

Dr. Raj Kumar Duary

Assistant Professor (Grade II),
Dept of Food Engineering and Technology,
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➤ Google Scholar: https://scholar.google.co.in/citations?hl=en&user=I4_XosAAAAAJ

➤ Research Gate: https://www.researchgate.net/profile/Raj_Kumar_Duary

Work Experience

Presently, working as **Assistant Professor** in **Food Engineering and Technology Department**, Tezpur University (Central University) since July, 2010 (**10 years, 0 months**).

Courses Taught

B.Tech. student

Food Analysis (FP 403); Basic & Food Microbiology (FP 202); Dairy Product Technology (FP 309); Food Biochemistry and Nutrition (FT 205); Food and Nutrition (FT 400); Fermented and Non-fermented Beverages (FT 425)

Int. M.Tech student

Basic microbiology and Food Microbiology (FP 422); Fermentation and Process control (FP 412); Food Chemistry (FT 201); Technology of Milk and Milk Products (FP 418); Basic & Food Microbiology (FT 202); Food Biotechnology (FT 417); Microbiology (BT 404); Food Analysis (FP 403)

M.Tech student:

Food Biotechnology (FT 417); Technology of Milk and Milk Products (FP 408); Fermentation and Process control (FP 412), Food Biotechnology (FT 527); Industrial Microbiology and Biotechnology (FT 528), Fermented and non-fermented beverages (FT-529); Recent Trends in Fermentation Technology (FT549)

PhD. student:

Advanced Food Technology (FP 701), Advanced Analytical Techniques (FP 702)

ACADEMIA

- Ph.D (Dairy Microbiology) from National Dairy Research Institute (Deemed university), Karnal, Haryana (2010)
- M. Sc (Dairy Microbiology) from National Dairy Research Institute, Karnal, Haryana; National Dairy Research Institute (Deemed university), Karnal with 7.2/ 10 OGPA (2004-2006)
- B.Tech (Dairy Technology), Faculty of Dairy Technology, West Bengal University of Animal and Fishery Sciences, West Bengal with 77.8 % (2000-2004)

EXTERNAL FUNDED PROJECTS

➤ PI-

1. **"Designing bioactive peptides from whey liquid waste of the dairy industry: Functionality and health benefit in Obesity, Obesity associated disorders with exploration of molecular mechanism"** Under **Twining projects for the NE - 2015 Agri/2015/62**. Amounting: **Rs. 54.55 lakhs [BT/PR16828/NER/95/307/2015 dated October 18, 2016]**, Department of Biotechnology, Ministry of Science & Technology, Govt. of India.
2. **"Establishment and evaluation of probiotics potentiality of isolated lactobacilli strains and comparative analysis of their gene expression profile during transit in a simulated gastrointestinal tract conditions."** under DST-SERB "Empowerment and Equity Opportunities

for Excellence in Science-2014” programme. [SB/EMEQ-361/2014 dated 10-03-2016]. Amount: **Rs. 11.00 lakhs. Science & Engineering Research Board- Deptment of Science and Technology (SERB-DST), Govt. of India.**

3. **“Comparative metagenome of human gut of North and North-eastern region of India”** Under **Twinning projects for the NE – 2013**. [Letter No. MED/2013/199 **Twinning 2013-14 (Medical)**]. Amount: **Rs. 64.15 lakhs**, Department of Biotechnology, Ministry of Science & Technology, Govt. of India.
4. **“Encapsulation and controlled delivery of herbal extracts in dairy food matrix using cow milk protein against in vitro simulated inflammatory cell line models”** Under **Start Up Research Grant (Young Scientists)**. [Registration No. **SERB/LS-2/2014**, Dated: **28 March, 2014**] **Science & Engineering Research Board- Deptment of Science and Technology (SERB-DST), Govt. of India.** Amount: **Rs. 19.70 lakhs.**
5. **Start-up Grant** from Tezpur University, **2011-12: Rs. 1.5 lakhs**

➤ **Co-PI:**

6. **“Value addition of banana (*Musa. sp*) and creating small scale enterprises of Meghalaya tribal community though minimal processing technology”** funded by DBT GoI, for implementation of network project under ‘**DBT’s NER-Banana Program for NE**’ [File no. **DBT-NER/AGRI/33/2016 (Group-6)** dated 22-03-2018]. Amount: **Rs. 71.85 lakhs**
7. **“Studies on functional properties of the dominant microflora found in rice beer of Assam”**. Funded by: **Ministry of Food Processing Industries (MoFPI), Govt. of India, New Delhi**. [File No. **97/MFPI/R&D/2012** dated 18th Feb-2013]. Amount: **Rs. 46.02 lakhs.**
8. **“Quality improvement of a traditional probiotic beverage of North-East India as combat food”** Funded by: **Directorate of Extramural Research & Intellectual Property Rights (ER&IPR), Defence Research and Development Organisation (DRDO), Govt. of India** [File No. **ERIP/ER/1203059/ M/0/15111** Dated 28th January, 2014] Amount: **Rs 18.30 lakhs.**

RESEARCH PURVIEW

Ph. D Research Project

Title : **Modulation of gene expression by probiotic lactobacilli under simulated *in vitro* gut Environment** (2006-2010)

During M. Sc. Research Project

Title : **DNA fingerprinting of indigenous probiotic lactobacilli** (Jan-June, 2006 (6 months))

Editorial Board Member

1. International Journal of Drug Design and Development (International Peer Reviewed Open Access journal- SM Groups)
2. Journal of Nutrition and Dietetics (Open Access- OMICS International)

Reviewer

1. Bioresource Technology (Elsevier)
2. Food Chemistry (Elsevier)
3. LWT - Food Science and Technology (Elsevier)
4. International Journal of Biological Macromolecules (Elsevier)
5. BMC Complementary and Alternative Medicine (BioMed Central)
6. Journal of Food Biochemistry (Wiley)
7. Immunome Research- open access (OMICS International - Open Access Publisher)

Ph.D STUDENTS GUIDING

1. **Mr. Pallab Kumar Borah (FPP15107) – Submitted : Strategic design and characterization of biocompatible nutraceutical delivery system for colorectal cancer therapy (Submitted)**
2. **Miss. Lopamudra Sarma (FPP14103) – pursuing: Encapsulation and controlled delivery of herbal extracts for treatment of IBD using cow milk protein against in vitro simulated inflammatory cell line models**
3. **Miss Priti Sarkar (FPP15105) – pursuing: Bioactive peptides from *Philosomia ricini* and *Antheraea assama* (Silkworm): Functionality along with health promoting study under in vitro and in silico hypertensive model**
4. **Miss. Nemnunhol Haokip (FPP16001)- pursuing: Characterization of some medicinally valued plants found in Manipur and formulation of herbal drink**

