

Tista Roy Chaudhuri

Contact: r.tista@gmail.com; tr22@buffalo.edu; Tista.Chaudhuri@ext.uk-essen.de

Phone: +1 (530) 378-4782, +49 162 605-4885

Social media: https://www.researchgate.net/profile/Tista_Roy_Chaudhuri

www.linkedin.com/in/tista-roy-chaudhuri

EDUCATION

Roswell Park Comprehensive Cancer Center, State University of New York at Buffalo- Ph.D in Molecular and Cellular Biophysics and Biochemistry December 2011

Centre for Biotechnology, College of Engineering, Anna University, India- B.Tech (equivalent to B. Engineering) in Industrial Biotechnology June 2005

EMPLOYMENT and RESEARCH EXPERIENCE

- University Medicine Essen (UME) Medical Scientist Academy (UMESciA) program at the University of Duisburg in Essen Germany. <https://www.uni-due.de/med/umescia/> December 2022-present

Project: *Gold nanorod mediated photothermal therapy for targeting immune cells in the tumor microenvironment.*

Overall objective: Therapeutic targeting of immune-suppressive granulocytic mesenchyme derived suppressor cells (PMN-MDSC) in the tumor stroma.

Aim 1: Gold nanorod mediated photothermal therapy- Nanorod size-dependent effect on immunogenic cell death of PMNs, tumor biology, and tumor microenvironment.

Aim 2: Tumor-immune cell crosstalk upon therapeutic ablation of immunosuppressive PMN-MDSC. Principal Investigators: Profs. Sebastian Schluecker and Sven Brandau.

- Research Scientist (volunteer position), Dept of Pharmaceutical Sciences, School of Pharmacy, State University of New York at Buffalo February 2021- present

- Research Scientist, Dept of Pharmaceutical Sciences, School of Pharmacy, State University of New York at Buffalo December 2019-February 2021

- Postdoctoral fellow, Dept of Pharmaceutical Sciences, School of Pharmacy, State University of New York at Buffalo July 2014-November 2019

Principal Investigator: Dr. Robert M. Straubinger, Distinguished Professor

Stromal targeting for altering the TME in pancreatic ductal adenocarcinoma (PDAC) therapeutics-

- *Mechanism of epithelial-to-mesenchymal transition (EMT) induced by stromal targeting of cancer associated fibroblasts using sonic hedgehog inhibitors.*
- *Physiological multiparametric magnetic resonance imaging (MP-MRI) to predict and quantify tumor physiological properties that affect drug delivery- tumor-diffusion, water mobility, protein-bound water, etc.*
- *Development of lipidic iron nanoparticles as MR contrast agents- testing lipid coating for enhanced circulation times.*
- *Mechanisms of tumor priming for enhancing vascular perfusion and permeability.*

Doctoral studies

Principal Investigator: Prof. Robert M. Straubinger

2005- 2011

“Strategies for improving nanoparticulate delivery to solid tumors mediated by vascular permeability modulation”

I investigated the *mechanism of tumor vascular permeability* by nanoparticulate drugs in brain and pancreatic cancers. Studies were conducted under the following two broad scopes:

- (i) *Pharmacological and tissue-level impact of perivascular localization and altered pharmacokinetics of cytotoxic lipidic nanoparticles* in orthotopic 9L *Glioblastoma* in rats.
- (ii) *Immunohistological and morphological effects of SHH on tumor vasculature in pancreatic cancer*.

Predoctoral research experience

2001- 2005

- C¹³-labeling of methyl side chains in dsRNA Binding Domain of Human Protein Kinase R for studying Relaxation Dynamics.
Principle Investigator- Dr. Nanduri S. Rao
Institute: Tata Institute of Fundamental Research, Mumbai, India.
- Purification and Crystallization of Mycobacterial threonyl tRNA synthase for evolutionary studies in a primitive system using X-Ray Crystallography.
Principle Investigator- Dr. Rajan Sankaranarayanan
Institute: Center for Cellular and Molecular Biology, Hyderabad, India.
- Binding assays of 1,3-ANS to Tubulin using scatchard analysis and the chaperone- like activity of Tubulin.
Principle Investigator- Dr. Bablu Bhattacharya
Institute: Biochemistry Department, Bose Institute, Kolkata, India.

