

## Bio-data of Dr. Rakesh Kundu

Name: **Dr. Rakesh Kundu**

Designation: **Assistant Professor**

Department/Institute/University: **Cell Signaling Laboratory  
Department of Zoology  
Visva-Bharati (a Central University)  
Santiniketan – 731 235, West Bengal**



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Date of Birth: **26.09.1978** Sex (M/F): **Male**

### Education:

| Sl. No. | Institution               | Degree Awarded | Year | Subject                     |
|---------|---------------------------|----------------|------|-----------------------------|
| 1.      | The University of Burdwan | B.Sc.          | 2000 | Zoology                     |
| 2.      | Banaras Hindu University  | M.Sc.          | 2003 | Zoology (Spl. Biochemistry) |
| 3.      | Visva-Bharati             | Ph.D.          | 2009 | Hepatology, Toxicology      |

\* Ph.D. under Prof. Samir Bhattacharya (FNA, FASc, FNASc, former Director CSIR-IICB, Kolkata), Department of Zoology, Visva-Bharati, Santiniketan.

**Area of expertise/interest:** Diabetes Type 2 |  $\beta$  cell Biology | Cell signaling

Research scholars: 2 JRFs and 2 SRFs | Ph.D. awarded – 3 | Postgraduate dissertations guided – 29  
Foreign Fellow – Dr. O.C. Ejelonu, Department of Biochemistry, Ekiti State University Ado-Ekiti, Nigeria (worked under RTF-DCS fellowship scheme by NAM S&T, Ministry of Science & Technology in 2016)

### Position

- Assistant Professor, Visva-Bharati since 21.12.2012-till date
- Dr. D.S. Kothari Post-doctoral Fellow at Visva-Bharati from 07.07.2012-20.12.2012
- Post-doctoral fellow, CSIR-Research Associate at Visva-Bharati from 01.04.2011-30.06.2012
- Project Assistant level-I, CSIR-North East Institute of Science & Technology, Jorhat from 09.12.2010-31.03.2011
- Assistant Professor (temporary), Guru Ghasidas University, Bilaspur from 10.08.2009-30.06.2010
- Junior Research Fellow and Senior Research Fellow at Visva-Bharati, from 01.09.2004-09.08.2009
- Junior Research Fellow at Bose Institute, Kolkata from 23.09.2003-30.08.2004

### Honors/Awards:

- **SIRE (SERB International Research Experience)** visiting scientist scheme from SERB, Govt. of India, for Visiting the University of Bremen, Germany, 2022
- **INSA Visiting Scientist**, Indian National Science Academy, 2021-22
- **ISE Travel Fellowship Award** from International Society of Endocrinology (ISE) to attend ICE-SEMDSA 2018 conference at Cape Town, South Africa, 2018.
- **Early Career Research Award**, SERB, Govt. of India, 2017
- UGC-BSR Research Start-up-Grant, UGC, Govt. of India, 2014
- Dr. D.S. Kothari Post-doctoral Fellowship from UGC, 2012
- CSIR-Research Associateship from CSIR, Govt. of India 2011

- Best poster award in the international symposium of Asia & Oceania Society for Comparative Endocrinology (AOSCE) held in North Bengal University, Siliguri during Dec' 2007.
- CSIR-UGC NET-JRF, 2003
- ICMR- JRF, 2003; GATE, 2003

### **Professional experience and training related to screening and application of anti-cancer compounds**

Dr. Rakesh Kundu is presently working in the line of Type 2 diabetes. During his doctoral studies he has worked in the area of hepatobiology especially on the bilirubin metabolizing enzyme, UDP-glucuronosyl transferase, its activity, expression, regulation and significance in liver ailments (*J Ethnopharmacol*, 2008; *Biochem Pharmacol*, 2011). His postdoctoral studies involved fatty acid mediated insulin resistance and insulin signaling defects in the skeletal muscle and liver (*BBA-Mol Basis Dis*, 2009). During this period, he could also screen compounds from plant sources and successfully isolated potential anti-diabetic materials (*Mol Cell Biochem*, 2010), few of which were submitted for Indian/US patents. He also worked in a team investigating on the role of TLR4 in the fatty acid mediated insulin resistance. Their findings made a breakthrough that helped to understand how fetuin-A, a circulatory glycoprotein, play role in lipid mediated inflammation in the insulin target organs (*Nat Med*, 2012; *J Biol Chem*, 2013). Dr. Kundu's lab is now engaged in understanding the role of fetuin-A in creating a microenvironment of metinflammation in the pancreatic islets that causes beta-cell dysfunction and death during chronic hyperlipidemic condition (*BBRC*, 2017; *Mol Cell Endo*, 2021; *J Cell Sc*, 2021 and *J Cell Physiol*, 2022). These findings are interesting and will surely explore the area of obesity induced beta-cell dysfunction and loss of functional mass of the pancreas.