M. TECH STUDENTS GUIDED

Nos. = 20

1. Miss **Rupsa Roychowdhury**: Screening, Production & Characterization of EPS K1^T-9 from Marine Bacteria *Neorhizobium urealyticum* K1^T sp. Nov (2019-2020)
2. Miss **Khumbaron Kiranbala Kabui**: Study on antimicrobial biodegradable film from gum of flaxseed (*Linum usitatissimum* L.) (2019-2020)
3. **Miss Parmita Gogoi**: Conjugation of Cellulose Nanofibres (Banana Peel) and Soy Protein Hydrolysates in Development of Pickering Emulsion Based Encapsulating System (2017-18)
4. **Ms. Pushpanjali Rajak**: Characterization and development of functional pasta using mahua (2017-18)
5. **Mr. Arin Kumar**: Design and development of smartphone based Photometric sensor for detection of Urea adulteration in milk (2016-17)
6. **Mr. Pramod Kumar**: Comparative study on detection of detergents as a milk adulterant using colorimetric, spectroscopic and android based smartphone apps (2016-17)
7. **Ms. Boristha Goswami**: *In silico* and *in vitro* study on anti-oxidative properties of bioactive peptides protein derived from silkworm (*Samia ricini*) (2016-17)
8. **Ms. Sangita Saikia**: Study on *in silico* dynamics, slow digestibility and molecular structure of gallic acid functionalized starch (2015-16)
9. **Ms. Smaranika Baishya**: Study on functional properties of phytocomposites extracted from *Terminalia chebula* and its encapsulation in niosomes (2015-16)
10. **Mr. Pallab Kr. Borah**: Cold black tea infusion assisted oral delivery of pH regulated Nano quercetin for ADAM17 downregulation in Inflammatory bowel disease model (2014-15)
11. **Miss. Priyanka Hazarika**: Optimization and quality assessment of soymilk-fortified paneer prepared by admixing buffalo milk and cow milk (2014-15)
12. **Mr. Sanjit Majumdar**: Optimized Apple shake Formulation consisting of honey and encapsulated L. rhamnosus ATCC 1408 (2014-15)

13. **Miss. Prerana Bora:** Physio-chemical and bio-functional properties of ready-to-serve (RTS) herbal aloe vera drink (2013-2014).
14. **Miss. Niharika Kashyap:** Formulation of low-gluten bread enriched with edible mushroom powder (2013-2014).
15. **Miss. Sangita Borah:** Formulation of low-fat flavored probiotic yoghurt consisting water chestnut starch as biothickner (2012-2013).
16. **Miss. Tridisha Kakoty:** Study of physiochemical properties of water chestnut starch incorporated biodegradable film and their role in shelf life of coated ripened tomatoes (2012-2013).
17. **Miss. Namita Medhi:** Formulation of sponge cake enriched with hydrothermally modified resistant corn starch and *Pleurotus ostreatus* polysaccharides (2011-2012).
18. **Miss. Biplabi Chamuah:** Functional attributes of formulated antidiabetic kalakand with *Caesalpinia bonducella* seeds and *Centella asiatica* leaves extract (2011-2012).
19. **Miss. Sananda Choudhury:** Fortification of encapsulated form of omega-3 fatty acid recovered from fish waste in yoghurt (2011-2012).
20. **Mr. Kishor Devanna Aitwar:** Proximate analysis of raw and cooked leafy vegetables available in Assam (2011-2012).

B. TECH STUDENTS GUIDED

Nos. = 09

1. **Miss Ekita Devi (2019-20):** Spiced tofu and its characterization
2. **Miss Nurin Afzia (2019-20):** Spiced tofu and its characterization
3. **Miss Sneha K Prakash (2017-18):** Development and characterization of ready-to-eat sweet papaya cubes using heat enzyme interventions
4. **Mr. Ashim Nath (2017-18):** Development and characterization of ready-to-eat sweet papaya cubes using heat enzyme interventions
5. **Miss. Surabhi Dubey (2016-2017):** Study on physico-chemical properties of fermented rice muffins formulated with sugar and fat replacer.
6. **Mr. Brighuranjan Sonowal (2016-2017):** Study on physico-chemical properties of fermented rice muffins formulated with sugar and fat replacer.
7. **Miss Tapashree Das (2015-2016):** Implementation of an optical biosensor and fabrication of a potentiometric biosensing system for detection and quantification of urea in milk
8. **Miss. Trishula Das (2015-2016):** Implementation of an optical biosensor and fabrication of a potentiometric biosensing system for detection and quantification of urea in milk
9. **Miss Chayanika Saha (2014-2015):** Study on formulation of cow milk yoghurt fortified with oat and soy milk.

INDUSTRIAL TRAINING EXPOSURE

- Done **6-months** (Jan'04–June'04) in-plant training in MilkFed, Verka, Mohali, Punjab, India during B.Tech course.
- **3 and half-month** (Feb'03-June'03) in-plant training in Haringatha Dudhagarh, Mohanpur, Govt. of West Bengal, India.
- **7 days** training in SRS-Bangalore (NDRI), India.

