

M. Madan Babu, PhD, FRSC, FMedSci

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1. Current Position at St Jude

Member, Department of Structural Biology	July 2020 - Present
Endowed Chair in Biological Data Science	July 2020 - Present
Director, Center for Data Driven Discovery St. Jude Children's Research Hospital Memphis, TN 38105	July 2020 - Present

2. Education and Training (list all degrees awarded, and training programs completed)

B.Tech. in Biotechnology (Gold Medal), Anna University, Chennai, India	1997-2001
Ph.D., MRC Lab of Molecular Biology and University of Cambridge, United Kingdom	2001-2004
Postdoctoral Fellowship, NCBI, National Institutes of Health, Bethesda, MD	2005-2006

3. Key Accomplishments Summary

My research group aims to gain a detailed understanding of how regulation is achieved distinct levels of organization in cellular systems. We place a particular emphasis on understanding how the precise structure and intrinsically disordered regions of proteins contribute to cellular regulation. Specifically, we investigate regulation at three levels of organization: molecules, processes and genomes. At the molecular level, we aim to discover novel features of regulatory and signalling proteins such as transcription factor and membrane protein receptor families. At the process level, we aim to understand how the different regulatory mechanisms and networks contribute to cellular homeostasis, and how their breakdown gives rise to disease outcomes. At the genome level, we study the interplay between regulation and genome evolution with the aim of understanding the constraints placed on genes, proteins and genomes. The ultimate goal of our research programme is to decipher the molecular basis of human diseases caused by regulatory dysfunction. To this end, we develop new genome-scale experimental approaches and data science approaches to mine and integrate disparate datasets from diverse model organisms. We envision that the findings from our research will help to better understand how mutations that affect various regulatory processes result in dysfunctions associated with diseases, and that the discovery of design principles of regulation can be exploited in biotechnology and medicine.

Contributions to understanding signalling mechanisms by G-protein-coupled receptors (GPCRs). Structural proteins with the GPCR fold are major drug targets (27% of all drug sales; US\$ 222 billion per annum). GPCR-mediated signaling pathways govern almost every aspect of human physiology, from the immune and the nervous system, reproduction and hormones, to vision and taste. We have developed innovative data analysis approaches such as network representations of protein structures to study this large gene family. We defined structural similarities and differences in mechanisms of action and our findings are enabling interpretation of the effects of human polymorphisms, disease-causing mutations, investigation of uncharacterized receptors, and development of more effective drugs with fewer side effects.

A. Flock T*, Hauser AS, Lund N, Gloriam DE, Balaji S, **Babu MM***. Selectivity determinants of GPCR-G-protein binding. *Nature*. 2017. 545(7654):317-322. doi: 10.1038/nature22070. PubMed Central PMCID: PMC5846738.

B. Venkatakrisnan AJ*, Deupi X, Lebon G, Heydenreich FM, Flock T, Miljus T, Balaji S, Bouvier M, Veprintsev DB, Tate CG, Schertler GF, **Babu MM***. Diverse activation pathways in class A GPCRs converge near the G-protein-coupling region. *Nature*. 2016. 536(7617):484-7. PubMed Central PMCID: PMC5008462.

- C. Flock T*, Ravarani CNJ, Sun D, Venkatakrishnan AJ, Kayikci M, Tate CG, Veprintsev DB, **Babu MM***. Universal allosteric mechanism for G α activation by GPCRs. *Nature*. 2015. 524(7564):173-179. doi: 10.1038/nature14663. PubMed Central PMCID: PMC4866443.
- D. Venkatakrishnan AJ*, Deupi X, Lebon G, Tate CG, Schertler GF, **Babu MM***. Molecular signatures of G-protein-coupled receptors. *Nature*. 2013. 494(7436):185-94. doi: 10.1038/nature11896. PMID: 23407534.
- F. Hauser AS*, Chavali S, Masuho I, Jahn LJ, Martemyanov KA, Gloriam DE, **Babu MM***. Pharmacogenomics of GPCR Drug Targets. *Cell*. 2018. 172(1-2):41-54. doi: 10.1016/j.cell.2017.11.033. PubMed PMID: 29249361
- G. Marti-Solano, M., Crilly, S. E., Malinverni, D., Munk, C., Harris, M., Pearce, A., Quon, T., Mackenzie, A. E., Wang, X., Peng, J., Tobin, A. B., Ladds, G., Milligan, G., Gloriam, D. E., Puthenveedu, M. A. & Babu, M. M. Combinatorial expression of GPCR isoforms affects signalling and drug responses. *Nature* 587, 650-656, (2020). doi: 10.1038/s41586-020-2888-2. PMID: 33149304.

Contributions to establishing the importance of unstructured protein regions in biology

My group develops data science-based approaches to reveal fundamental principles in biological systems. We have developed computational and machine learning approaches to interrogate large-scale biological data from diverse organisms. Intrinsically disordered regions (IDRs) in proteins are abundant in organisms (~40% in humans). Since IDRs are not amenable to classical structural biology methods, they have been difficult to study experimentally. Through a combination of genome-scale computational approaches, big-data analysis, machine learning and experimental validation, our group helped establish the role of IDRs in biology. Together, these findings established the functional versatility of disordered proteins and their role in rewiring biological networks across space (sub-cellular locations, tissues and individuals in a population) and time (cell-division, developmental and evolutionary time-scale). In this way, our work has contributed to how disordered regions contribute to phenotypic diversity on multiple scales – cells, tissues, and organisms.

- A. Buljan, M.*, Chalancon, G., Eustermann, S., Wagner, G. P., Fuxreiter, M., Bateman, A., & **Babu, M. M.*** (2012). Tissue-specific splicing of disordered segments that embed binding motifs rewires protein interaction networks. *Mol Cell*, 46(6), 871-883. doi:10.1016/j.molcel.2012.05.039. PubMed Central PMCID: PMC3437557
- B. Weatheritt, R. J.*, Gibson, T. J., & **Babu, M. M.*** (2014). Asymmetric mRNA localization contributes to fidelity and sensitivity of spatially localized systems. *Nat Struct Mol Biol*, 21(9), 833-839. doi:10.1038/nsmb.2876. PubMed Central PMCID: PMC4167633
- C. van der Lee, R.*, Lang, B., Kruse, K., Gsponer, J., Sanchez de Groot, N., Huynen, M. A., Matouschek, A., Fuxreiter, M., & **Babu, M. M.*** (2014). Intrinsically disordered segments affect protein half-life in the cell and during evolution. *Cell Rep*, 8(6), 1832-1844. doi:10.1016/j.celrep.2014.07.055. PubMed Central PMCID: PMC4358326
- D. Chavali, S.*, Chavali, P. L., Chalancon, G., de Groot, N. S., Gemayel, R., Latysheva, N. S., Ing-Simmons, E., Verstrepen, K. J., Balaji, S., & **Babu, M. M.*** (2017). Constraints and consequences of the emergence of amino acid repeats in eukaryotic proteins. *Nat Struct Mol Biol*, 24(9), 765-777. doi:10.1038/nsmb.3441. PubMed Central PMCID: PMC5603276

Contributions to establishing the importance of unstructured protein regions in disease

The papers below establish the following points. i) Unstructured proteins are tightly regulated from transcript synthesis to protein degradation. This explains how their detrimental effects associated with neurodegeneration such as protein aggregation are minimised. ii) Genes coding for disordered regions are a major source of cancer gene fusions. This explains how constitutively rewiring signalling networks causes diverse forms of cancer. iii) Viruses mimic host-like disordered regions and cause imbalance in cellular networks by sequestering their interaction partners. This explains how they can hijack the host's cellular processes through molecular mimicry, disturb cellular networks and cause infection.