PUBLICATIONS

- Size matters: The effect of gold nanorod size on photothermal therapy-mediated therapeutic targeting of neutrophils. Tista Roy Chaudhuri, Marija Kovacevic Sarmiento, Helene Giesler, Michael Erlanz, Kim Lamers, Ronja Schirrmann, Milen Nachev, Rebeka Bosnjakovic, Sebastian Schlücker, Sven Brandau. Manuscript in preparation.
- Dual-hit strategy with smoothed and FGFR1 inhibitors for therapeutic targeting of pancreatic cancer in patient-derived xenograft tumors. Tista Roy Chaudhuri, Ewa K. Stachowiak, Qingxiang Lin, Spencer R. Rosario, Joseph A. Spornyak, Wen Wee Ma, Michal K. Stachowiak, Michelle K. Greene, Gerard P. Quinn, Simon S. McDade, Martin Clynes, Christopher J. Scott and Robert M. Straubinger. *Clin Cancer Res* (2024) 30 (7): 1367–138. This work appeared as the cover article of Clinical Cancer Research.
- Fibroblast growth factor receptor 1 inhibition suppresses pancreatic cancer chemoresistance and chemotherapy-driven aggressiveness. Qingxiang Lin, Andrea Serratore, Jin Niu, Shichen Shen, Tista Roy Chaudhuri, Wen Wee Ma, Jun Qu, Eugene S. Kandel, Robert M. Straubinger. *Drug Resistance Updates*, Volume 73, 2024, 101064.
- Expression of fibroblast growth factor receptor 1 correlates inversely with the efficacy of single-agent fibroblast growth factor receptor-specific inhibitors in pancreatic cancer. Lin, Q., Serratore, A., Perri, J., Roy Chaudhuri, T., Qu, J., Ma, W. W., Kandel, E. S., & Straubinger, R. M. *British Journal of Pharmacology*, 1–21.
- Formation of hydrated PEG layers on magnetic iron oxide nanoflowers shows internal magnetisation dynamics and generates high in-vivo efficacy for MRI and magnetic hyperthermia. Eoin P. McKiernan, Cara Moloney, Tista Roy Chaudhuri, Shane Clerkin, Kevin Behan, Robert M. Straubinger, John Crean, Dermot F. Brougham. *Acta Biomaterialia*, 2022.
- Long-circulating magnetoliposomes as surrogates for assessing pancreatic tumour permeability and liposome deposition. Cara Moloney, Tista Roy Chaudhuri, Joseph A. Spornyak, Robert M. Straubinger, Dermot F. Brougham. *Acta Biomaterialia*, Volume 158,2023; 611-624, ISSN 1742-7061.
- Roy Chaudhuri T, Straubinger RM. Nanoparticles for brain tumor delivery. In: Lonser RR, Sarntinoranont M, and Bankiewicz K, (eds). *Nervous System Drug Delivery: Principles and Practice*. San Diego: Elsevier Inc./Academic Press, 2019: 229-250.

- Tumor-priming *Smoothened* inhibitor enhances deposition and efficacy of cytotoxic nanoparticles in a pancreatic cancer model. Roy Chaudhuri T, Straubinger NL, Pitoniak RF, Hylander BL, Repasky EA, Ma WW, Straubinger RM. Molecular Cancer Therapy; 2016 Jan;15(1):84-93.
- Mechanisms of tumor vascular priming by a nanoparticulate doxorubicin formulation. Roy Chaudhuri T, Arnold RD, Yang J, Turowski SG, Qu Y, Sperry JA, Mazurchuk R, Mager DE, Straubinger RM. Pharm Res. 2012 Dec;29(12):3312-24.
- Methyl dynamics for understanding hydrophobic core packing of dynamically different motifs of double-stranded RNA binding domain of protein kinase R. Barnwal RP, Chaudhuri TR, Nanduri S, Qin J, Chary KV. Proteins. 2006 Feb 1; 62(2):501-8.