PUBLICATION

Original research paper (International and National):

1. Borah, P. K., Das, A. S., Mukhopadhyay, R., Sarkar A., **Duary, R. K. 2020.** Macromolecular design of folic acid functionalized amylopectin- albumin core-shell nanogels for improved physiological stability and colon cancer cell targeted delivery of curcumin. *Journal of Colloid and Interface Science.* (In Press). <https://doi.org/10.1016/j.jcis.2020.07.056> (**Impact Factor: 7.489**)
2. Gautam, G., **Duary, R.K.**, Gupta, K., Mahanta, C.L. **2020.** Inhibition mechanism of 3-hydroxy, 3-methyl glutaryl CoA reductase by tocotrienol-rich rice bran fraction optimally extracted with ultrasonic energy. *International Journal of Biological Macromolecules* (Accepted, In Press) <https://doi.org/10.1016/j.ijbiomac.2020.07.196> (**Impact Factor: 5.162**)
3. Das, A. S., Basu, A., Kumar, R., Borah, P. K., Bakshi, S., Sharma, M., **Duary, R. K.**, Ray, P. S., Mukhopadhyay, R. **2020.** Post-transcriptional regulation of C-C motif chemokine ligand 2 expression by ribosomal protein L22 during LPS-mediated inflammation. *The FEBS Journal.* DOI:10.1111/FEBS.15362 (**Impact Factor: 4.392**)
4. Borah, P.K., Sarkar A., **Duary, R. K., 2019.** Water-soluble vitamins for controlling starch digestion: Conformational scrambling and inhibition mechanism of human pancreatic α -amylase by ascorbic acid and folic acid. *Food Chemistry*, 288: 395-404. (doi.org/10.1016/j.foodchem.2019.03.022 (**Impact Factor: 6.306**))
5. Borah, P.K., Rappolt M., **Duary, R. K.***, Sarkar A* (***Joint Corresponding Author**). **2019.** Structurally induced modulation of in vitro digestibility of amylopectin corn starch upon esterification with folic acid. *International Journal of Biological Macromolecules* 129: 361-369. (**Impact Factor: 5.162**) DOI: 10.1016/j.ijbiomac.2019.02.051.
6. Sarma, L., Chakraborty, S., Das, M.J., **Duary, RK. 2018.** Optimization of ultrasound-assisted extraction of phenolic compounds from *Sesamum indicum*. *Natural Product Research*, 34 (13): 1931–1936. (**Impact Factor: 2.158**). <https://doi.org/10.1080/14786419.2018.1564294>
7. Sarma, L., Chakraborty, S., **Duary, RK. 2018.** Solvent-based microwave-assisted extraction and identification of bioactive compounds from *Sesamum indicum* leaves using particle swarm optimization-integrated response surface methodology. *Pharmacognosy Magazine*, 14(57) (Supplement 2): S275-S283. https://doi.org/10.4103/pm.pm_570_17 (**Impact Factor: 1.310**).
8. Borah, P.K., Rappolt M., **Duary, R. K.**, Sarkar A. **2018.** Effects of folic acid esterification on the hierarchical structure of amylopectin corn starch. *Food Hydrocolloids*, 86: 162-171. doi: 10.1016/j.foodhyd.2018.03.028 (**Impact Factor: 7.053**).
9. Patra, F., **Duary, R.K.**, Ganguly, S., Das, A. **2017.** Engineered Probiotics and Pharmabiotics: application in therapeutics and prophylaxis. *Indian Journal of Dairy Science*, 70(2): 137-144. doi: 10.5146/ijds.v70i2.49168.g29514. (**NAAS Rating: 5.26**) (ISSN: 2454-2172 (online); 0019-5146 (Print))
10. Borah, P. K., Deka, S. C., **Duary, R.K. 2016.** Effect of repeated cycled crystallization on digestibility and molecular structure of glutinous Bora rice starch. *Food Chemistry*, 223: 31–39. doi:10.1016/j.foodchem.2016.12.022 (**Impact Factor: 6.306**)

11. Borah, P. K., Chakraborty, S., Jha, A. N., Rajkhowa, S., **Duary, R.K. 2016.** *In silico* approaches and proportional odds model towards identifying selective ADAM17 inhibitors from anti-inflammatory natural molecules. *Journal of Molecular Graphics and Modelling*, 70 (2016): 129–139. doi:10.1016/j.jmgm.2016.10.003. **(Impact Factor: 2.079)**.
12. Patra, F., Tomar, S. K., **Duary, R.K.**, Singh, R. **2015.** Response surface optimization of the substrate concentration and cultivation conditions for the production of mannitol by *Leuconostoc fallax* Ln92 using whey as cost effective medium. *Indian Journal of Dairy Science*, 69(2): 165-170. **(NAAS Rating: 5.26)** (ISSN: 2454-2172 (online); 0019-5146 (Print))
13. **Duary, R. K.**, Batish, V. K. and Grover, S. **2014.** Immunomodulatory activity of two potential probiotic strains in LPS-stimulated HT-29 cells. *Genes & Nutrition*, 9(3):398. doi: 10.1007/s12263-014-0398-2. **(Impact Factor: 4.258)**.
14. Chauhan, R., Aparna Sudhakaran V, Panwar, H., Mallapa, R. H., **Duary, R. K.**, Batish, V. K. and Grover, S. **2014.** Amelioration of colitis in mouse model by exploring antioxidative potentials of an indigenous probiotic strain of *Lactobacillus fermentum* Lf1. *BioMed Research International*, Volume 2014, Article ID 206732. <http://dx.doi.org/10.1155/2014/206732> **(Impact Factor: 2.276)**.
15. Aparna Sudhakaran V., Panwar, H., Chauhan, R., **Duary, R.K.**, Rathore, R.K., Batish, V.K., Grover, S. **2013.** Modulation of anti-inflammatory response in lipopolysaccharide stimulated human THP-1 cell line and mouse model at gene expression level with indigenous putative probiotic lactobacilli. *Genes & Nutrition* **8(6)**:637-648. doi: 10.1007/s12263-013-0347-5. **(Impact Factor: 4.258)**.
16. Chandran, A., **Duary, R. K.**, Grover, S. and Batish, V. K. **2013.** Relative expression of bacterial and host specific genes associated with probiotic survival and viability in the mice gut fed with *Lactobacillus plantarum* Lp91. *Microbiological Research* **168(9)**:555–562. **(Impact Factor: 3.970)**.
17. Bhattacharya, S.S., Barman, S., Ghosh, R., **Duary, R.K.**, Goswami, L. and Mandal, N.C. **2013.** Phosphate solubilizing ability of *Emericella nidulans* strain V1 isolated from vermicompost. *Indian Journal of Experimental Biology*, **51**: 840-848. **(Impact Factor: 0.783)**.
18. Achuthan, A. A., **Duary, R. K.**, Anupama, M., Panwar, H., Kumar, H., Batish, V. K. and Grover, S. **2012.** Antioxidative potential of indigenous lactobacilli isolated from the gut of Indian people. *Molecular Biology Reports*, **39 (8)**, 7887-7897. DOI: 10.1007/s11033-012-1633-9 **(Impact Factor: 1.402)**.
19. **Duary, R. K.**, Bhausahab. M. A., Batish, V. K. and Grover, S. **2012.** Anti-inflammatory and immunomodulatory efficacy of indigenous probiotic *Lactobacillus plantarum* Lp91 in colitis mouse model. *Molecular Biology Reports*, **39 (4)**, 4765-4775, DOI: 10.1007/s11033-011-1269-1 **(Impact Factor: 1.402)**.
20. Rashmi, H. M, Rokana, N., **Duary, R. K.**, Panwar, H., Batish, V. K. and Grover, S. **2012.** Management of metabolic syndrome through probiotic and prebiotic interventions. *Indian Journal of Endocrinology and Metabolism*, **16(1)**: 20-27.
21. **Duary, R. K.**, Batish, V. K. and Grover, S. **2011.** Relative gene expression of bile salt hydrolase and surface proteins in two putative indigenous *Lactobacillus plantarum* strains under *in vitro* gut conditions. *Molecular Biology Reports*, **39(3)**:2541-2552. DOI: 10.1007/s11033-011-1006-9. **(Impact Factor: 1.402)**.
22. **Duary, R. K.**, Rajput, Y.S., Batish, V. K. and Grover, S. **2011.** Assessing the adhesion of putative indigenous probiotic lactobacilli to human colonic epithelial cells. *Indian Journal of Medical Research*, 134: 664-671. **(Impact Factor: 1.503)**.