- A. Gsponer, J.*, Futschik, M. E., Teichmann, S. A., & **Babu, M. M.*** (2008). Tight regulation of unstructured proteins: from transcript synthesis to protein degradation. *Science*, 322(5906), 1365-1368. doi:10.1126/science.1163581. PubMed Central PMCID: PMC2803065.

B. Gsponer, J.* & **Babu, M. M.*** (2012). Cellular strategies for regulating functional and nonfunctional protein aggregation. *Cell Rep*, 2(5), 1425-1437. doi:10.1016/j.celrep.2012.09.036. PubMed Central PMCID: PMC3607227

C. Latysheva, N. S.*, Oates, M. E., Maddox, L., Flock, T., Gough, J., Buljan, M., Weatheritt, R. J., & **Babu, M. M.*** (2016). Molecular Principles of Gene Fusion Mediated Rewiring of Protein Interaction Networks in Cancer. *Mol Cell*, 63(4), 579-592. doi:10.1016/j.molcel.2016.07.008. PubMed Central PMCID: PMC5003813.

D. Hagai, T., Azia, A., **Babu, M. M.***, & Andino, R.* (2014). Use of host-like peptide motifs in viral proteins is a prevalent strategy in host-virus interactions. *Cell Rep*, 7(5), 1729-1739. PubMed Central PMCID: PMC4089993.

Contributions to the development of high-throughput approaches to discover functions of disordered regions encoded in the genome of any organism, natural variations within them, and disease genomes

We have developed a technology (IDR-Screen) that exploits next generation sequencing to simultaneously assay vast libraries of sequences (~millions) that code for IDRs by coupling IDR sequence (genotype) to any selectable function (phenotype), and to identify functional variants through a selection experiment. We develop state-of-the-art machine learning algorithms to discover systematic rules that govern how sequences determine functions in disordered regions. In this proposal, we will leverage the ML framework to understand the relationship between sequence properties, conformational/material properties and phase separation.

A. Ravarani, C. N.*, Erkina, T. Y., De Baets, G., Dudman, D. C., Erkine, A. M.* & **Babu, M. M.*** (2018). High-throughput discovery of functional disordered regions: investigation of transactivation domains. *Mol Syst Biol*, 14(5), e8190. doi:10.15252/msb.201881907. PubMed Central PMCID: PMC5949888.

4. Professional Career

Group Leader (Tenure-track) Structural Studies Division MRC Laboratory of Molecular Biology Cambridge, United Kingdom	2006-2010
Programme Leader (Tenured) Structural Studies Division MRC Laboratory of Molecular Biology Cambridge, United Kingdom	2010-2020
Director of Studies Trinity College, University of Cambridge Cambridge, United Kingdom	2011-2015

5. Professional Memberships

- Member of International Society for Computational Biology, USA 2001-present
- Member of American Society of Biochemistry and Molecular Biology, USA 2021-present
- Member of the Biophysical Society, USA 2018-present
- Member of the Genetics Society, UK 2018-present
- Member of the Biochemical Society, UK 2008-present
- Member of the Society of Biological Chemists, India 2001-present
- Member of the Computer Society of India, India 2001-present

6. Editorial Board Appointments

- Editorial Board Member of Molecular Biosystems, A Royal Society Chemistry Journal 2007
- Editorial member, Biology Direct 2008-present
- Associate Editor at Molecular BioSystems, RSC Journals 2010-2017
- Executive Editor at Nucleic Acids Research, OUP Journals 2010-present
- Editor, Molecular BioSystems special issue on IDPs 2012

- Joint section editor for Current Opinion in Structural Biology 2014
- Editorial Board Member of the Journal of Structural Biology 2015-2016
- Editor for the Models of Life special Issue at Molecular BioSystems 2015
- Associate Editor, Annual Reviews in Biomedical Data Sciences 2016-present
- Editorial member Biophysical Journal 2017-present
- Editorial member EMBO Life Sciences Alliance 2018-present
- Editor of the four-part lecture series on GPCRs by Henry Stewart Talks 2019-present
- Chief Editor of Molecular Systems Biology, an EMBO Press Journal 2019-2022

7. Grant Review / Study Activities

- Panel member for the evaluation of IMB Mainz, Germany 2021
- Panel member for the evaluation of Bioinformatics Programme, CRG, Barcelona 2017
- Panel member for the evaluation of Computational and Structural Biology Unit, EMBL, Heidelberg, Germany 2018
- Panel member for the evaluation of CIRB, College de France 2017
- International Advisory member and member of the Scientific Advisory Board for Integrative Biology unit at the MRC London Institute of Medical Sciences, UK 2016-present
- International Advisory member of Integrative Centre for Computational Biosciences, Mahidol University, Thailand 2014-present
- International Advisory member of ATLAS, Odense 2017-present
- International Advisory member of MS University of Baroda, India 2014-present
- NIH funded program on E. coli systems biology 2009
- STATegra, a FP7 programme on methods development for data integration 2013-present
- Phyre programme for structure prediction, Imperial College, UK 2012
- Member of the UK NHS and Genomics England Pharmacogenomics workgroup 2018-present
- F1000 Member 2013-present
- Member of Human Genome Organization (HUGO) 2010-2013
- *Ad hoc* Consultant for DeepMind (2021-), GPCR Newco (2020-), Syncona (2018-), OMass Technologies (2018-), Ahren (2018), Genentech (2012-)
- Expert Reviewer: ERC Advanced grant, ERC Consolidator grant, ERC Starting grant, College of reviewers for Canadian Research Council; NSF, USA; German-Israeli Science Foundation; Israel Science Foundation; Department of Biotechnology India; SHARCNET Canada; MRC, BBSRC, EPSRC, UK; EMBO fellowship, Germany; CNRS ATIP program France; Newton Trust, UK; Netherlands organization for scientific research, Netherlands; Danish Research Foundation, Denmark; FWO, Belgium.

8. Evaluation Committees and Journal Review

- PhD thesis examiner for 37 PhD students (16 Cambridge, 2 Belgium, 10 India, 4 rest of UK, 1 Norway; 1 Sweden; 1 Denmark; 3 Israel).
- Expert evaluator for the promotion of faculty members at Weizmann Institute (1), Tel Aviv University (1), University of Laval, Canada (2), NCBS, India (1), Southampton (1), MRC (1), University of Edinburgh (1); Faculty job applications at various institutes (10 scientists)
- Evaluator for Helmholtz Association's Schrodinger prize, Wolfson, Corpus Christi and Darwin College research fellowships, UK
- Expert reviewer for over 25 different scientific journals including Nature, Science, Cell, PNAS, Nature Genetics, Nature Neuroscience, Nature Methods, Nature Nanotechnology, Nature Protocols, Science Signaling, Science Advances, Molecular Cell, Cell Reports, Structure, PLoS Biology, Molecular Systems Biology, Genome Research, Blood, Genome Biology, PLoS Computational Biology, Journal of Molecular Biology, Trends in Genetics, Trends in Microbiology, Nucleic Acids Research, PEDS.