MEMBERSHIPS, AWARDS AND OTHER

- Early career fellow, CENIDE - Center for Nano integration Duisburg-Essen.
 - Peer-reviews: Regular peer-reviewer at PLOS ONE and AAPS journals.
 - AACR member
 - Visiting Summer Research Fellowship awarded by Tata Institute of Fundamental Research, Mumbai, India.
 - Summer Fellowship awarded by Indian Academy of Science, Bangalore, India.
-

RESEARCH SUPPORT AND/OR SCHOLASTIC PERFORMANCE

Immune priming strategy to improve delivery and efficacy of immunotherapeutics in pancreatic cancer. The purpose of the project is modulation of pancreatic cancer stroma to enhance tumor penetration of checkpoint inhibitor mAbs, as well as immune cell infiltration. Our approach is to evaluate combination therapies with tumor stromal modulators to inhibit desmoplasia and invoke a pro-inflammatory immune response, and thereby enhance tumor infiltration of T cells to PDAC tumors.

1/1/21 to 12/31/21

From: UB Clinical and Translational Sciences (CTSI, NIH)

To: Tista Roy Chaudhuri; Straubinger (PI)

Strategies for mapping inter-individual differences in tumor physiology by multiparametric magnetic resonance imaging (MP-MRI) to predict and quantify tumor physiological barriers of drug delivery.

Physiological multiparametric magnetic resonance imaging (MP-MRI) to predict and quantify tumor physiological barriers of drug delivery- My work with patient-derived xenografts of pancreatic cancer showed extreme drug delivery barriers that resulted in very low deposition of both MR contrast agents and therapeutics. Even so, individual patient tumors differ in terms of vascularity and stromal content, and thereby differ in the deposition and efficacy of macromolecular therapeutics (mAbs and nanoparticles). Traditional perfusion MR imaging does not sufficiently reflect drug deposition and efficacy. However, I found that subtle but therapeutically relevant changes in tumor permeability by sHHi treatment is reflected by increases in tumor diffusivity measured using diffusion weighted-MRI. Given that tumor diffusivity reflects only one of the multiple physiological barriers of drug delivery, I am developing a physiological MR imaging platform integrating histogram and textural features from multiple MR imaging modalities into a neural network-based mathematical framework. The *objective* is to predict permeable microenvironments in tumors prone to macromolecular deposition and accumulation, prior to treatment. The *approach* is to employ machine learning algorithms and other mathematical framework such as wavelet transformation to derive a combination of MR parameters that correlate with tissue-level deposition of therapeutic checkpoint mAbs and nanoparticles.

9/1/19- 8/31/20, 12/21- 12/22

From: UB Center for Protein Therapeutics Consortium CPT Projects 9, 9a

To: Straubinger (PI)

Tumor priming sequences combined with novel nanoparticle drug carriers for enhanced therapeutic efficacy in pancreatic cancer: a tripartite USA/Northern Ireland/Republic of Ireland consortium.

This project seeks to establish a mechanistic basis for the development of 'tumor priming' chemotherapy agents, in which one agent compromises tumor vascular barriers to enhance uptake of a second chemotherapeutic entity encapsulated in nanoparticles.

Role: postdoctoral scientist

From: NIH/NCI R01CA198096

To: Straubinger (contact PI/PD)

09/01/2015 - 08/31/2020 (NCE)

Chemophototherapy with Porphyrin-phospholipid Liposomes Permeabilized by Red Light.

The goal of this project is to develop light-triggered porphyrin-bearing liposomes containing doxorubicin for controlled drug release within pancreatic cancers.

Role: postdoctoral scientist

From: NIH/NCI 1R01EB017270

To: Lovell (PI)

07/01/2018-06/30/2022

PRESENTATIONS

- Mechanism and effect of gold nanorod uptake in immune cells for photothermal therapy. Center for nano-integration Duisburg Essen (CENIDE) conference, May 2023.
- Tumor-priming strategy for enhancing macromolecule delivery in pancreatic ductal adenocarcinoma (PDAC). Postdoc symposium, UMESCIA, Uniklinikum Essen, Germany. 2022.
- Biological and biophysical tumor microenvironment responses to sonic hedgehog pathway inhibition in pancreatic cancer. Special seminar, Dept. of Pharmaceutical Sciences, UB, 2019.
- Multiparametric MRI-based physiological imaging to predict macromolecule penetration and efficacy in pancreatic cancer. Center for Protein Therapeutics meeting, August 2019.
- Non-invasive detection of tumor-priming by *Sonic Hedgehog* pathway inhibition in Pancreatic Cancer stroma. Cancer Research UK, Cambridge University, March 2017.
- Mechanistic evaluation of Stromal Permeability modulation by Sonic Hedgehog pathway inhibition in Pancreatic Ductal Adenocarcinoma. Cancer Research UK, Cambridge University. December 2016.
- Vascular and Stromal Permeation by Sonic Hedgehog pathway inhibition in Pancreatic Ductal Adenocarcinoma. Southwestern medical center, University of Texas, Dallas. October 2016.
- Sonic Hedgehog Inhibitor LDE225 increases deposition and efficacy of cytotoxic nanoparticles in Pancreatic Cancer. Special seminar, Istituto Italiano di Tecnologia, Napoli, Italy. March 2013.
- Modulation of Tumor Vascular Permeability to Improve Delivery and Efficacy of Nanoparticulate Drug Carrier: Roswell Park Cancer Institute, 2012.
- Sonic Hedgehog Inhibitor LDE225 as a Potential Modulator of Tumor Vasculature in Pancreatic Cancer: Roswell Park Cancer Institute, 2011.
- Combination of chemotherapy with vascular disrupting agents to improve therapeutic efficacy in rat *glioblastoma*: Roswell Park Cancer Institute, 2008.