- 23. Duary, R. K.**, Batish, V. K. and Grover, S. **2010**. Expression of *atpD* gene in putative indigenous probiotic *L. plantarum* strains under *in vitro* acidic conditions by RT-qPCR. *Research in Microbiology*, 161(5):399-405. doi:10.1016/j.resmic.2010.03.012 (**Impact Factor: 3.217**).
- 24.** Kaushik, J. K., Kumar, A., **Duary, R. K.**, Mohanty, A. K., Grover, S. and Batish, V. K. **2009**. Functional and probiotic attributes of an indigenous isolate of *Lactobacillus plantarum*. *PLoS ONE* **4(12)**: e8099. doi:10.1371/journal.pone.0008099. (**Impact Factor: 2.740**).
- 25. Duary, R. K.**, Grover, S., Mohanty, A. K., Kaushik, J. K. and Batish, V. K. **2009**. Randomly amplified polymorphic DNA profiles of *Lactobacillus* isolates from human faecal samples. *International Journal of Probiotics and Prebiotics*, **4(1)**: 55-64. http://www.nchpjournals.com/manuscript/uploads/article_786.pdf
- 26. Duary, R. K.**, Grover, S., and Batish, V. K. **2009**. Probiotics- a magic bullet. *Indian Dairyman*, **61(8)**: 22-32.

Chapter in Book/booklet:

- Pallab Kumar Borah and **Raj Kumar Duary**. **2020**. Molecular recognition, selective targeting, and overcoming gastrointestinal digestion by folic acid functionalized oral delivery systems in colon cancer. *In: Encapsulation of Active Molecules and their Delivery System*. Eds: Dr. Shirish H. Sonawane, Dr. Bharat A. Bhanvase, and Dr. Manickam Sivakuma. Elsevier, Amsterdam, The Netherlands. Pp 233-255. DOI: <https://doi.org/10.1016/B978-0-12-819363-1.00014-4>
- Falguni Patra and **Raj Kumar Duary**. **2020**. Waste from dairy processing industries and its sustainable utilization. *In: Sustainable Food Waste Management - Concepts and Innovations*. Eds: Dr. Monika Thakur, Prof. V.K. Modi, Dr. Renu Khedkar and Dr. Karuna Singh. Springer Nature, Singapore 189721, Singapore. (*In Press*).
- **Duary, R.K.** and Patra F. **2018**. Bioactive Peptides from Milk: Functionality and Health benefit in disease management. *In: Innovation in Food Processing Technology*. Eds: Sit, N., Badwaik, L.S. and Das, A.B. New India Publishing Agency (NIPA), India, pp-65-80. (ISBN: 9789386546517)
- Grover, S., **Duary, R. K.** and Batish, V. K. **2011**. Genomics based biomarkers for probiotic functionality. *In: Functional Dairy Foods: concepts and application*. Eds: Tomar et al. Satish Serial Publishing House, India, pp- 191-196 (ISBN: 8189304909).
- Grover, S., **Duary, R. K.** and Batish, V. K. **2008**. Genomics based biomarkers for probiotic functionality. *Advances in Microbiology, Chemistry and Technology of dairy functional foods and nutraceuticals*, 137-139.

Conference Proceedings

- **Duary, R.K.** **2015**. Dietary interventions on gut microbiome-a metagenomics study. Conference proceeding: National conference cum workshop organizing organized by the Food Engineering and Technology Dept, Tezpur University, 27 to 28th March, 2015 on "**Innovative prospects in food processing: integration of engineering and biological sciences**" IPFP-2015, pp. 154-170, Ticol Style Tracker Publisher (ISBN No: 978-93-84388-06-5).

NCBI Accession numbers:

- **GQ337858.1**: *Lactobacillus plantarum* strain Lp9 16S ribosomal RNA gene, partial sequence
- **JX112704**: *Emericella nidulans* strain V1 beta-tubulin (beta-tubulin) gene, partial cds.

Presentation:

- Invited as **Resource Person** in National Training on "Emerging trends in Bio-process Technology in Dairy and Food Processing" at the Dairy Technology Division, NDRI (Karnal) from during **January 15- February 4, 2020**. Topic of Lecture 1.Milk based delivery interventions on gut microbiome affecting human health and 2. A concept of insect protein