9. Honors and Awards

- National Merit Scholarship, India 1997
- Indian Institute of Science Young Fellow, India 1997
- Indian Academy of Sciences, India 1998
- University Gold Medal, Anna University, India 2001
- External Research Scholar, Trinity College, Cambridge, UK 2001
- LMB Cambridge Fellowship, MRC Lab of Molecular Biology, Cambridge, UK 2001

- Max Perutz Prize: MRC Laboratory of Molecular Biology, UK 2004
- Rouse Ball Fellowship: Trinity College, Cambridge, UK 2004
- Schlumberger Interdisciplinary Research Fellow: Darwin College, University of Cambridge, UK 2007
- Genomics Pioneers Special Award: Awarded by HUGO, UK, Genelogic and Ocimum, USA 2008
- Biochemical Society Early Career Award: Biochemical Society, UK 2009
- EMBO Young Investigator: European Molecular Biology Organization Germany 2010
- Molecular BioSystems Award: Royal Society of Chemistry, UK and American Chemical Society, USA 2011
- Balfour Prize: British Genetics Society, UK 2011
- Danny Thomas Lecture and Visiting Professorship: St Jude's Children's Research Hospital, Memphis, TN USA 2012
- Colworth Medal: Biochemical Society, UK 2013
- Lister Institute Research Prize: Lister Institute of Preventive Medicine, UK 2014
- Protein Science Young Investigator Award: Protein Society, USA 2014
- Francis Crick Medal and Lecture: The Royal Society, UK 2015
- Elected member of EMBO: European Molecular Biology Organization 2016
- Adjunct Professor: University of Southern Denmark, Odense, Denmark 2017
- Fellow of the Royal Society of Chemistry: Royal Society of Chemistry, UK 2017
- Blavatnik Awards UK Life Sciences Laureate: Blavatnik Foundation and New York Academy of Sciences, UK 2018
- ISCB Innovator Award: International Society for Computational Biology, USA 2018
- EMBO Gold Medal: European Molecular Biology Organization, Germany 2019
- Fellow of the Academy of Medical Sciences 2021

10. Institutional and Committee Assignments

- Member of Darwin College General Body Committee 2007-2010
- MRC LMB Structural Studies Divisional Committee 2015-2020
- Executive Committee 2020-present
- Data Science Taskforce 2021-present
- Search Committee for Scientific Director 2021-Present
- Search Committee for Chair of Infectious Diseases 2021-present
- St Jude Strategic Planning Committee 2020-present
- Committee for Diversity and Inclusion 2020-present
- Mentoring Committee for Assistant Members
Paul Geeleher, Ji Sun, and Chia Hseu Lee, and Tudor Moldovaneu 2020-present
- Promotion Committee for Jiang Yu 2021

11. Professional Administrative Services

Co-organized 9 international conferences

- Quantitative Biology: from complex networks to simple models, Montauk (Co-organizer) 2010
- Quantitative Methods in Gene Regulation at the Institute of Physics, London (Co-organizer) 2011
- Gordon Research Conference on Intrinsically Disordered Proteins (Vice-Chair) 2012
- Cold Spring Harbor Asia Conference on Computational Biology (Co-organizer) 2013
- Gordon Research Conference on Intrinsically Disordered Proteins (Chair) 2014
- Spetses Summer School on Proteins and Organized Complexity, Spetses, Greece 2017
- Intrinsically Disordered Proteins, Annual Biophysical Society meeting (Co-chair) 2017
- Intrinsically Disordered Proteins, Biophysical Society meeting, USA 2020
- Biophysical Society meeting on Biophysical approaches to study coronavirus, USA 2021

Co-organized/Co-chaired 5 sessions in international conferences

- PLoS regulation track of ISMB 2007, Vienna, Austria 2007
- Regulatory Genomics, RECOMB 2010, USA 2010
- Systems Biology Session at the 17th International Biophysics Congress, Beijing 2011
- Motifs in Biology, Biophysical Society Meeting in Dublin 2014
- Gordon Research Seminar, Switzerland 2016

Member of conference organizing committee for 11 international conferences

- Committee member for Dialogue on Reverse Engineering Assessment & Methods 2007-2013
- Scientific advisory member for BioSysBio, UK 2008-2009
- Committee member for RECOMB regulatory genomics 2008-2016
- Committee member for Workshop on Complex Networks 2010-2011

12. Formal Education/Teaching Activities

- Lecture module on genome evolution and gene regulation to Genetics Department students and PLM lecture series (Nov 2008)
- Lecture module on interaction networks and protein disorder to PhD students at the Wellcome Trust course (Oct 2010)
- Lecture module on computational approaches to investigate problems in biology, LMB PhD students lecture (2010, 2011, 2012)
- Lecture module on biological networks and transcription networks to Part III Systems Biology students (Sep 2010-2014)
- Supervision of undergraduate students in Biochemistry and Molecular Biology & Cell and Developmental Biology at Trinity College, University of Cambridge, UK (6 hours per week during term time from Oct 2011 – Oct 2015)
- 3-hour lecture + 2-hour discussion on systems biology at the Spetses Summer School (2009, 2013 and 2017)
- Lecture module on protein disorder, regulation and disease to Part III Systems Biology students (2010-now)
- St Jude Graduate School (Two lectures per year for PhD students)

Past Members (3 Staff, 21 Post-Docs, 14 PhD students, 2 MPhil students, co-supervisor for 12 PhD students)

Current positions of alumni in Academia and Medicine (20 trainees)

- Dr Sarath Chandra Janga (MRC PhD student from 2008–11; Associate Professor at Indiana University, USA)
- Dr Subhajyoti De (joint Post-Doc mentor 2007-09 Associate Professor at Rutgers University, USA)
- Dr Joerg Gsponer (joint Post-Doc mentor 2007-09; Professor at UBC, Canada)
- Dr Marija Buljan (Post-Doc from 2011-13; Group Leader, EMPA, Switzerland)
- Dr Marc Torrent (MC Post-Doc Fellow 2011-14; Assistant Professor at UAB, Barcelona)
- Dr Sreenivas Chavali (EMBO Fellow and Investigator Scientist from 2012-18; Assistant Prof at IISER, India)
- Dr Balaji Santhanam (Senior Investigator Scientist 2012-20; currently Group Lead at St Jude)
- Dr Robert Weatheritt (MC Post-Doc Fellow 2013-17; Group Leader in EMBL Australia)
- Dr Pavithra Chavali (Investigator Scientist from 2016-19; Group Leader at CCMB, India)
- Dr Benjamin Lang (Herschel Smith PhD student and Post-Doc from 2008-12; Staff Scientist at St Jude)
- Dr Daniel Prado (MRC PhD student and Post-Doc from 2014-19; post-doc at St Jude)
- Dr Andrew Deonarine (MRC PhD student from 2011-13; clinical data scientist at XY.AI)
- Dr Alex Gunnarsson (MRC PhD student and Post-Doc from 2015-20; post-doc at St Jude)
- Dr Duccio Malinverni (SNF Post-Doc Fellow from 2018-20; currently Staff Scientist at St Jude)
- Dr Rekin's Janky (Post-Doc from 2008–12; Staff Scientist, Belgium)
- Dr Natalie de Groot (FEBS and MC Post-Doc Fellow 2010–14; scientist at CRG, Barcelona)
- Dr Rita Pancsa (EMBO Post-Doc Fellow 2015-17; Scientist ELU, Hungary)
- Dr Kai Kruse (MRC PhD student from 2010–13; Post-Doc, Max Planck)
- Ms Alissa Hummer (MRC MPhil student from 2019-20; PhD student at Oxford)
- Mr William Orchard (MRC MPhil student from 2019-20; PhD student at Cambridge)
- Andrew Kleist, MD PhD (MRC Lister Institute Visiting PhD Student at Cambridge)

Current positions of alumni in Data Science Companies, Pharmaceutical Industry, Start up and Science Policy (13 trainees)