### **Publications:**

1. OC Ejelonu, OO Elekofehinti, IG Adanlawo, R Kundu. TGR5 potentiates GLP-1 secretion and cause pancreatic islet regeneration in response to *Tithonia diversifolia* saponin-rich extract in diabetic model mice. *Phytomedicine Plus*, 2 (1), 100203, 2022.
2. A. Karmakar, T. Mallick, C. Fouzder, A. Mukhuty, S. Mondal, R. Kundu, N. A. Begum (2022). Understanding the Role of Flavonoid Based Small Molecules in Modulating the Oncogenic Protein-Protein Interactions: A Quest for Therapeutic Arsenal. *Journal of Molecular Structure*, 1248:131511, 2022.
3. A Mukhuty, C Fouzder, R Kundu. Fetuin-A secretion from  $\beta$ -cells leads to accumulation of macrophages in islets, aggravates inflammation and impairs insulin secretion. *Journal of Cell Science*, 134 (21):1-14, 2021.
4. T. Mallick, A. Karmakar, A. Mukhuty, C. Fouzder, J. Mandal, S. Mondal, A. Pramanik, R. Kundu and N. A. Begum. Exploring the Propensities of Fluorescent Carbazole Analogs toward the Inhibition of Amyloid Aggregation in Type 2 Diabetes: An Experimental and Theoretical Endeavor. *Journal of Physical Chemistry B*, 125(37):10481–10493, 2021.
5. A. Mukhuty, C. Fouzder, R. Kundu. Fetuin-A excess expression amplifies lipid induced apoptosis and  $\beta$ -cell damage. *Journal of Cellular Physiology*, 237:532-550, 2021.
6. A. Mukhuty, C. Fouzder, R. Kundu. Blocking TLR4-NF- $\kappa$ B pathway protects mouse islets from the combinatorial impact of high fat and fetuin-A mediated dysfunction and restores ability for insulin secretion. *Molecular and Cellular Endocrinology*, 532, 111314, 2021.
7. C. Fouzder, A. Mukhuty, R. Kundu. Kaempferol inhibits Nrf2 signalling pathway via downregulation of Nrf2 mRNA and induces apoptosis in NSCLC cells. *Archives of Biochemistry and Biophysics* 697, 108700, 2021.
8. C. Fouzder, A. Mukhuty, S. Mukherjee, C. Malick, R. Kundu. Trigonelline inhibits Nrf2 via EGFR signalling pathway and augments efficacy of Cisplatin and Etoposide in NSCLC cells. *Toxicology in Vitro* 70, 105038, 2021.

