

Mohit Kumar Jolly

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EDUCATION

Rice University, Houston, TX, USA

Ph.D., Bioengineering 2012 – 2016 (expected)

Advisors: Dr. Herbert Levine, (Late) Dr. Eshel Ben-Jacob

Graduate Certificate in Teaching and Learning 2016 (expected)

Indian Institute of Technology (IIT) Kanpur, Kanpur, India

Master of Technology (**M.Tech.**), Biological Sciences & Bioengineering 2010-2012

Bachelor of Technology (**B.Tech.**), Biological Sciences & Bioengineering 2006-2010

M.Tech. advisor: Dr. Pradip Sinha, B. Tech. advisor: (Late) Dr. Anupam Pal

RESEARCH EXPERIENCE

Rice University, Houston, TX

Graduate Student, Department of Bioengineering 2012 – present

IIT Kanpur, Kanpur, India

Masters' Student, Department of Biological Sciences & Bioengineering 2010 – 2012

Johns Hopkins University, Baltimore, MD

Visiting Student, Department of Biomedical Engineering May – July 2009

IIT Kanpur, Kanpur, India

Summer Undergraduate Research Grant for Excellence (SURGE) Fellow May – July 2008

PUBLICATIONS

(* denotes equal contribution)

(Google scholar citations: 196, h-index: 7, i10-index: 5)

1. **Jolly MK**, Tripathi SC*, Jia D*, Mooney SM, Celiktas M, Mani SA, Hanash S, Pienta KJ, Ben-Jacob E, Levine H (2016). Stability of the hybrid epithelial /mesenchymal phenotype. **Oncotarget**, in press
2. Tripathi SC, Peters HL, Taguchi A, Katayama H, Wang H, Momin A, **Jolly MK**, Celiktas M, Rodriguez-Canales J, Liu H, Behrens C, Wistuba II, Ben-Jacob E, Levine H, Molldrem JJ, Hanash SM, Ostrin EJ (2016). Immunoproteasome deficiency is a feature of non-small cell lung cancer with a mesenchymal phenotype and is associated with a poor outcome. **Proc. Natl. Acad. Sci. USA**, in press
3. Huang B, **Jolly MK**, Lu M, Tsarfaty I, Ben-Jacob E, Onuchic JN (2015). Modeling the transitions between collective and solitary migration phenotypes in cancer metastasis. **Sci Rep**, 5: 17379
4. **Jolly MK**, Boareto M, Huang B, Jia D, Lu M, Onuchic JN, Ben-Jacob E, Levine H (2015). Implications of the hybrid epithelial/mesenchymal phenotype in metastasis. **Front. Oncol.**,5: 155
5. Boareto M, **Jolly MK**, Ben-Jacob E, Onuchic JN (2015). Jagged mediates differences in normal and tumor angiogenesis by affecting tip-stalk fate decision. **Proc. Natl. Acad. Sci. USA**, 112 (29): E3836-44
6. **Jolly MK***, Jia D*, Boareto M, Mani SA, Pienta KJ, Ben-Jacob E, Levine H (2015). Coupling the modules of EMT and stemness: A tunable 'stemness window' model. **Oncotarget**, 6(28): 25161-74
7. **Jolly MK***, Boareto M*, Lu M, Clementi C, Onuchic JN, Ben-Jacob E (2015). Operating principles of Notch-Delta-Jagged module of cell-cell communication. **New J. Phys.**, 17: 055021
8. Jia D*, **Jolly MK***, Boareto M, Parsana P, Mooney SM, Pienta KJ, Levine H, Ben-Jacob E (2015). OVOL guides the epithelial-hybrid-mesenchymal transition. **Oncotarget**, 6 (17): 15436-48

9. Boareto M, **Jolly MK**, Lu M, Onuchic JN, Clementi C, Ben-Jacob E (2015). Jagged-Delta Asymmetry in Notch Signaling can give rise to a Sender/Receiver hybrid phenotype, **Proc. Natl. Acad. Sci. USA**, 112 (5): E402-E409
10. **Jolly MK**, Huang B, Lu M, Mani SA, Levine H, Ben-Jacob E (2014). Towards elucidating the connection between epithelial-mesenchymal transitions and stemness, **J. R. Soc. Interface**, 11 (101) : 20140962
11. Huang B, Lu M, **Jolly MK**, Tsarfaty I, Onuchic JN, Ben-Jacob E (2014). The three-way switch operation of Rac1/RhoA GTPase-based circuit controlling amoeboid-hybrid-mesenchymal transition, **Sci. Rep.** 4: 6449
12. Lu M*, **Jolly MK***, Onuchic JN, Ben-Jacob E (2014). Toward Decoding the Principles of Cancer Metastasis Circuits. **Cancer Res.**, 74 (17): 4574-4587
13. **Jolly MK***, Rizvi MS*, Kumar A, Sinha P (2014). Mathematical modeling of sub-cellular asymmetry of Fat-Dachsous Heterodimer for generation of Planar Cell Polarity, **PLoS ONE** 9(5): e97641
14. Lu M*, **Jolly MK***, Levine H, Onuchic JN, Ben-Jacob E (2013). MicroRNA-based regulation of epithelial-hybrid-mesenchymal cell fate determination. **Proc. Natl. Acad. Sci. USA**, 110 (45): 18144-18149
15. Lu M, **Jolly MK**, Gomoto R, Huang B, Onuchic JN, Ben-Jacob E (2013). Tristability in Cancer Associated miRNA-TF Chimera Toggle Switch. **J. Phys. Chem. B**, 117 (42): 13164-13174