- Dr Arthur Wuster (MRC PhD student from 2006–09; Associate Director, Biomarin Pharmaceuticals)
- Dr Katherine Weber (NSF joint PhD student from 2007-10; Policy Lead for AI Research at Google; Science and Technology policy officer at the US Department of State)
- Dr A J Venkatakrishnan (LMB PhD student and Post-Doc from 2009–12; Director of Research and Partnerships at Nference)
- Dr Guilhem Chalancon (MRC PhD student and Post-Doc from 2011-14; Head of Data Science, Realeyes AI)
- Dr Sven Sewitz (MRC Post-Doc from 2011-12; Head of Biodata innovation, Eagle Genomics)
- Dr Greet de Baets (MC Fellow from 2015-17; Associate Principal Scientist, AstraZeneca)
- Dr Tilman Flock (BI PhD student and Post-Doc from 2012-16; AI Deployment Strategist, Palantir Technologies)

- Dr Charles Ravarani (ANR funded PhD student and Post-Doc from 2015-17; Chief Technology Officer, Biotx.AI)
- Dr Natasha Latysheva (MRC PhD student from 2013-16; Research Engineer, DeepMind)
- Dr Melis Kayikci (Investigator Scientist from 2014-18; Software Engineer, Genomics England)
- Dr Andal Murthy (Investigator Scientist from 2016-19; Senior Scientist at Astra Zeneca)
- Dr Marion Ouedraogo (2013-15; CEO, Ornitorink)
- Mr Alexey Morgunov (MRC PhD student from 2014-17; break from PhD; CEO, Manifold Research)

Sabbatical visitors

- Prof. Daniela Rhodes (2017; NTU, Singapore)
- Prof. Arthur Lesk (2016-2017; 2018; Penn State University, USA)
- Prof. Richard Rottger (2017; USD, Denmark)
- Prof. Mark Bayfield (2016; York University, Toronto)
- Prof. Alex Erkin (2015; Butler University, USA)
- Prof. Monika Fuxreiter (2010; U. Debrecen, Hungary)
- Dr. Matthias Futschik (2008; Imperial College, London)

MRC Laboratory of Molecular Biology, Cambridge, UK

2006-present

- Post-Doctoral Scientists: Dr Xiaohan Li (2017-2020; MC Fellow)
- Dr Maria Marti (2018-2021; MC Fellow)
- Dr Greg Slodkowitz (2018-2020; AZ Fellow)
- Dr Yonathan Goldtzwick (2019-2021; EMBO Fellow)
- Dr Franziska Heydenreich (2020-2023; MC Fellow)
- PhD Students: Mr Johannes T Habrecht (2015-20)

St Jude Children's Research Hospital, Memphis, USA

2020-Present

- Director of Lab Operations: Dr. Benjamin Leslie
- Group Lead: Dr. Balaji Santhanam
- Staff Scientists: Dr. Benjamin Lang, Dr. Duccio Malinverni, Dr. Besian Sejdiu, Cristina Guibao
- Post-Doctoral Scientists: Dr. Manbir Sandhu, Dr. Assaf Elazar, Dr. Daniel Prado, Dr. Alex Gunnarsson

13. Grant Awards

A. Active Grants:

Kinase Blue Sky at St Jude (w B. Kalodimos)	2021-2027
Alex Lemonade Foundation: Crazy 8 (w C. Mullighan and team)	2021-2025
St Jude Core Funding	2020-present
RO1-Multi PI CA246125-01 (w. R. Kriwacki)	2019-2024
Nova Nordisk Foundation Challenge Grant (w S. Mandrup)	2019-2025

B. Completed Grants:

MRC Core Funding	2006-2020
HFSP International Grant	2010-2013
ERC/ERASYSBIO+	2010-2013
EMBO Young Investigator Grant	2010-2013
Lister Institute Research Prize	2015-2020
Astra Zeneca Blue Sky Project (PI) \$200K GBP	2018-2020
European Research Council Consolidator Grant	2016-2020

Support of over £2 million has come through various group members having obtained over 15 of the following competitive funding from UK and international agencies to work in my group: Marie Curie Fellowship (x7), FEBS fellowship (x2), EMBO Long term fellowship (x3), INRA (x1), Beatriu de Pinos (x1), Fonds National de la Recherche Luxembourg (x1), Gates Scholarship (x1), Knox Fellowship (x1), Boehringer Ingelheim Fonds Fellowship (x1), Wiener-Anspach foundation Fellowship (x1), Cambridge European Trust (x3), National Science Foundation Fellowship (x1), LMB Cambridge Scholarship (x2), Medical Research Council Centenary Award (x2), Wolfson College Fellowship (1), Kings College Fellowship (1), Darwin College Fellowship (1), Fitzwilliam College Fellowship (1), Swiss National Fellowship (1)

14. Publication Record

G-Protein Coupled Receptor Signaling Publications

- 1 Venkatakrisnan, A. J., Deupi, X., Lebon, G., Tate, C. G., Schertler, G. F. & Babu, M. M. Molecular signatures of G-protein-coupled receptors. *Nature* 494, 185-194, (2013). doi: 10.1038/nature11896. PMID: 23407534.
- 2 Venkatakrisnan, A. J., Flock, T., Prado, D. E., Oates, M. E., Gough, J. & Babu, M. M. Structured and disordered facets of the GPCR fold. *Curr Opin Struct Biol* 27, 129-137, (2014). doi: 10.1016/j.sbi.2014.08.002. PMID: 25198166.
- 3 Flock, T., Ravarani, C. N., Sun, D., Venkatakrisnan, A. J., Kayikci, M., Tate, C. G., Veprintsev, D. B. & Babu, M. M. Universal allosteric mechanism for Galpha activation by GPCRs. *Nature* 524, 173-179, (2015). doi: 10.1038/nature14663. PMID: 26147082.
- 4 Sun, D., Flock, T., Deupi, X., Maeda, S., Matkovic, M., Mendieta, S., Mayer, D., Dawson, R. J., Schertler, G. F., Babu, M. M. & Veprintsev, D. B. Probing Galpha1 protein activation at single-amino acid resolution. *Nat Struct Mol Biol* 22, 686-694, (2015). doi: 10.1038/nsmb.3070. PMID: 26258638.
- 5 Venkatakrisnan, A. J., Deupi, X., Lebon, G., Heydenreich, F. M., Flock, T., Miljus, T., Balaji, S., Bouvier, M., Veprintsev, D. B., Tate, C. G., Schertler, G. F. & Babu, M. M. Diverse activation pathways in class A GPCRs converge near the G-protein-coupling region. *Nature* 536, 484-487, (2016). doi: 10.1038/nature19107. PMID: 27525504.
- 6 Flock, T., Hauser, A. S., Lund, N., Gloriam, D. E., Balaji, S. & Babu, M. M. Selectivity determinants of GPCR-G-protein binding. *Nature* 545, 317-322, (2017). doi: 10.1038/nature22070. PMID: 28489817.
- 7 Hauser, A. S., Chavali, S., Masuho, I., Jahn, L. J., Martemyanov, K. A., Gloriam, D. E. & Babu, M. M. Pharmacogenomics of GPCR Drug Targets. *Cell* 172, 41-54 e19, (2018). doi: 10.1016/j.cell.2017.11.033. PMID: 29249361.
- 8 Kayikci, M., Venkatakrisnan, A. J., Scott-Brown, J., Ravarani, C. N. J., Flock, T. & Babu, M. M. Visualization and analysis of non-covalent contacts using the Protein Contacts Atlas. *Nat Struct Mol Biol* 25, 185-194, (2018). doi: 10.1038/s41594-017-0019-z. PMID: 29335563.
- 9 Masuho, I., Chavali, S., Muntean, B. S., Skamangas, N. K., Simonyan, K., Patil, D. N., Kramer, G. M., Ozelius, L., Babu, M. M. & Martemyanov, K. A. Molecular Deconvolution Platform to Establish Disease Mechanisms by Surveying GPCR Signaling. *Cell Rep* 24, 557-568 e555, (2018). doi: 10.1016/j.celrep.2018.06.080. PMID: 30021154.
- 10 Sente, A., Peer, R., Srivastava, A., Baidya, M., Lesk, A. M., Balaji, S., Shukla, A. K., Babu, M. M. & Flock, T. Molecular mechanism of modulating arrestin conformation by GPCR phosphorylation. *Nat Struct Mol Biol* 25, 538-545, (2018). doi: 10.1038/s41594-018-0071-3. PMID: 29872229.
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- 167 Seshasayee, A. S. & Babu, M. M. in *Encyclopedia of Genetics, Genomics, Proteomics and Bioinformatics* (2005).
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- 175 Chalancon, G., Kruse, K. & Babu, M. M. in *Encyclopedia of Systems Biology* (eds Werner Dubitzky, Olaf Wolkenhauer, Kwang-Hyun Cho, & Hiroki Yokota) 1263-1267 (Springer New York, 2013).