9. A. Karmakar, T. Mallick, C. Fouzder, A. Mukhuty, S. Mondal, A. Pramanik, R. Kundu, D. Mandal, N.A. Begum. Unfolding the Role of a Flavone-Based Fluorescent Antioxidant towards the Misfolding of Amyloid Proteins: An Endeavour to Probe Amyloid Aggregation. *Journal of Physical Chemistry B* 124, 11133-11144, 2020.
10. D. Roy, A. Mukhuty, C. Fouzder, N. Bar, S. Chowdhury, R. Kundu, P. Chowdhury. Multi-emissive biocompatible silicon quantum dots: Synthesis, characterization, intracellular imaging and improvement of two fold drug efficacy. *Dyes and Pigments* 186, 109004, 2020.
11. A. Sarkar, C. Fouzder, S. Chakraborty, E. Ahmmed, R. Kundu, S. Dam, P. Chattopadhyay, K. Dhara. A Nuclear-Localized Naphthalimide-Based Fluorescent Light-Up Probe for Selective Detection of Carbon Monoxide in Living Cells. *Chemical Research in Toxicology* 33 (2), 651-656, 2020.
12. C. Malick, S.K. Chatterjee, S. Bhattacharya, V.R. Suresh, R. Kundu, S.K. Saikia. Gustatory ultrastructures of an amphihaline migratory fish hilsa *Tenualosailisha*, *Microscopy Research and Technique* 83(5), 507-513, 2020.
13. S.K. Chatterjee, C. Malick, S. Bhattacharya, V.R. Suresh, R. Kundu, S.K. Saikia. Ectopic expression of olfactory receptors and associated G-protein subunits in the head integument of the amphihaline migratory fish hilsa *Tenualosailisha*. *Journal of Fish Biology* 95 (1), 324-334, 2019.
14. R. Kundu. Islet inflammation and beta cell dysfunction by fat and Fetuin-A. *Diabetologia* 62 (1), 1-600, 2019.
15. D. Roy, C. Fouzder, A. Mukhuty, S. Pal, M. K. Mondal, R. Kundu, P. Chowdhury. Designed synthesis of dual emitting silicon quantum dot for cell imaging: Direct labeling of Alpha 2-HS-Glycoprotein. *Bioconjugate Chemistry* 30(5): 1575-1583, 2019.
16. Karmakar, A., Mallick, T., Fouzder, C., Mukhuty A., Kundu, R., Begum, N.A. Antioxidant flavone functionalized fluorescent and biocompatible metal nanoparticles: Exploring their efficacy as cell imaging agents. *Nano-Structures and Nano-Objects* 18, 100278, 2019.
17. R. Kundu, A. Mukhuty. Fetuin A—A Major Player in Lipid-Induced Islet Dysfunction and  $\beta$ -Cell Apoptosis. *Diabetes* 67 (Supplement 1), 2466-PUB, 2018. (Conference paper published by the American Diabetes Association, USA in its 2018 meeting)
18. C. Malick, S.K. Chatterjee, S. Bhattacharya, V. R. Suresh, R. Kundu and S.K. Saikia. Structural organization of the olfactory organ in an amphihaline migratory fish Hilsa, *Tenualosailisha*. *Microscopy Research and Technique* 81(5), 2018.
19. Malick, S.K. Chatterjee, S. Bhattacharya, V.R. Suresh, R. Kundu, S.K. Saikia. Evidence of putative sensory receptors from snout and tongue in an upstream amphihaline migratory fish hilsa *Tenualosailisha*. *Ichthyological Research* 65:42-55, 2017.
20. Mukhuty, C. Fouzder, S. Mukherjee, C. Malick, S. Mukhopadhyay, S. Bhattacharya, R. Kundu. Palmitate induced Fetuin-A secretion from pancreatic  $\beta$ -cells adversely affects its function and elicits inflammation. *Biochemical Biophysical Research Communication* 491: 1118-1124, 2017.
21. S. Das, Md. N. Alam, S. Batuta, G. Ahamed, C. Fouzder, R. Kundu, D. Mandal, N. A. Begum. Exploring the efficacy of *Basella alba* mucilage towards the encapsulation of the hydrophobic antioxidants for their better performance. *Process Biochemistry* 61C: 178-188, 2017.
22. S. Das, S. Batuta, Md. N. Alam, C. Fouzder, R. Kundu, D. Mandal, N. A. Begum. Antioxidant flavone analog functionalized fluorescent silica nanoparticles: Synthesis and exploration of their possible use as biomolecule sensor. *Colloids and Surfaces B*. 157: 286-296, 2017.
23. P. Chatterjee, S. Seal, S. Mukherjee, R. Kundu, M. Bhuyan, N. C. Barua, P. K. Baruah, S. P. Sinha Babu and S. Bhattacharya. A carbazole alkaloid deactivates mTOR through the suppression of rictor and that induces apoptosis in lung cancer cells. *Molecular and Cellular Biochemistry* 405: 149-158, 2015.

24. S. Chatterjee, A. Ray, S. Mukherjee, S. Agarwal, R. Kundu, S. Bhattacharya. Low concentration of mercury induces autophagic cell death in rat hepatocytes. *Toxicology and Industrial Health* 30(7): 611-620, 2014
25. P. Chatterjee, S. Seal, S. Mukherjee, R. Kundu, S. Mukherjee, S. Ray, S. Mukhopadhyay, S.S. Majumdar and S. Bhattacharya. Adipocyte fetuin-A contributes to and their polarization macrophage migration into adipose tissue. *Journal of Biological Chemistry* 288: 28324-28330, 2013.
26. S. Seal, P. Chatterjee, S. Bhattacharya, D. Pal, S. Dasgupta, R. Kundu, S. Bhattacharya, M. Bhuyan, P. R. Bhattacharyya, G. Baishya, N. C. Barua, P. K. Barua, P. G. Rao and S. Bhattacharya. Vapor of volatile oils from *Litsea cubeba* seed induces apoptosis and causes cell cycle arrest in lung cancer cells. *PLoS One* 7(10): e47014, 2012.
27. Pal, S. Dasgupta, R. Kundu, S. Maitra, S. S. Majumder, S. Mukhopadhyay, S. Ray, G. Das, S. Bhattacharya. Fetuin-A acts as an endogenous ligand of TLR4 to promote lipid-induced insulin resistance. *Nature Medicine* 18(8): 1279-1285, 2012.
28. S. Bhattacharya, R. Kundu, S. Dasgupta, S. Bhattacharya. Mechanism of lipid induced insulin resistance: An overview. *Endocrinology Metabolism* 27(1): 12-19, 2012.
29. R. Kundu, S. Dasgupta, A. Biswas, S. Bhattacharya, B.C. Pal, Sh. Bhattacharya, P.G. Rao, N.C. Barua and S. Bhattacharya. Carlinoside decreases liver bilirubin accumulation by augmenting UGT1A1 expression by inducing Nrf2 gene expression. *Biochemical Pharmacology* 82: 1186-1197, 2011.
30. Biswas, S. Bhattacharya, S. Dasgupta, R. Kundu, S.S. Roy, B.C. Pal and S. Bhattacharya. Insulin resistance due to lipid induced signaling defects could be prevented by mahanine. *Molecular and Cellular Biochemistry* 336: 97-107, 2010.
31. P. Burma, S. Bhattacharya, A. Bhattacharya, R. Kundu, S. Dasgupta, A. Biswas, S.S. Roy, Sh. Bhattacharya and S. Bhattacharya. FFA induced overexpression of NF- $\kappa$ B in skeletal muscle cells is linked to insulin resistance. *BBA-Molecular Basis of Disease* 1792: 190-200, 2009.
32. R. Kundu, S. Dasgupta, A. Biswas, A. Bhattacharya, B.C. Pal, D. Bandyopadhyay, Sh. Bhattacharya and S. Bhattacharya. *Cajanus cajan* Linn. (Leguminosae) prevents alcohol induced rat liver damage and augments cytoprotective function. *Journal of Ethnopharmacology* 118: 440-447, 2008.