- **Oral Presentation** on "Milk based dietary interventions on gut microbiome affecting human health". At National Symposium on "Probiotics and Functional Foods on Health Management" PFFHeM2019; Date: 4th to 5th March, 2019 held at Department of Food Engineering and Technology, Tezpur University.
- **Invited Oral Presentation** on "Bioactive peptides: Functionality and health benefit in Obesity, Obesity associated disorders" at International Conference entitled "Technological Innovations for Integration of Food and Health (TiiFH 2019): A focus on North-Eastern India" February 14 and 16, 2019 at the Tezpur University.
- Oral Presentation on "**Bioactive Peptides from milk: Functionality and Health Benefit in Disease Management.**" At National Conference on Trends and Innovation in Food Processing: Prospects and Challenges, TIFPT **2017**, 9th to 10th February, 2017 held at Department of Food Engineering and Technology, Tezpur University.
- Delivered a **lecture on "Milk based dietary interventions on gut microbiome affecting human health"** under the theme "Functional Dairy Foods for Better Health" organized at Faculty of Dairy Technology, WBUAFSc, Mohanpur Campus, nadia, West Bengal on 24th September, 2017.
- Oral presentation on "**Gallic acid functionalized starch: in silico studies against alpha amylase, slow digestibility, molecular structure and antioxidant activity**" at International Conference on Emerging Technologies in Agricultural and Food Engineering (ETAE2016) held at IIT, Kharagpur from 27th to 30th December, 2016.
- Oral presentation on "**Dietary interventions of Gut microbiome-a metagenomics.**" in National conference cum workshop organizing organized by the Food Engineering and Technology Dept, Tezpur University, 27 to 28th March, 2015 on "**Innovative prospects in food processing: integration of engineering and biological sciences**".
- **As invite candidate** for poster presentation "**Immunomodulating and antioxidative potentials of indigenous probiotic Lactobacilli for amelioration of colitis in in vitro and in vivo models**" in International Symposium on "**Probiotics, Microbiome and Gut Function– Transforming Health and Well-being**" on 15th and 16th February 2014 at the Intercontinental Eros Hotel, Nehru Place, New Delhi, India organized by Yakult India Microbiota and Probiotic Science Foundation in association with the Translational Health Science and Technology Institute, Gurgaon and Apollo Hospitals.
- Oral presentation on "**Characterization and evaluation of indigenous probiotic lactobacilli strain from human feces against inflammatory disorders**" at **UGC-SAP National Seminar** on Recent Advances in Microbial Biotechnology and Molecular Evaluation to be held from 1-2 March, 2013 at Tezpur University.
- Oral presentation on "**Potentiality of two promising putative indigenous strains of probiotic lactobacilli against inflammatory disorders**" at 1st Annual Conference along with An International Symposium on **Probiotics for Human Health-New Innovations and Emerging Trends**, from August 27-28, 2012, At Habitat World at India, Habitat Centre, Lodhi Road, New Delhi, India.
- Oral presentation on "**Probiotic Lactobacilli as a potential candidate to cure metabolic inflammatory disorder**" in 18th International Conference 2012 on "**Perspective and Challenges in Chemical and Biological Sciences**", Gauhati, India from 28th to 30th January, 2012.
- Oral presentation on "**Assessing anti-inflammatory role of two putative strains of probiotic lactobacilli in HT-29 cells by RT-qPCR.**" in International conference organized by World Diabetes Congress Dubai 2011 in Dubai, UAE from 04-08 December 2011 (Fully Sponsored by the organizer).
- Oral presentation on "**Anti-inflammatory and immunomodulatory efficacy of indigenous probiotic Lactobacillus plantarum both under in vitro and in vivo model.**" in National conference on "Role of

Bioactive Compounds in Foods on Human Health (BIOFOODS2011)" organizing organized by the Food Engineering and Technology Dept, Tezpur University, 14-16 Nov **2011**.

- Poster presentation on "**Identification of promising probiotic Lactobacilli by PCR and RAPD (Randomly amplified polymorphic DNA) banding patterns**" in 48th Annual Conference, Association of Microbiologist of India (AMI) from December 2007 organized by Indian Institute of Technology(IIT), Chennai ,India.

Abstract:

- 1) Rashmi H M, **Raj Kumar Duary**, Preeti Sarkar, Devendra Kumar Singh, Arindam Maitra and Sunita Grover. Comparative Analysis of Gut microbiome of North Indian and North-East Indian Vegetarian and Non-Vegetarian population of different age groups. At 9th India Probiotic Symposium, Amity University, Kolkata during 24th-25th Nov. **2018**.
- 2) Borah, P. K., Sarkar, A., **Duary, R.K.** (2018) "Inhibition of pancreatic α -amylase by water-soluble vitamins" in International Conference on Recent Advances in Food Processing Technology iCRAFPT, Indian Institute of Food Processing Technology, India August 17-19th, 2018.
- 3) Lopamudra Sarma, Sourav Chakraborty and **Raj Kumar Duary. 2018**. Application of Taguchi integrated RSM methodology for solvent based microwave assisted extraction of anti-oxidative bioactive molecules from *Sesamum indicum* (Sesame) leaves. At Indo-Japan Bilateral Symposium on "Future perspective of Bioresource utilization in North-East India" held at IIT-Guwahati during 1st-4th February, 2018.
- 4) Preeti Sarkar and **Raj Kumar Duary. 2018**. Antioxidant and ACE inhibitory bioactive peptides from *Philosomia ricini* (Silkworm) using ultrasound assisted enzyme hydrolysis along with *in silico* analysis. At Indo-Japan Bilateral Symposium on "Future perspective of Bioresource utilization in North-East India" held at IIT-Guwahati during 1st-4th February, 2018.
- 5) Nemnunhoi Haokip and **Raj Kumar Duary. 2018**. Ethanomedicinal plants used by the Thadou-Kuki tribe of Churachandpur district, Manipur. At Indo-Japan Bilateral Symposium on "Future perspective of Bioresource utilization in North-East India" held at IIT-Guwahati during 1st-4th February, 2018.
- 6) Pallab Kumar Borah, Michael Rappolt, **Raj Kumar Duary** and Anwasha Sarkar. Modulating molecular and structural arrangement of starch for controlled digestion using vitamins. In International conference: "19th Gums & Stabilisers for the Food Industry Conference" held on June, 2017 at Berlin, Germany.
- 7) **Raj Kumar Duary. 2017**. Bioactive Peptides from milk: Functionality and Health Benefit in Disease Management. At National Conference on Trends and Innovation in Food Processing: Prospects and Challenges, TIFPT **2017**, 9th to 10th February, 2017 held at Department of Food Engineering and Technology, Tezpur University.
- 8) Arin Kumar, Boristha Goswami and **Raj Kumar Duary. 2017**. Design and development of smartphone based photometric sensor for detection of urea adultration in milk. National Conference on Trends and Innovation in Food Processing: Prospects and Challenges, TIFPT **2017**, 9th to 10th February, 2017 held at Department of Food Engineering and Technology, Tezpur University.
- 9) Lopamudra Sarma and **Raj Kumar Duary. 2017**. Evaluation of total phenols and their identification with antioxidant activities of Sesame (*Sesamum indicum*) leaves extracts using solvent extraction methods. National Conference on Trends and Innovation in Food Processing: Prospects and Challenges, TIFPT **2017**, 9th to 10th February, 2017 held at Department of Food Engineering and Technology, Tezpur University.
- 10) Smaranika Baishya and **Raj Kumar Duary. 2017**. Study on functional properties of phytocomposites extracted from *Terminalia chebula* and its encapsulation in niosomes. National Conference on Trends and Innovation in Food Processing: Prospects and Challenges, TIFPT **2017**, 9th to 10th February, 2017 held at Department of Food Engineering and Technology, Tezpur University.