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Books

- 179 Babu, M. M. 310 (Caister Academic Press, 2013).

15. Presentations

A. Oral Presentations

2006

- Invited lecturer for an international conference on “Evolutionary Systems Biology” – Natural History Museum, London – Oct 2006

2007

- Invited lecture at Bielefeld University Life Sciences seminar series: Bielefeld, Germany – Jan 2007.
- Invited lecturer at the Biowire 2007 conference: Cambridge, UK – Apr 2007
- Invited lecturer: “Exploring new paths in computational Biology” conference, Lyon, France – May 2007.
- Keynote speaker at the Benelux Bioinformatics Conference, Leuven, Belgium – Nov 2007
- Invited lecturer for the “International Conference in Bioinformatics”, Spain – Nov 2007
- Invited lecturer at Jacobs University Life Sciences seminar series: Bremen, Germany – Nov 2007
- Invited speaker at the Physics of Living Matter: Cambridge, UK – Nov 2007

2008

- Invited speaker at the Honda Research Institute, Offenbach, Germany – Jan 2008
- Invited speaker at the Biochemistry Department, Cambridge, - February 2008
- Invited speaker at the Center for Clinical Sciences, Imperial College, UK – March 2008
- Invited speaker at the Biochemical Society's 2008 meeting on Gene Expression and Analysis: Manchester, UK – Mar 2008
- Invited speaker at the Royal Netherlands Academy of Arts and Sciences Colloquia: Amsterdam, Netherlands – May 2008
- Invited speaker at the Center for Regulatory Genomics, Barcelona, Spain – May 2008
- Honda Research Center, Germany – Jan 2008
- Department of Biochemistry, Cambridge – Feb 2008
- MRC Clinical Sciences Centre, London – Mar 2008
- Biochemical Society Meeting on Transcription and Translation – Mar 2008
- Royal Netherlands Academy of Arts and Sciences – May 2008
- Centre for Regulatory Genomics, Barcelona, Spain – Jul 2008
- CDFD, an Indian National Institute, Hyderabad, India – Sep 2008
- University of Hyderabad, India – Sep 2008
- Tata Consultancy Services, Hyderabad, India – Sep 2008
- HUGO Satellite meeting on Bioinformatics – Sep 2008
- HUGO meeting on Genome Evolution – Sep 2008
- Cambridge Neuroscience Symposium – Oct 2008
- Department of Genetics, Physics of Living Matter, Cambridge – Nov 2008

2009

- MRC Human Genetics Unit, Edinburgh – Dec 2008
- Department of Chemistry, Biophysics Colloquium, Cambridge – Feb 2009
- Bioinformatics Lecture series at the Institute of Gulbenkian, Portugal – Apr 2009
- GIGA-R Lecture, Brussels – Jun 2009
- GENNETEC/ICTP conference on transcriptional regulation, Trieste, Italy – Jun 2009
- CECAM conference on Systems Biology, Lausanne, Switzerland – Jun 2009
- Student Symposium of the University of Montreal on Cancer Systems Biology – Jul 2009
- Student Symposium at the CoMPLEX centre, University College London – Jul 2009
- Spetsai Summer School, Greece – Sep 2009

- Summer School on Evolution of Developmental Pathways, Venice – Sep 2009
- Physical Principles of Protein Behaviour, Dresden, Germany – Oct 2009
- Keystone Conference on Computational Genomics – Mar 2010
- Department of Chemistry, Biophysics Colloquium, Cambridge, UK – Feb 2009
- GIGA-Research Institute Lecture, Liege, Brussels – Jun 2009
- International Center for Theoretical Physics conference on transcriptional regulation, Trieste, Italy – Jun 2009
- EMBO conference, Zagreb, Croatia – Jun 2009
- CECAM conference on Systems Biology, Lausanne, Switzerland – Jun 2009
- Center for Regulatory Genomics, Barcelona, Spain – Jul 2009
- Student Symposium of the University of Montreal on Cancer Systems Biology, Montreal, Canada – Jul 2009
- Spetsai Summer School, Spetses, Greece – Sep 2009
- Student Symposium at the CoMPLEX centre, University College London, UK – Nov 2009
- Physical Principles of Protein Behaviour, Dresden, Germany – Oct 2009
- University of Liverpool, UK – Dec 2009
- Keynote Lecture at the Benelux Bioinformatics Conference, Liege, Belgium – Dec 2009

2010

- Keynote speaker at Evolution of Complex Systems, IISc, Bangalore, India – Jan 2010
- Keynote speaker at Protein evolution, Mahabaleshwar, Bangalore, India – Feb 2010
- Keystone Conference on Computational Genomics, Quebec City, Canada – Mar 2010
- Keynote Speaker at Award Lecture: Biochemical Society Meeting, York, UK – Mar 2010
- Society for General Microbiology Annual meeting, Edinburgh, UK – Mar 2010
- MRC Human Genetics Unit, Edinburgh, UK – Apr 2010
- Prague National Academy meeting on Proteins – May 2010
- EMBO Young Investigator Award Lecture, Heidelberg, Germany – May 2010
- Evolution of G Protein Coupled Receptors, North Carolina, USA – May 2010
- Gordon Research Conference on Unstructured Proteins, North Carolina, USA – Jul 2010
- Keynote Speaker at Complex Disease Analysis, Leuven, Belgium – Aug 2010
- Department of Biochemistry, University of Cambridge, 29 Sep 2010
- IRB Barcelona Biomedical Center, Barcelona, Spain – Oct 2010
- Keynote Speaker at CompleNet, International Workshop on Complex Networks, Rio de Janeiro, Brazil – Oct 2010
- Welcome Trust Advanced courses lecture at the Sanger Center, Hinxton, UK – Oct 2010
- Keynote Speaker at Early Career Award Lecture at the Charles Darwin House, London, UK – Nov 2010
- Fabrics of Life communicating science to art students, St Martins College of Art & Design, London – Nov 2010