**Projects (Sanctioned/Ongoing):**

| Title of the project and Reference number  | Duration               | Cost (lakhs) | Funding Agency | Remarks   |
|--|------------------------|--------------|----------------|-----------|
| PI: Dr. Rakesh Kundu, "To investigate the role of Fetuin-A in lipotoxicity induced beta-cell dysfunction and inflammatory injury to the pancreatic islets", DST-SERB, Govt. of INDIA, Ref. No. ECR/2017/001028 | Approved on 29.05.2017 | Rs. 42.10186 | DST-SERB       | Ongoing   |
| PI: Dr. Rakesh Kundu, "Understanding the role of Nrf2-Keap1 pathway in developing drug resistance in lung cancer cells"<br>Ref. UGC-FRPS Research Start-Up-Grant   | 2014-2016              | Rs. 6.0      | UGC            | Completed |
| Co-Investigator in the project entitled, "Stock Characterization, captive breeding, seed production and culture of Hilsa ( <i>Tenualosailisha</i> )", ICAR, Govt. of INDIA, Ref. No. NFBSFARA/3021/2012-13     | 2012-2017              | Rs. 159.00   | ICAR           | Completed |

### **Detail of patents:**

1. Synergistic pharmaceutical composition useful for the treatment of lung cancer. M. Bhuyan, P. R. Bhattacharyya, P. K. Baruah, N. C. Barua, P. G. Rao, S. Bhattacharya, **R. Kundu**, P. Chatterjee, S. Seal, S. Mukharjee, S. Dasgupta, S. Maitra, S. Bhattacharya, S. Bhattacharya. 9622987, Application No. 14/410,844, Award date 18/04/2017, US Patent.
2. UDP-Glucuronosyl transferase (UGT) expression stimulant to reduce bilirubin accumulation in liver and pharmaceutical compositions thereof. **R. Kundu**, S. Dasgupta, A. Biswas, B. C. Pal, S. Bhattacharya, S. Bhattacharya, N. C. Barua, P. G. Rao. (0136DEL2010, 2010), INDIA.
3. Mahanine arrests growth and induces apoptotic death of lung cancer cells by targeting mTORC1 and mTORC2 complexes. Bhuyan, M; Barua, NC; Baruah, PK and Rao, PG, Chatterjee, P; Seal, S; **Kundu, R**; Mukherjee, S; Bhattacharya, S. (0275NF2013, 2013), INDIA.

### **Member of Society and Reviewers:**

- Member of Endocrine Society (ENDO), USA (2017, 2018)
- Indian Science Congress Association, Kolkata, India (ISCA)
- Society of Biological Chemists, Bangalore, India (SBC)
- Society for Reproductive Biology and Comparative Endocrinology, India (SRBCE)
- Reviewer of the projects from DST-SERB, Govt. of INDIA
- **Guest Editor** – Frontiers in Mol Med
- Reviewer of the Journal PLoS ONE, Mol Cell Endocrinol (Elsevier), Archives of Biochem Biophys (Elsevier), Clin Exp Pharmacol Physiol (Wiley), Lett Drug Des Discov (Bentham Sc.), Experimental and Therapeutic Medicine, International Journal of Molecular Medicine (Spandidos), Cancer Biotherapy and Radiopharmaceuticals, Oncology Letters (Spandidos), Oncology Reports (Spandidos), Toxicology and Industrial Health (SAGE).