In revision/under review:

1. Boareto M, **Jolly MK**, Goldman A, Pietila M, Mani SA, Sengupta S, Ben-Jacob E, Levine H, Onuchic JN. Notch-Jagged signaling can give rise to clusters of cells exhibiting a hybrid epithelial/mesenchymal phenotype
2. Somarelli JA, **Jolly MK**, Wang S, Bartholf-Dewitt S, Hish A, Gilja S, Eward W, Ware K, Levine H, Armstrong AJ, Garcia-Blanco MA. Mesenchymal-epithelial transition in sarcomas is controlled by the combinatorial expression of GRHL2 and miR-200s.
3. Mooney SM, **Jolly MK**, Levine H, Kulkarni P. Phenotypic plasticity in prostate cancer: the role of intrinsically disordered proteins
4. Grigore AD*, **Jolly MK***, Jia D, Farach-Carson MC, Levine H. Tumor budding: the name is EMT. Partial EMT.
5. **Jolly MK**, Jia D, Levine H. The art of modeling cell-fate decisions in biological systems (Book chapter)
6. Jia D, **Jolly MK**, Levine H. Use of bifurcation analysis in biological systems (Book chapter)

CONFERENCES, SEMINARS, WORKSHOPS

Invited Talks:

1. Network motifs that stabilize the hybrid epithelial /mesenchymal phenotype. *American Physical Society March Meeting*, Baltimore, March 2016
2. Clusters of circulating tumor cells: primary ‘bad agents’ of metastasis. *9th Annual q-bio Summer School*, Fort Collins, July 2015
3. Modeling the phenotypic plasticity of metastatic cancer stem cells. *Annual Meeting of Society of Mathematical Biology*, Atlanta, July 2015
4. Looking at epithelial plasticity from a physicist’s perspective. *University of Texas Health Science Center*, Houston, October 2014

Contributed Talks:

1. United we stand, divided we fall: Advantages of collective cell migration to cancer. *8th Annual q-bio Meeting*, Santa Fe, August 2014
2. Cancer Cell Migration: Yes, No, Maybe? *8th Annual q-bio Summer School*, Albuquerque, July 2014

Workshops/Summer Schools Attended:

1. 8th Annual q-bio Summer School (Theme: Stochastic Gene Regulation), Albuquerque, July 2014
2. SERC School on Introduction to Systems and Synthetic Biology, IIT Bombay, April-May 2012

Poster Presentations:

1. Coupling the Decision-making of EMT and Stemness: A Flexible ‘Stemness Window’ Model, *CPRIT Conference on Innovations in Cancer Prevention and Research*, Austin, November 2015
2. Stemness and stability in the hybrid epithelial/mesenchymal phenotype. *2nd Annual Hallmarks of Cancer Symposium*, Rice University, October 2015
3. Stemness in the hybrid epithelial/mesenchymal phenotype. *Gordon Research Conference (GRC) on Stem Cells and Cancer*, Ventura, February 2015
4. Coupled decision-making of EMT and stemness: a bottom-up regulatory model. *American Association for Cancer Research (AACR) meeting on Computational & Systems Biology*, San Francisco, February 2015
5. Stemness in epithelial, hybrid epithelial/mesenchymal and mesenchymal phenotypes. *11th Annual Computational and Theoretical Biology Symposium*, Rice University, December 2014
6. Modeling the association between epithelial-mesenchymal transition (EMT) and stemness. *8th Annual q-bio Meeting*, Santa Fe, August 2014
7. Characterizing the hybrid epithelial/mesenchymal phenotype: collective migration of carcinoma cells. *1st Annual Bioengineering Graduate Student Symposium*, Rice University, May 2014
8. Hybrid Epithelial/Mesenchymal Phenotype and Epithelial Plasticity: Role of (miR-200/ZEB), *105th Annual Meeting of American Association for Cancer Research (AACR)*, San Diego, April 2014
9. Tristable ‘three-way’ miR-TF toggle switch: The hybrid epithelial/mesenchymal phenotype. Meeting on *Translating Cancer Data and Models to Clinical Practice*, Institute for Pure & Applied Mathematics, UCLA, Los Angeles, February 2014
10. Tristability in miR-TF toggle switch: The hybrid epithelial/mesenchymal phenotype , *10th Annual Computational and Theoretical Biology Symposium (CTBS)*, Rice University, Houston, December 2013
11. Modeling the global regulation of Planar Cell Polarity in wing epithelium, *12th International Conference on Systems Biology (ICSB)*, Heidelberg/Mannheim, August 2011
12. Keeping the hair aligned: Mathematical modeling of global module of Planar Cell Polarity, *International Conference on Mathematical Biology*, Indian Institute of Science, Bangalore, July 2011
13. Mathematical modeling of global regulation of PCP in Drosophila”, *International Conference on Mathematical and Theoretical Biology*, Pune, January 2012