POSTERS

- Tista Roy Chaudhuri, Ronja Schirrmann, Sayantan De, Rebeka Bosnjakovic, Helene Giesler, Michelle Hechler, Barbara Sacca, Sebastian Schlücker, Sven Brandau. Gold nanorods for selective immune cell targeting. *Essen Translational Oncology Symposium, Deutschen Konsortium für Translationale Krebsforschung (DKTK)*, February 2023.

- Roy Chaudhuri T; Quinn G; Greene M; McDade S; Scott C; Straubinger RM. FGFR deregulation is induced by *Smoothened* inhibitor- an integrated pathway analysis of RNASeq data. *Buffalo Pharmaceuticals Symposium*, University at Buffalo, July 2018.
- Roy Chaudhuri T; Lin Q; Ma WW; Straubinger RM. FGFR1 inhibitor reverses *Smoothened* inhibitor-induced Epithelial-to-Mesenchymal transition and proliferation in Pancreatic Ductal Adenocarcinoma. *Proc. Amer. Assoc. Cancer Res. (AACR) Annual Meeting*, Washington D.C, April 2017.
- Roy Chaudhuri T; Lin Q; Ma WW; Straubinger RM. FGFR1 inhibitor reverses *Smoothened* inhibitor-induced Epithelial-to-Mesenchymal transition and proliferation in Pancreatic Ductal Adenocarcinoma. *Pharmacology day, Roswell Park Comprehensive Cancer Center*, Buffalo, May 2017.
- Lin Q; Roy Chaudhuri T; Ma WW; Straubinger RM. FGFR inhibitors enhance gemcitabine sensitivity in pancreatic ductal adenocarcinoma. *Proc. Amer. Assoc. Cancer Res. (AACR) Annual Meeting*, Washington D.C, April 2017.
- Roy Chaudhuri T; Turowski S; Straubinger NL; Sperryak JS; Straubinger RM. Apparent diffusion coefficient measurements predict tumor stromal effects of *Smoothened* inhibitors of sonic hedgehog signaling. *Engineering and Physical Sciences in Oncology (AACR) conference*, Boston, USA. June 2016.
- Drummond DC, Straubinger NL, Roy Chaudhuri T, Moser M, Kamoun WS, Luus L, Huang ZR, Tipparaju S, Gillard B, Morrison C, Repasky E, Kirpotin DB, Straubinger RM. Activity of an EphA2-targeted docetaxel nanoliposome in pancreatic patient-derived models as monotherapy and in combination with gemcitabine. *Proc. Amer. Assoc. Cancer Res. (AACR) Annual Meeting*, Washington DC, April 2017.
- Roy Chaudhuri T; Straubinger NL; Pitoniak R; Hylander B; Ma WW; Jusko WJ; Repasky EA; Straubinger RM. Effects of sonic hedgehog inhibitor combined with nanoparticulate drug delivery on vascular permeability and efficacy in a pancreatic cancer model. *Proc. Amer. Assoc. Cancer Res. (AACR) Annual Meeting*, Chicago, IL, (2012a)
- Roy Chaudhuri T; Arnold RD; Yang J; Turowski SG; Qu Y; Sperryak JS; Mazurchuk R; Mager DE; Straubinger RM. Modulation of tumor vasculature by a single dose of long-circulating sterically-stabilized liposomal doxorubicin. *Pharmacology Day*, University at Buffalo, 2010.
- Yang J; Sperryak J; Qu Y; Roy Chaudhuri T; Turowski S; Mazurchuk R; Mager D; Straubinger R. Population pharmacokinetic and pharmacodynamic analysis of DCE-MRI data in a rat brain tumor model. *Amer. Assoc Pharm. Sci. (AAPS) Annual Meeting*, San Diego, CA, 3285-a (2007a).
- Yang J; Sperryak J; Qu Y; Roy Chaudhuri T; Turowski S; Mazurchuk R; Mager D; Straubinger R. Population pharmacokinetic and pharmacodynamic analysis of DCE-MRI data in a rat brain tumor model. *Pfizer-Univ. Buffalo/SUNY Alliance Annual Scientific Meeting*, Pfizer, Inc, Groton, CT, (2007a).