- 11) Sangita Saikia, Pallab Kumar Borah and **Raj Kumar Duary. 2016.** Gallic acid functionalized starch: in silico studies against alpha amylase, slow digestibility, molecular structure and antioxidant activity. International Conference on Emerging Technologies in Agricultural and Food Engineering (ETAE2016) held at IIT, Kharagpur from 27th to 30th December, 2016.
- 12) Chayanika Saha, Priyanka Hazarika and **Raj Kumar Duary. 2015.** Formulation and optimization study of oat based soymilk yoghurt using CCRD Design expert. National conference cum workshop organizing organized by the Food Engineering and Technology Dept, Tezpur University, 27 to 28th March, 2015 on "**Innovative prospects in food processing: integration of engineering and biological sciences**".
- 13) Lopamudra Sarma, Preeti Sarkar and **Raj Kumar Duary. 2015.** *In silico* inhibition studies of various fruits and medicinal plant derived polyphenol against nuclear factor NF- κ B pathway (p50 subunit) expressed during pro-inflammatory signaling pathway. National conference cum workshop organizing organized by the Food Engineering and Technology Dept, Tezpur University, 27 to 28th March, 2015 on "**Innovative prospects in food processing: integration of engineering and biological sciences**".
- 14) Sanjit Mazumdar and **Raj Kumar Duary. 2015.** Optimized formulation of synbiotic apple shake consisting honey and encapsulated *Lactobacillus rhamnosus* MTCC no. 1408 and *Lactobacillus plantarum* MTCC no 6160. National conference cum workshop organizing organized by the Food Engineering and Technology Dept, Tezpur University, 27 to 28th March, 2015 on "**Innovative prospects in food processing: integration of engineering and biological sciences**".
- 15) Sangita Borah, Tridisha Kakoty, Falguni Patra and **Raj Kumar Duary. 2015.** Formulation of low-fat flavoured probiotic yoghurt consisting water chestnut starch as biothickener. 43rd Dairy Industry Conference, Indian Dairy Association, Feb 19-21, 2015 held at Salt Lake, Kolkata, India.
- 16) **Duary RK**, Chauhan R, Mallapa RH, Batish VK, Grover S. **2014.** Immunomodulation and antioxidative potentials of indigenous probiotic lactobacilli for amelioration of colitis in in vitro and in vivo models. International Symposium on "Probiotics, Microbiome and Gut Function- Transforming Health and Well-being" on 15th and 16th February 2014 at the Intercontinental Eros Hotel, Nehru Place, New Delhi, India organized by Yakult India Microbiota and Probiotic Science Foundation in association with the Translational Health Science and Technology Institute, Gurgaon and Apollo Hospitals.
- 17) Prerana Bora, Lopamudra Sarma, **Raj Kumar Duary. 2014.** Physio-chemical and bio-functional properties of ready-to-serve (RTS) herbal aloe vera drink. National Seminar on "Recent Advances in Biotechnological Research in North East India: Challenge and Prospect" to be held from November 27th to 29th, 2014 at Tezpur University.
- 18) Medhi, N., Mahnot, N. K. and **Duary, R. K. 2013.** Study on functional attributes of polysaccharide derived from *Pleurotus ostreatus* and the formulation of sponge cake along with hydrothermally modified resistant corn starch. 7th international food convention (IFCON 2013): NSURE-healthy foods, CSIR-CFTRI, Mysore, India, 18-21 December.
- 19) **Duary RK.** Characterizing and evaluating putative indigenous probiotic lactobacilli strain from human feces against inflammatory disorders. 2nd International Conference and Exhibition on Probiotics & Functional Foods. October 23-25, 2013 Holiday Inn Orlando International Airport, Orlando, FL, USA. J Prob Health **2013**, 1:4. <http://dx.doi.org/10.4172/2329-8901.S1.013>
- 20) Borah, S., Kakoty T. and **Duary R. K. 2013.** Physiochemical properties of water chestnut starch incorporated biodegradable film. International Conference on innovations in food processing, value chain management and food safety, organized by National institute of food technology entrepreneurship and management (NIFTEM), Sonapat, Haryana, India, January 10-11.

- 21) **Duary, R. K.**, Batish, V. K. and Grover, S. **2012**. Potentiality of two promising putative indigenous strains of probiotic lactobacilli against inflammatory disorders. International Symposium, Habitat World at India, Habitat Centre, Lodhi Road, New Delhi, India, August 27-28.
- 22) **Duary, R. K.**, Batish, V. K. and Grover, S. **2011**. Assessing anti-inflammatory role of two putative strains of probiotic lactobacilli in HT-29 cells by RT-qPCR. International Conference, World Diabetes Congress in Dubai, UAE from 04-08 December 2011.
- 23) **Duary, R. K.**, Bhausaheb. M. A., Batish, V. K. and Grover, S. **2011**. Anti-inflammatory and immunomodulatory efficacy of indigenous probiotic *Lactobacillus plantarum* both under *in vitro* and *in vivo* model. National conference organizing organized by the Food Engineering and Technology Dept, Tezpur University, 14-16 Nov **2011**.
- 24) Medhi N. and **Duary, R. K.** **2011**. Resveratrol and its beneficial health effects. National conference organizing organized by the Food Engineering and Technology Dept, Tezpur University, 14-16 Nov **2011**.
- 25) Chamuah B. and **Duary, R. K.** **2011**. Anti-oxidative Potentiality of Guava (*Psidium guajava*) leaves extract. National conference organizing organized by the Food Engineering and Technology Dept, Tezpur University, 14-16 Nov **2011**.
- 26) Choudhury S. and **Duary, R. K.** **2011**. Therapeutical and functional attributes of Kiwifruit wine. National conference organizing organized by the Food Engineering and Technology Dept, Tezpur University, 14-16 Nov **2011**.
- 27) Deka, D., Kalita, D., Dutta, P., Deka, J., Deb, N. and **Duary, R. K.** **2011**. Comparative study between isoflavone content of Nutrela soya chunks and traditional fermented soybean based food called Tungrymbai. National conference organizing organized by the Food Engineering and Technology Dept, Tezpur University, 14-16 Nov **2011**.
- 28) **Duary, R. K.**, Grover, S., Mohanty, A. K. and Batish, V. K. **2007**. Identification of promising probiotic Lactobacilli by PCR and RAPD (Randomly amplified polymorphic DNA) banding patterns. 48th annual conference (Dec 18-21), Association of Microbiologists of India (AMI), Chennai.