AWARDS AND HONORS

Winner , IBiology Young Scientist Series (YSS)	2016
YSS is a competition among biology graduate students to communicate their work to peers and science enthusiasts	
IBB Travel Award , Institute of Biosciences and Bioengineering (IBB), Rice University	2016, 2015
Travel Award , Rice University Graduate Student Association	2015
Q-bio conference fellowship , Los Alamos National Laboratory	2014
2nd Best Poster Award , 1 st Annual Bioengineering Graduate Student Symposium, Rice University	2014
Best Poster Award , 10 th Annual Computational and Theoretical Biology Symposium, Rice University	2013
Overall 2nd place and People’s Choice Award , SCREECH, Rice University	2013
SCREECH is a graduate student competition to communicate one’s research in 90 seconds to people from all fields.	
Summer Innovation Award , Biological Sciences & Bioengineering, IIT Kanpur	2009
SURGE (Summer Undergraduate Research Grant for Excellence) fellow , IIT Kanpur	2008
SURGE is a reputed undergraduate research program attended by students of Caltech, ECP France and IIT Kanpur	
Top 0.6% of 300,000 students appeared in the IIT Joint Entrance Examination (JEE), India	2006

TEACHING AND ADVISING EXPERIENCE

-
- Peer Consultant**, Center for Written, Oral and Visual Communication (CWOVC), Rice University 2014 – present
- Mentored more than 100 students across disciplines in effective academic communication (abstracts, manuscripts, seminars, essays, personal statements, dissertation chapters) via one-to-one consultation sessions
 - Designed and conducted a four-week workshop on ‘Communicating Science to non-experts’ for graduate students and postdoctoral fellows across different disciplines

- Mentor**, Frontiers in Science (FIS) - Summer Undergraduate Research Program 2015
- Guided the research project for an undergraduate student from the University of Houston
- Fellowship Coach**, Office of Graduate and Postdoctoral Studies (GPS), Rice University 2015 – present
- Mentored graduate students for fellowships such as NSF Graduate Research Fellowship Programme (GRFP)
- Teaching Assistant**, BIOE 372 (Biomechanics), Rice University 2014
- Conducted guest lectures, designed and taught recitation sections, held office hours, managed three UG graders
- Teaching Assistant**, BIOE 322 (Fundamentals of Systems Physiology), Rice University 2013
- Designed and taught recitation sessions, held office hours
- Teaching Assistant**, BIOE 444 (Mechanical Lab Testing Module), Rice University 2013
- Oversaw 10 UG students run mechanical testing experiments, held office hours, graded lab reports and final project

PROFESSIONAL MEMBERSHIP AND SERVICE

- Associate Member**, American Association for Cancer Research (AACR) May 2013-present
- Student Member**, Society for Mathematical Biology (SMB) March 2015-present
- Student Member**, American Physical Society August 2015-present

Reviewed manuscripts for Bioinformatics, Journal of Laboratory Automation

OUTREACH

- Writer**, Research Media Services, Gubbi Labs, Bangalore 2015 – present
- Written press releases and news stories for research conducted at IISc Bangalore and NCBS Bangalore
- Contributor**, ‘The Conversation’ 2014 – present
- Wrote ‘science news’ format articles for the public, based on recent research articles (~**300,000 views** by now) (**URL**: <https://theconversation.com/profiles/mohit-kumar-jolly-110631/articles>)
- Blog Team Member**, Lindau Nobel Laureate Meeting 2014
- Interviewed the Nobel Laureates Profs. Walter Gilbert, Martin Evans, and Oliver Smithies
- Co-founder and Editor-in-Chief**, NERD (quarterly campus science magazine at IIT Kanpur) 2008-2010
- Led a team of students in fruitful science journalism, and managed the content, design and layout of 8 issues
 - Interviewed eminent scientists such as Dr. Martin Chalfie (Nobel Laureate, 2008, Chemistry) and Dr. R Chidambaram (Principal Scientific Advisor, Government of India) (**URL**: <http://www.iitk.ac.in/nerd/>)