2011

- University of Luxembourg, Luxembourg – Feb 2011
- MRC Clinical Sciences Center, London, UK – Feb 2011
- Cancer Research Institute, Cambridge, UK – Feb 2011
- Keynote Speaker at American Chemical Society and RSC's Molecular BioSystems Award Lecture, Anaheim, CA – Mar 2011
- Keynote Speaker at IBEST Lecture at the University of Idaho – Apr 2011
- Keynote Speaker at EMBO Lecture at the Argentine Association for Bioinformatics – May 2011
- Keynote Speaker at Institute of Structural and Molecular Biology Retreat, Robinson College, Cambridge, UK – Jun 2011
- University College London Cancer Biology, London, UK – Jun 2011
- Keynote Lecture at the UCL and Birkbeck College's Institute of Structural and Molecular Biology retreat – Jun 2011
- EMBO Systems Biology conference, Heidelberg, Germany – Jul 2011
- Keynote Speaker at 17th European Meeting of PhD students in Evolutionary Biology, Seia, Portugal - Aug 2011
- Genome Biology and Evolution, Oeiras Summer Schools in Evolutionary Biology, Lisbon, UK – Aug 2011
- Signals and Space: Spatiotemporal patterns in biosystems, Niels Bohr Institute, Copenhagen – Aug 2011
- Cambridge Networks Network kick-off meeting, Kings College, Cambridge, UK – Sep 2011
- Keynote Lecture at the European Conference on Complex Systems, Austria – Sept 2011
- IUPAB's 17th International Biophysics Congress, China – Oct 2011
- Keynote Speaker at Balfour Award Lecture at the Genetics Society meeting, Carlton House, Royal Society, London – Nov 2011

- Keynote Speaker at IGIB meeting on Genome Biology, Delhi, India – Dec 2011
- Danny Thomas Lecture at St Jude Children's Research Hospital, Memphis, TN – Dec 2011

2012

- Keynote Speaker at EMBO YIP lecture: Gordon Conference on Biomolecular Interactions, Galveston, USA – Jan 2012
- Babraham Institute, Cambridge, UK – Feb 2012
- Annual Biophysical Society Meeting, San Diego, USA – Feb 2012
- Biochemical Society Meeting on Disordered Proteins, York – Mar 2012
- Invited Speaker at IPCAT meeting at Trinity College, University of Cambridge, UK – Mar 2012
- Invited Speaker at HIBIT Cappadocia, Turkey – Apr 2012
- University of Florida, Florida, USA – May 2012
- EBI Networks and Pathways meeting, Cambridge, UK – May 2012
- CCBI Annual Symposium, Newton Institute and DAMTP, Cambridge, UK – May 2012
- MRC Molecular Hematology Unit, Oxford University – May 2012
- LMB Bioinformatics lecture for graduate students – Jun 2012
- Invited Speaker Danny Thomas Lecture at St Jude Children's Research Hospital, Memphis TN – Jun 2012
- Invited Speaker Structural Biology Departmental Seminar at St Jude Children's Research Hospital, Memphis TN – Jul 2012
- Vice Chair & discussion leader for the Gordon Conference on Intrinsically Disordered Proteins, Vermont, USA – Jul 2012
- Annual Protein Society Meeting, San Diego CA – Aug 2012
- Genentech, San Francisco, CA – Aug 2012
- Phenotypes to Pathway meeting – Sep 2012
- University of Texas at Austin, Austin TX – Sep 2012
- Keynote Speaker at Center for Biological Systems Engineering, Washington University at St Louis, St. Louis, MO – Sep 2012
- University of Texas at Southwestern, Dallas, TX – Sep 2012
- Evolution of structural and functional complexity, Kings College – Sep 2012
- Biochemistry Department, University of Cambridge – Sep 2012

2013

- GN Ramachandran Symposium at the Indian Institute of Science, Bangalore – Jan 2013
- American Physical Society Meeting, Washington DC – Mar 2013
- NIEHS, National Institute of Health, Institute Seminar, Durham NC – May 2013
- University Lecture at Mahidol University, Bangkok, Thailand – Sep 2013
- Spetses Summer School, Spetses, Greece – Sep 2013
- Department of Biochemistry, University of Cambridge – Nov 2013

2014

- Facilitator: MRC Clinical Sciences Fabric of Life, Central St Martins School of Arts, London. Linking Arts and Science – Jan 2014
- Biochemistry Lecture series, University of Liverpool – Mar 2014
- Max F Perutz Laboratory and University of Vienna – Mar 2014
- MedImmune visit to the LMB, Cambridge – Mar 2014
- Max Planck Institute, Munich, Germany – Apr 2014
- PhD student seminar series, Gene Center, University of Munich, Germany – Apr 2014
- Protein Society Award Lecture, Protein Society, San Diego, CA – Jul 2014
- Genentech, San Francisco, CA – Jul 2014
- International Center for Computational BioSciences, University of Mahidol, Thailand – Aug 2014
- AOHUPO workshop on protein science, Bangkok, Thailand – Aug 2014
- 9th Symposium of the Protein Society of Thailand – Aug 2014
- Lister Institute award lecture, Cambridge – Sep 2014
- Disordered Motifs and Domains in Cell Control, Biophysical Society, Ireland – Oct 2014
- Department of Biochemistry, University of Cambridge, UK – Oct 2014
- Colworth Lecture, Biochemical Society, London – Dec 2014

2015

- MRC LMB lecture for the non-scientific staff members – Jan 2015
- IGMM lecture, MRC Human Genetics Unit, University of Edinburgh – Feb 2015
- Dana Farber Cancer Institute, Harvard University – Mar 2015
- Visualizing Biological Data meeting at the BROAD institute, MIT, Boston – Mar 2015
- Keynote Lecture at the RECOMB: Research in Computational Molecular Biology, Warsaw – Apr 2015

- International Institute of Molecular and Cell Biology, Warsaw – Apr 2015
- Structural Biology Department seminar series, VIB, Brussels – Apr 2015
- Institute of Cancer Research, London - May 2015
- Colworth Prize Lecture at Unilever – May 2015
- Druggability of IDPs conference in Ionnina, Greece – Jun 2015
- Models of Life conference in Krogerup, Denmark – Aug 2015.
- Keynote lecture at ARCSB-TRISYS meeting in Kuala Lumpur, Malaysia – Sep 2015
- University of Mahidol, Bangkok, Thailand – Sep 2015
- Keynote lecture at the opening ceremony of NIMBELS Institute in NTU, Singapore – Sep 2015
- Lecture at the Linderstrom-Lang Center opening, Copenhagen, Denmark – Nov 2015
- Lecture at the University of Southern Denmark, Odense – Nov 2015
- Department of Biochemistry, University of Cambridge, UK – Nov 2015

2016

- MRC Clinical Sciences Workshop, London – Mar 2016
- Keynote lecture at the GRC on disordered proteins, Switzerland – Jun 2016
- Saarbruecken University, Saarland Germany – Jul 2016
- Astra Zeneca, Cambridge – Jul 2016
- EMBO Workshop on Modules in signaling proteins and networks, Seefeld, Austria – Sep 2016
- 17th GPCR Retreat, Chicago, USA – Oct 2016
- CIFAR meeting on Molecular Architectures of Life & 4th iHUMAN GPCR meeting Shanghai – Nov 2016
- University of Southern Denmark seminar, Odense Denmark – Dec 2016
- Delivered the Francis Crick Lecture at the Royal Society, London – Dec 2016

2017

- Invited lecture at Genentech, San Francisco, USA – Feb 2017
- Chair's scientific remarks and synthesis of emerging ideas from the talks, Biophysical Society meeting – Feb 2017
- ISMB/UCL Institute seminar – Feb 2017
- Astbury Seminar, University of Leeds, Leeds, UK – Mar 2017
- Institute seminar, University of Southampton, Southampton, UK, June 2017
- EMBO Keynote lecture at the Asia Pacific Protein Association conference, Bangkok, Thailand, July 2017
- Spetses summer school, Spetses, Greece - Sep – Oct 2017
- EMBO new members talk, EMBO new members meeting, Heidelberg, Germany – Oct 2017
- Lecture at the opening of ATLAS Center, University of Southern Denmark, Odense – Nov 2017
- Genetics Society's Human Genome in Healthcare, Royal Society, London – Nov 2017

