A, Sarkar S, Banerjee S, Banerjee SK (2017) CCN5/WISP-2 is a negative regulator of epithelial to mesenchymal transition and stemness in breast cancer. Proceedings of the American Association for Cancer Research.(58):April 2017. **AACR Annual Meeting 2017, Washington DC.**
9. Gupta V, **Ghosh A**, Maity G, Haque I, Banerjee SK, Banerjee S (2017) CCN1/Cyr61 regulation of gemcitabine-resistant phenotype in pancreatic cancer: involvement of CTGF and dCK. Proceedings of the American Association for Cancer Research.(58):April 2017. **AACR Annual Meeting 2017, Washington DC.**
10. Chakraborty J, Maity G, **Ghosh A**, Banerjee S, Banerjee SK. Regulation of tumor angiogenesis by low dose Aspirin (2017) Proceedings of the American Association for Cancer Research.(58):April 2017. **AACR Annual Meeting 2017, Washington DC.**
11. Sarkar S, **Ghosh A**, Banerjee S, Maity G, Das A, Gupta V, Haque I, Tawfik O, Larson M, Banerjee SK (2017) CCN5/WISP-2 activates estrogen receptor- $\alpha$  in normal and cancerous breast epithelial cells and sensitizes them to hormonal therapy. FASEB J April 2017 31:775.13. **Experimental Biology 2017, Chicago, IL.**
12. Maity G, **Ghosh A**, Chakraborty J, Banerjee S, Banerjee SK (2017) Aspirin: A Regulator of Tumor Angiogenesis in Breast Cancer. FASEB J April 2017 31:775.17. **Experimental Biology 2017, Chicago, IL.**
13. **Ghosh A**, Moirangthem A, Dalui R, Ghosh TK, Bandyopadhyay A, Dasgupta A, Banerjee U, Jana N, Basu A (2014) Expression of selective matrix metalloproteinases and toll like receptors in cervical intraepithelial neoplasia and cancer. Poster presented in International Symposium on Genetic Analysis: Translational and Developmental & Annual Meeting of Society of Biotechnologists (India). November 21-23, Society of Biotechnologists (India) and the Department of Zoology, **The University of Burdwan, Burdwan, West Bengal, India.**
14. **Ghosh A**, Moirangthem A, Dalui R, Ghosh TK, Bandyopadhyay A, Biswas s, Dasgupta A, Banerjee U, Basu A (2013) Expression of Toll-Like Receptor 2 and 9 in different grades of cervical cancer. Poster presented in XXXVII **All India Cell Biology Conference.** December 22-24, Indian Society of Cell Biology and inStem, Bangalore.
15. **Ghosh A**, Moirangthem A, Dalui R, Ghosh TK, Bandyopadhyay A, Biswas s, Dasgupta A, Banerjee U, Basu A (2013) Expression of Metalloproteinases 2 and 9 in different grades of cervical cancer. Poster presented in 100<sup>th</sup> **Indian Science Congress.** January 3-7, The Indian Science Congress Association.

### **Workshop attended:**

1. Seminar on Frontiers in Molecular Biology and Workshop on Basic Flowcytometry (2012), July 9, The Department of Zoology, The University of Burdwan, West Bengal, India.
2. National workshop on Biostatistics, application on Computational Statistics in Medicine and Biology (2011), September 8-10, School of Medical Science and Technology, Indian Institute of Technology, Khargapur, India.
3. National workshop on Molecular Biology Techniques, (2009) September 07-19, Department of Zoology, The University of Burdwan, West Bengal, India.