Popular articles/magazine:

- **Duary, R. K.** **2016**. Probiosis: Influence of probiotics to restore gut ecology for human well-being. e E-Magazine in the Department of Food Technology, Gurunanak Institute of Technology, Panihati, Sodepur, Kolkata-114, W.B.

Workshops attended:

1. FDP201x: "**Pedagogy for Online and Blended Teaching-Learning Process**" conducted by IITBombayX under Pandit Madan Mohan Malaviya National Mission for Teachers and Teaching (PMMNMTT), MHRD, GoI. **During 3 May to 31 May 2018.**
2. FDP101x: "**Foundation Program in ICT for Education**" and is designed a Blended/Hybrid MOOC (Massive Open Online Course) conducted by IITBombayX under Pandit Madan Mohan Malaviya National Mission for Teachers and Teaching (PMMNMTT), MHRD, GoI. **During 08 March to 12 April 2018.**
3. **One week AICTE-NEQIP sponsored Faculty Development program** on "Advances in Food Processing Technologies" conducted by Food Engineering and Technology Department during 20-24 Nov., 2017.
4. **Two Week ISTP STTP workshop on "Environment Studies"** conducted by **IIT-Bombay** from **02 to 12 June 2015.**

5. Attended **21 days Winter school** on “**Chemical analysis of value added Dairy products and their Quality assurance**” Dairy Chemistry Division, National Dairy Research Institute, Karnal, during January 11-31, 2011.
6. **One day workshop on IPR issues** held in Tezpur University.

Other Academic Activities:

- **Member Secretary**, Tezpur University Ethical Committee, March, 2020- Till date.
- **Sr. Warden** of NMH Hostel at Tezpur University (March, 2016-Dec 2019).
- **Hon. Secretary** of AFSTi (Association of Food Scientists and Technologists, India)-Tezpur University Chapter, 2014-2018.
- **Convener**, National symposium: Probiotics and Functional Foods on Health Management” during 04 - 05 March 2019 in Tezpur University, Assam (India).
- **Associate Hostel Warden** of NMH Hostel at Tezpur University (2014-March, 2016).
- **Member in Tezpur University Biosafety Committee 2016-18.**
- **Joint Faculty Co-coordinator** of **TECHXETRA 2016** (Annual Technical Feast of Tezpur University) to be held on 4th to 6th Nov., 2016 in Tezpur University.
- **Committee member for Animal House facility** at Tezpur University 2016.
- **Faculty advisory committee for Central fresher’s Programme 2016** at Tezpur University.
- **Food Committee Member** of UNIFEST, held on 3rd to 7th Jan, 2016 in Tezpur University.
- **In-charge for Microbiology Lab under Food Testing Laboratory for NE States of India (MoFPI, GoI sponsored)**, Tezpur University, Oct 2015 till date.
- **Member of committee for selection of candidates for admission into PhD programme** of the department of FET, July, 2014-till date.
- **Member of board of studies for Department of Food Engineering and Technology**, Oct 2012 till date.
- **Departmental Training and placement In-charge**, June 2011 to 2017.
- **Departmental Research Council member**, July 2014 till date.
- **Departmental Academic Council member**, July 2014 till date.
- **Coordinator of Nutritional Committee of the university**, Nov. 2014 to Oct, 2015.
- **Advisory Committee for NCC activities** of Tezpur University 2015.
- **Member of Canteen Committee** of the Tezpur University from 2014 till date.
- **Faculty In-charge for Tezpur University Cricket**, March 2015 till 2017.
- **Organizing Member** of **TUEE 2014** and **TUEE 2013** (Tezpur University Entrance Exam) for admission in various programs based on all India test.
- Faculty sponsor coordinator of **TECHXETRA 2014** held on 16-17 October, 2014 in Tezpur University.
- **Faculty Co-coordinator** of **TECHXETRA 2012** (Annual Technical Feast of Tezpur University) held on 2nd to 4th Nov., 2012 in Tezpur University.
- **Anti-ragging Committee member** 2012 till date (Tezpur University)

- Departmental **Exam coordinator** for one year (2010-2011).
- Departmental **Course In-charge** for B.Tech, M.Tech and PhD (2010-2013).
- TUEE **Centre representative** 2011 (Gauhati); 2012 (Shillong); 2015 (Jorhat).
- **Invigilator** for **SET 2011** held on 12th June, 2011(Tezpur centre).
- **Invigilator** for UGC-NET Exam held on 24th December 2011.
- **In-charge member for Microbiology Lab under Food Testing Laboratory** for North Eastern States of India (MoFPI, GoI sponsored), Tezpur University.
- **Organizing committee member** of **DST Project Cluster meet** on "Food Processing Instrumentation" held on 13-14 October in Tezpur University.
- **Co-convener** of **National Seminar** on "Role of bioactive compounds in foods on human health" to be held from 14th to 16th November, 2011 in Tezpur University.
- **Organizing committee member** of **TechXetra2011** held on 21-23 October, 2011 in Tezpur University.
- **Organizing committee member** of **Annual General Meeting of Indian Science Academy (INSA)** held on 28-31, December, 2011.
- **Surveillance Committee Member** of UNIFEST, held on 16th to 20th December, 2011 in Tezpur University.