2018

- Advances and Retreats in Molecular Evolution – Singapore – Feb 2018
- Keystone meeting: GPCR Structure and Function, New Mexico – Feb 2018
- Blavatnik Awards Ceremony, V&A, London – Mar 2018
- Pharmacology Department, Karolinska Institute, Sweden – Mar 2018
- Biochemistry Department, Uppsala University, Sweden – Mar 2018
- Cell and Molecular Biology Department, Uppsala University, Sweden – Mar 2018
- VISTEC Lecture, Rayong, Thailand – Apr 2018
- British Pharmacological Society, 7th Focused Meeting on Cell Signaling, Nottingham – Apr 2018
- 2018 Annual ASBMB meeting, San Diego, CA – Apr 2018
- UCL Seminar series, UCL, London – Jun 2018
- ATLAS meeting, University of Southern Denmark, Odense, Denmark – Jun 2018
- GRC on Intrinsically Disordered Proteins, Les Diablerets, Switzerland – Jul 2018 (session chair remarks)
- ISMB Award Lecture, ISCB, Chicago, IL – Jul 2018
- Institute Seminar, Medical College of Wisconsin, Milwaukee, WI – Jul 2018
- Blavatnik Science Symposium, New York Academy of Sciences, New York – Jul 2018
- Plenary Lecture at the EMBO Workshop on in situ methods in cell biology and cellular biophysics, Berlin – Jul 2018
- EMBO conference on nuclear receptors and biological systems, Kolymbari, Greece – Sep 2018
- MRC-LMS seminar, MRC-LMS, London – Sep 2018
- Panel discussion with public: European Researchers EU Science night (Public Engagement) – Sep 2018
- British Society for Genomic Medicine, London – Oct 2018
- LMB lab talks week, MRC-LMB, Cambridge – Oct 2018
- Keynote lecture at the Proteins Day, European Bioinformatics Institute, Hinxton – Oct 2018
- Keynote Lecture, GPCR meeting (GDR3545), Strasbourg – Oct 2018

- Part III Lecture, Biochemistry Department, Cambridge – Nov 2018
- Distinguished Lecture, Max Planck Institute for Biochemistry, Martinsreid, Planegg, Germany – Nov 2018
- DUKE BME distinguished speaker seminar, Durham, NC – Nov 2018

2019

- St Jude Children's research hospital – Memphis, TN – Jan 2019
- Duke University, Durham, NC – Feb 2019
- Keynote Lecture at the CAPRI meeting, Hinxton – Apr 2019
- Opening Keynote Lecture at the Keystone Meeting on Proteomics and its Application to Translational and Precision Medicine, Sweden – Apr 2019
- VISTEC Lecture, Rayong, Thailand – May 2019
- Cancer Systems Biology meeting, Hinxton – Jun 2019
- Milner Institute Sandpit event round table discussion, Cambridge – Jun 2019
- OMass therapeutics, Oxford – Jul 2019
- Keynote Lecture at the 27th FAOBMB and 44th MSBMB meeting, Malaysia – Aug 2019
- Keynote Lecture at the EMBL-EBI structural bioinformatics workshop, Hinxton – Sep 2019
- GPCR Retreat, Bromont, Canada – Sep 2019
- EMBO Gold Medal Lecture at the EMBO new members meeting, Heidelberg – Oct 2019
- ADIPOSIGN meeting, Copenhagen – Oct 2019
- Society for Endocrinology meeting, Brighton – Nov 2019
- Centenary meeting of the Genetics Society, Edinburgh 14 Nov 2019
- Biochemistry Department, University of Cambridge – Nov 2019
- 21st PhD symposium, EMBL, Germany – Nov 2019
- GPCR workshop, Kona Island Dec 2019
- EMBO Gold Medal Lecture, ASCB-EMBO meeting, Washington DC, 9 Dec 2019

2020

- St Jude Children's Research Hospital, Faculty Retreat, Memphis, Feb 2020
- Biophysical Society meeting IDP Subgroup symposium, Feb 2020
- MRC Postdoctoral scientists career talk, Mar 2020
- ADIPOSIGN meeting seminar, Mar 2020
- Royal Society – Israeli Academy of Science & Humanity, Molecular Fabric of Life, Tel Aviv, Israel, Mar 2020

2021

- St. Jude Children's Research Hospital, CBT Seminar, Memphis TN, 4 Feb 2021
- 100-year Anniversary of Dept of Biochemistry at Indian Institute of Science, Bangalore, 21 Feb 2021
- Basel Computational Seminar, (Virtual) University of Basel, Biozentrum Switzerland, 1 March 2021
- Novel developments in the GPCR Field – The German Society of Pharmacologists (Virtual), Max Planck Institute for Heart and Lung Research. Bad Nauheim, Germany, 3 March 2021
- ENDO 2021 (Virtual) 23 March 2021
- The Science of Childhood Cancer Lecture Series at St. Jude Children's Research Hospital, Memphis TN, (Virtual) 15 April 2021
- St. Jude Comprehensive Cancer Center – Cancer Biology Program, (Virtual) St. Jude Children's Research Hospital, 16 April 2021
- Harvard Medical School Blavatnik Institute, Biological Chemistry & Molecular Pharmacology, 22 April 2021
- ADIPOSIGN spring meeting 2021 (Virtual), 26 April 2021
- City of Hope Student Invitation, May 2021

16. Other Creative Products

- Protein Contact Atlas: <https://www.mrc-lmb.cam.ac.uk/rajini/index.html>
Analyze and visualize non-covalent contacts from over 100,000 protein structures
Documentation:
<https://www.mrc-lmb.cam.ac.uk/rajini/about.html>
<https://www.mrc-lmb.cam.ac.uk/rajini/features.html>
<https://www.mrc-lmb.cam.ac.uk/rajini/disciplines.html>
- Human GPCR Isoforms: <https://gpcrdb.org/protein/isoforms>
Analyze the sequences and tissue expression for the different human GPCR isoforms
- Human GPCR Pharmacogenomics Resource: https://gpcrdb.org/mutational_landscape/statistics
Analyze and infer functional impact of genetic variation in human GPCRs
Documentation:

<http://docs.gpcrdb.org/variants.html#variation-statistics>
<http://docs.gpcrdb.org/variants.html#receptor-variant-browser>

- Estimated NHS Economic Burden: https://gpcrdb.org/mutational_landscape/economicburden
Analyze economic impact of natural variation in GPCRs and ineffective drug response on the NHS
Documentation:
<http://docs.gpcrdb.org/nhs.html#nhs-sales>
<http://docs.gpcrdb.org/nhs.html#estimated-economic-burden>
- Human G protein Resource: <https://www.mrc-lmb.cam.ac.uk/CGN/>
Analyze the sequences and structures of human G proteins
- Human GPCR-G protein Selectivity Barcode: <https://gpcrdb.org/signprot/>
Analyze the sequences and structures of human GPCR-G protein interaction selectivity
Documentation:
<http://docs.gpcrdb.org/signalproteins.html#signal-protein-page>
<http://docs.gpcrdb.org/signalproteins.html#gpcr-g-protein-coupling>
<http://docs.gpcrdb.org/signalproteins.html#g-protein-alignments>
<http://docs.gpcrdb.org/signalproteins.html#interface-mapping>