SKILLS

- Grant writing
- Tumor biology- *In vitro* (3D) and *in vivo* tumor models, signaling pathways, molecular pharmacology.
- Nanoparticle synthesis and characterization (lipidic NPs and Gold nanorods).
- Immunology- Immune cell isolation, migration, FACS & ELISA.
- Molecular biology- Vast experience in immunohistological techniques; experience in staining with different extra- and intra- cellular proteins, western blots, FACS.
- Preclinical MR Imaging: Theoretical and practical working knowledge- experimental optimization, image acquisition, processing and analysis of images. Also well versed in the theory and practice of other imaging modalities such as preclinical *in vivo* fluorescence imaging system (IVIS).

- Microscopy: Extensive experience in fluorescence, light, and two-photon confocal microscopy.
- Quantitative image analysis- Histogram and texture analyses, principal component analyses in ImageJ and MATLAB.
- Pharmacokinetics and Pharmacodynamics.
- Experience in some common bioinformatic approaches to analyze transcriptomics and proteomics data- GSEA, upstream/downstream analyses, visualization of gene regulatory networks.

Specific Laboratory Skills

- Synthesis- Sterically-stabilized liposome and gold nanorods: lipid film method, remote loading of liposomes, fluorescent labeling, and characterization (size, zeta potential, and phosphate assay).
- Non-invasive imaging: preclinical magnetic resonance imaging (Hi-res, Diffusion-weighted, DCE-MRI), Live-animal fluorescent imaging (IVIS Spectrum), intravital microscopy.
- Microscopy: Fluorescence, confocal, super-resolution (STED) and optical microscopy.
- Surgical and animal handling techniques in mice and rats: intracranial and subcutaneous tumor implantation using stereotactic devise, jugular and femoral vein cannulations, injections (IV, subcutaneous, intraperitoneal, IM), oral gavages, terminal blood perfusion (cardiac puncture), tissue, tumor, and brain excision, and fixation.
- Ex vivo techniques: tissue embedding, cryosectioning, immunohistochemistry, immunofluorescence, ISH.
- Cell and tissue culture: Tumor sphere-immune cell co-cultures model, PDAC organoids.
- Protein & small molecule drug analyses in blood and tumor (for pharmacokinetic studies).
- Molecular Biology: rtPCR, immunofluorescence, flow cytometry.
- Systems pharmacology: Ingenuity Pathway Analysis of RNASeq data
- Statistics: Matlab, ImageJ, GraphPad, R.

EXTRACURRICULAR INTERESTS

Science-art

Wildlife photography and articles

- Article (Bangla print journal)- 'On the road to Chandril'. Roy Chaudhuri S, Roy Chaudhuri T. Prakriti Bhalopahar; February 2017, 6(4).
- Article (Bangla print journal)- 'Andaman and Nicobar Islands'. Roy Chaudhuri S, Roy Chaudhuri T. Prakriti Bhalopahar

Volunteering*:

- Human-wildlife conflict Oct-Dec 2013*
 Organization: Center for Wildlife Studies, Bangalore, India
 Tiger Conservation Project Dec 2012- Feb 2013*
 Organization: WWF-India
- Internship- Luisenpark zoo, Mannheim, Germany. Dec 2017

Scuba Diving

- Certifications- Beginners and Advanced Open Water Certifications, and volunteer dive-helper Organization: PADI-Professional Association of Diving Instructors
 Instructor: Pablo Garcia (171239), Otro Mundo Dive Center, Montanita, Ecuador June 2012*

*While on an academic break for family-related reasons