ACCOLADES RECEIVED

1. Selected to avail **Overseas Associateship for doing 1 year research at UK by DBT**, Minister of Science and Technology, Govt. of India for the year 2017-18.
2. **Certificate of appreciation of Academic achievement** during 25th Foundation Day (Silver Jubilee celebration) of Tezpur University on 21st January, 2018.
3. Awarded "**Anniversary Teacher Award 2015**" from School of Engineering in Assistant Professor category by Tezpur University on 26th Jan, 2016 for excellence in teaching, research and other administrative work of university.
4. Awarded "**First under Young Investigator Award**" to my student Mr. Pallab Kumar Borah for oral presentation titled "Modulation of in vitro digestibility of amylopectin corn starch triggered by structural alterations upon esterification with folic acid" authored by Pallab Kumar Borah, Michael Rappolt, **Raj Kumar Duary**, Anwesha Sarkar at National Symposium on "Probiotics and Functional Foods on Health Management" PFFHeM2019 dating 4th to 5th March, 2019 at the Tezpur University, Tezpur, Assam, India
5. Awarded "**First Best Poster Paper**" to my student Miss Preeti Sarkar for poster titled "To investigate the inhibitory effects of bioactive peptides (generated from silk industry waste) against endothelial dysfunctional factors involved in causing pro-inflammatory phenotype in human endothelial cells during vascular inflammation" by Preeti Sarkar, **Dr. Raj Kumar Duary**, Professor Giuseppe Valacchi at National Symposium on "Probiotics and Functional Foods on Health Management" PFFHeM2019 dating 4th to 5th March, 2019 at the Tezpur University, Tezpur, Assam, India.
6. Dr. RK Duary and team (Arin Kumar, Boristha Goswami, Raj Kumar Duary) were awarded "**1st Best Poster Award**" on topic entitled "Design and development of smartphone based Photometric sensor for detection of Urea adulteration in milk". At National Conference on Trends and Innovation in Food Processing: Prospects and Challenges, TIFPT 2017, 9th to 10th February, 2017 held at Department of Food Engineering and Technology, Tezpur University.

7. One of **my Ph.D Scholar: Mr. Pallab Kumar Borah (FPP15107)** has been selected for **Commonwealth Split Site Scholarship, at University of Leeds, UK** (CSC Reference No. INCN-2016-61) by Commonwealth Scholarship Commission in the UK for 1 year (from 1st of Oct., 2016 to 31st Sep., 2017).
8. One of **my Ph.D Scholar: Miss Preeti Sarkar** selected for **DST Indo-U.S. Fellowship for Women in STEMM at University of North Carolina, USA** under **Prof. Giuseppe Valacchi** for **4 months (Oct-Feb, 2019)**
9. Awarded **Young Scientists Research Grant** by Science & Engineering Research Board (SERB), DST (Department of Science & Technology, Government of India) for year 2014 on project: **"Encapsulation and controlled delivery of herbal extracts in dairy food matrix using cow milk protein against *in vitro* simulated inflammatory cell line models"**. [Registration No. SERB/LS-2/2014].
10. Awarded **Jawaharlal Nehru Award** for **P.G. Outstanding Doctoral Thesis Research in Agricultural and Allied Sciences 2011** by **Indian Council of Agricultural Research** held on **16th July 2012** at NASC Complex ICAR, Delhi.
11. Awarded **"First Best Poster Paper"** at 43rd Dairy Industry Conference, Indian Dairy Association, **Feb 19-21, 2015** held at Salt Lake, Kolkata, India on "Formulation of low-fat flavoured probiotic yoghurt consisting water chestnut starch as biothickener".
12. Awarded **"First Best Poster Paper"** at National conference cum workshop organized by the Food Engineering and Technology Dept, Tezpur University, India, on "Innovative prospects in food processing: integration of engineering and biological science" for paper entitled "*In silico* inhibition studies of various fruits and medicinal plant derived polyphenol against nuclear factor NF-kB pathway (p50 subunit) expressed during pro-inflammatory signaling pathway" held on **27th to 28th March, 2015**.
13. Awarded **"Second Best Paper"** entitle **"Potentiality of two promising putative indigenous strains of probiotic lactobacilli against inflammatory disorders"** in **Young Researchers group** at 1st Annual Conference along with An International Symposium on **Probiotics for Human Health- New Innovations and Emerging Trends**, organized by Probiotic Association of India (PAI) on 27-28, Aug, 2012, At Habitat World at India, Habitat Centre, New Delhi, India.
14. Awarded **Best Ph.D Thesis** during 2009-2010 in processing group from NDRI, Karnal, Haryana.
15. Awarded **"First Best Paper"** published in Indian Dairyman by IDA (39th Dairy Industry Conference held in Salt Lake, Kolkata in 4-6 Feb, 2011)
16. Awarded **"1st Best Poster Award"** on topic entitled "Comparative study between isoflavone content of Nutrela soya chunks and traditional fermented soybean based food called Tungrymbai" at National conference organized by the Food Engineering and Technology Dept, Tezpur University, 14-16 Nov **2011**.
17. **Fully Sponsered candidate** to attend International conference for oral presentation organized by **World Diabetes Congress in Dubai, UAE** from 04-08 December 2011 by **International Diabetes Federation**
18. Received **Institutional fellowship** for **Ph.D Programme** at NDRI, Karnal, 2006.
19. In organizing committee for Brain Storming Session on **"Vaccines and Diagnostics"**, NDRI, Karnal under auspices of National Academy of Agricultural Sciences (NAAS), New Delhi on 10th - 11th July, 2009.
20. Ranked **1st** in All India Entrance Exam 2004, for Master's programme in Dairy (ICAR, India).
21. Received JRF (**Junior Research Fellowship**)-ICAR during **M.Sc. programme**, India (2004-2006).

22. Qualified ICAR-NET (**National Eligibility Test**) Certificate in **2008 (Roll No 19290217)** and **2010 (Roll No 192204330826)**.

23. Recipient of **Merit Scholarship** during **B.Tech** programme.

PROFESSIONAL AFFILIATIONS

- Life time member of Probiotic Association of India.
- Annual member of Indian Dairy Association (IDA) (RE/EZ/OM/11456/AP).
- Life member of Association of Food Scientists and Technologists (AFST, India) (Membership No. AFST/LM/3-2019/TEZ/2994).

PERSONAL DETAILS

Date of Birth : June 1, 1982

Present Address : Assistant Professor, Dept of Food Engineering and Technology, Tezpur University,
Nappam, Sonitpur, Assam, India-784028.

Permanent address : S/o Joy Dev Duary, Vill. + PO: Debipur, PS: Nandigram, East Midnapur, West
Bengal, India-721650.