17. Outreach, Public Engagement and News on our Research

Public Engagement and Videos

- Blavatnik 3' video of work and achievements: <https://www.youtube.com/watch?v=3YA8tOKGJDs>
- Blavatnik 2' talk about outlook on science: <https://www.facebook.com/blavatnikawards/videos/2018-blavatnik-inaugural-uk-laureate-in-life-sciences-dr-m-madan-babu-of-the-mrc/1005186296302686/>
- Blavatnik Science Symposium 10' talk on scientific work: https://www.nyas.org/ebriefings/2018/the-2018-blavatnik-science-symposium/?tab=computational_biology
- Blavatnik Awards Ceremony - From 4' introducing Madan: <https://www.youtube.com/watch?v=-MkOggR4pwA>
- GPCR Pharmacogenomics 3.5': <https://www.youtube.com/watch?v=f6F5wXN5fGI>
- Francis Crick Public Lecture: <https://www.youtube.com/watch?v=1YcTIboooJc>
- ISCB Innovator award: <https://www.youtube.com/watch?v=VZhNR8PSVXE>
- The Fabric of Life: science, artists and public organized by MRC-CSC and Central St-Martins Arts school, London, UK (2010)
- Public discussion panel member, EU Science Night. Genomics and Us: The Future of Genomic Medicine, Cambridge, UK (2018)
- Public panel discussion moderator: [The future of research in the UK](#), Science Museum, London, UK (2019)

Interviews

- EMBO: <https://www.embo.org/news/articles/2019/a-computational-approach-to-biological-questions>
- Cambridge Independent: <https://www.cambridgeindependent.co.uk/business/dr-m-madan-babu-of-mrc-lmb-wins-prize-for-insights-into-the-machinery-inside-our-cells-9052911/>
- EMBO Molecular Systems Biology: <https://www.embo.org/news/press-releases/2019/molecular-systems-biology-appoints-m-madan-babu-as-new-chief-editor>
- Protein Society: <https://www2.mrc-lmb.cam.ac.uk/madan-babu-awarded-the-protein-societys-2014-protein-science-young-investigator-award/>
- ISCB innovator award: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5991638/>
- Interview with MSB: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6894041/>
- Interview with Cell: [https://www.cell.com/cell/fulltext/S0092-8674\(16\)31061-3](https://www.cell.com/cell/fulltext/S0092-8674(16)31061-3)

Biosketches/Profiles

- <https://www.embo.org/news/press-releases/2019/m-madan-babu-and-paola-picotti-honoured-with-embo-gold-medal>
- <http://blavatnikawards.org/honorees/profile/madan-babu/>
- https://en.wikipedia.org/wiki/M._Madan_Babu
- <https://www.stjude.org/directory/b/madan-babu.html>
- <https://www.lister-institute.org.uk/fellow-profile-m-madan-babu/>
- <https://www.lister-institute.org.uk/the-protein-contacts-atlas-by-lister-fellow-madan-babu/>
- <https://hstalks.com/playlist/1049/gpcr-signalling-in-human-health-and-disease/>

Write-up on National and International Prizes and Awards

- <https://www2.mrc-lmb.cam.ac.uk/m-madan-babu-elected-fellow-of-the-academy-of-medical-sciences/>
- <https://www.stjude.org/media-resources/news-releases/2021-medicine-science-news/m-madan-babu-elected-to-uk-academy-of-medical-sciences.html>
- <https://www2.mrc-lmb.cam.ac.uk/m-madan-babu-awarded-the-embo-gold-medal/>
- <https://www2.mrc-lmb.cam.ac.uk/computational-biologist-m-madan-babu-is-named-life-sciences-laureate-at-the-2018-blavatnik-awards-for-young-scientists/>
- <https://www2.mrc-lmb.cam.ac.uk/m-madan-babu-winner-2018-iscb-innovator-award/>
- <https://www2.mrc-lmb.cam.ac.uk/madan-babu-john-briggs-honoured-blavatnik-awards/>
- <https://www2.mrc-lmb.cam.ac.uk/three-lmb-scientists-elected-embo-membership-2/>
- <https://www2.mrc-lmb.cam.ac.uk/m-madan-babu-deliver-royal-societys-2016-francis-crick-lecture/>
- <https://www2.mrc-lmb.cam.ac.uk/madan-babu-mohan-awarded-the-royal-society-francis-crick-medal-and-lecture-2016/>
- <https://www2.mrc-lmb.cam.ac.uk/madan-babu-give-colworth-medal-lecture-1st-december/>
- <https://www2.mrc-lmb.cam.ac.uk/melina-schuh-and-m-madan-babu-awarded-lister-research-prizes/>
- <https://www2.mrc-lmb.cam.ac.uk/madan-babu-awarded-the-protein-societys-2014-protein-science-young-investigator-award/>
- <https://www2.mrc-lmb.cam.ac.uk/madan-babu-awarded-prize-lectures/>
- <https://www2.mrc-lmb.cam.ac.uk/lmb-scientists-honoured-by-the-uks-biochemical-society/>
- <https://www2.mrc-lmb.cam.ac.uk/embo-young-investigator-award-for-madan-babu/>
- <https://www2.mrc-lmb.cam.ac.uk/achievements/lmb-student-prize/>

Write-up on Science/specific scientific publications

- <https://www.stjude.org/research/news-publications/research-highlights/2020-research-highlights/why-do-many-drugs-work-in-the-lab-but-fail-to-get-to-the-clinic.html>
- <https://www2.mrc-lmb.cam.ac.uk/a-new-layer-of-complexity-in-gpcr-signalling-could-explain-differences-in-receptor-function-and-drug-response/>
- <https://www2.mrc-lmb.cam.ac.uk/next-generation-sequencing-and-machine-learning-provide-insights-into-the-dark-proteome/>
- <https://www2.mrc-lmb.cam.ac.uk/how-cells-selectively-enhance-gene-expression-in-response-to-stress/>
- <https://www2.mrc-lmb.cam.ac.uk/amino-acid-homorepeats-influence-function-evolution-proteins/>
- <https://www2.mrc-lmb.cam.ac.uk/key-gpcr-g-protein-selectivity/>
- <https://www2.mrc-lmb.cam.ac.uk/molecular-principles-gene-fusion-mediated-protein-interaction-networks-cancer/>
- <https://www2.mrc-lmb.cam.ac.uk/understanding-noise-the-molecular-determinants-of-random-variation-in-gene-expression-levels/>
- <https://www2.mrc-lmb.cam.ac.uk/revealing-how-gpcrs-activate-g-proteins/>
- <https://www2.mrc-lmb.cam.ac.uk/mrna-on-the-move-localisation-can-affect-cell-signalling-and-regulation/>
- <https://www2.mrc-lmb.cam.ac.uk/uncovering-molecular-signatures-of-g-protein-coupled-receptors/>
- <https://www2.mrc-lmb.cam.ac.uk/research-shows-the-power-of-exploiting-publicly-available-data-to-reveal-new-principles-in-biology/>
- <https://www.sciencedaily.com/releases/2013/02/130214075531.htm>
- <https://www2.mrc-lmb.cam.ac.uk/new-insight-on-general-mechanism-behind-gene-expression/>
- Nature briefs: <https://www.nature.com/articles/d41586-017-08709-0>
- American Society of Microbiology: Environment Shapes Bacterial Expression Patterns (*JMB* 2006)
- Pharmacogenomics in *Science Translation Medicine* (2018), *Nature* (2018) and *Cell* video abstract (2018)
- Perspectives (e.g. *Science* 2008), News & Views (e.g. *MSB* 2018), Focus (e.g. *Sci Signaling* 2018)
- F1000 (e.g. *Nature*, 2004,2013,2015; *Science*, 2005,2008; *NAR*, 2007; *Mol Cell* 2012; *Gen Res*, 2009; *NSMB* 2018a,b)
- Highlights: *Nat Methods* (*NSMB* 2018); *Nat Rev Microbiol* (*JMB* 2006); *Nat Rev Drug Discovery* (*Cell* 2018)
- Highlights: *Nat Rev Genet* (*Mol Cell* 2012; *Nature* 2004; *MSB* 2009; *PNAS* 2010), *Sci Signaling* (*Cell* 2018)