

# Amit Dutt, Ph.D.

Professor, Dept of Genetics, University of Delhi South Campus, [amitdutt@south.du.ac.in](mailto:amitdutt@south.du.ac.in)  
[https://www.actrec.gov.in/pi-webpages/AmitDutt/dutt\\_index.html](https://www.actrec.gov.in/pi-webpages/AmitDutt/dutt_index.html) and <https://actrec.gov.in/dr-amit-dutt>

## ACADEMIC QUALIFICATION

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|---------------------------------------------------------------------------------------------------|-----------|
| Ph.D in Developmental Biology, University of Zürich, Switzerland                                  | 2000-2004 |
| Ph.D in Chloroplast Biology, ICGEB (Int Center for Genetic Engg & Biotech) / Jamia Millia Islamia | 1998-2000 |

## PROFESSIONAL EXPERIENCE/ EMPLOYMENT

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|-------------------------------------------------------------------------------------------|---------------|
| Professor, Department of Genetics, University of Delhi South Campus, New Delhi            | 02/2024- ...  |
| Principal Investigator, Scientific Officer “G”, ACTREC, Tata Memorial Center, Navi Mumbai | 2010- 02/2024 |
| Post-Doctoral Research Fellow, Broad Institute of MIT & Harvard (Cancer Genomics)         | 2005-2010     |
| Post-Doctoral Research Fellow, Univ Hosp of Zurich, Switzerland (Prion Biology)           | 2004-2005     |

## HONORS & AWARDS

- Shanti Swarup Bhatnagar Prize for Science and Technology in Medical Sciences
- Tata Innovation Fellowship Award, Dept of Biotechnology, Govt of India
- Featured among top 75 scientists of India, across all disciplines, shaping the future of the country by DST
- YIM Boston Young Scientist Award 2018
- Distinguished Alumni Award, conferred by the Vice Chancellor, Jamia Millia Islamia,
- Wellcome Trust/ DBT India Alliance Intermediate Fellowship
- Ramalingaswami Fellowship Award, Department of Biotechnology, Govt of India
- Swiss National Science Foundation Postdoctoral fellowship Award, Switzerland
- Julius Klaus Foundation Fellowship Award, University of Zürich, Switzerland.

## PATENTS

**Title:** Novel fusion transcripts, composition and use thereof in treating cancer

**Applicant:** ACTREC- Tata Memorial Centre

**Inventors:** **Amit Dutt**, Bhasker Dharavath, Pawan Upadhyay, and Sudhir Nair

**Patent Application:** 202321054451 **Ref. No.:** E- 8000 1/63425/2023-MUM; **C.B.R. No.:** 320

## RESEARCH GRANTS

|                  |                                                                                                                                                                        |                                            |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| <b>2011-2012</b> | Profiling the incidence of novel alteration discovered in human lung cancer                                                                                            | Seed-In-Air grant, Tata Memorial Center    |
| <b>2012-2015</b> | Epidemiological study to evaluate the prevalence of epidermal growth factor receptor(EGFR mutation status in non-small cell lung cancer(NSCLC) in india.               | Roche sponsored                            |
| <b>2012-2015</b> | Profiling the incidence of novel alteration discovered in human lung cancer                                                                                            | Terry Fox Foundation                       |
| <b>2013-2017</b> | Whole genome sequencing for identification of oncogenic mutations in cervical adenocarcinoma.                                                                          | Terry Fox Foundation                       |
| <b>2012-2017</b> | Progesteronics of human breast cancer: a translational approach                                                                                                        | Tata Memorial Center                       |
| <b>2012-2017</b> | Genome-wide RNAi screen with human pooled tyrosine kinase shRNA libraries in head and neck squamous cell carcinoma (HNSCC) cell lines                                  | DBT- RNAi taskforce                        |
| <b>2012-2018</b> | Defining the cancer genome of head and neck squamous cell carcinoma (HNSCC) with snp arrays and next generation sequencing technology”                                 | Wellcome Trust/ DBT India Alliance         |
| <b>2018-2021</b> | Understanding the mechanistic of resistance to tyrosine kinase inhibitors in non-small cell lung cancer patients.                                                      | SERB, Dept of Science and Technology       |
| <b>2017-2022</b> | Multi-Omics analysis to decipher mechanisms of hormone resistance and development of novel assays and therapeutic targets in endocrine receptor positive breast cancer | Dept of Biotechnology (DBT)/ VNCI          |
| <b>2020-2023</b> | Deep learning approach for predicting nodal metastasis in tongue cancer using integrative genotype and radiological and pathological phenotype                         | DBT (approved, sanction awaited)           |
| <b>2023-2026</b> | Characterizing the Mechanistic Insights and Clinical Relevance of Fusobacterium in Tongue Cancer                                                                       | SERB, Dept of Science and Technology       |
| <b>2024-2029</b> | To establish Shodhvik oncology liquid biopsy hotspot assay platform                                                                                                    | ICMR, Centre for Adv Research (in process) |

**2024**

- 91: Elucidating the efficacy and pharmacokinetics of once-weekly Osimertinib in *EGFR*- mutant lung cancer. *Nanosclae* (under review)
- 90: Trivedi V, Noronha V, Bal M, Chandrani P, Poojary D, Saldanha E, ....., Prabhash K, **Dutt A**. THRA mutations as promoters of cellular plasticity in Anaplastic thyroid cancer. (under review)
- 89: Behel V, Noronha V, Hait S.... Desai S, Prabhash K, **Dutt A**. Dismal clinical utility of NGS-based microbial analysis of cell-free DNA in lung cancer. (under review)
- 88: Desai S, Ahmad S, Bawaskar B, Rashmi S, Mishra R, Lakhwani D, **Dutt A**. Singleton Mutations in Large Scale Cancer Genome Studies: Uncovering the Tail of Cancer Genome. *NAR Cancer*. 2024 Mar 12;6(1):zcae010. **IF 5.1**
- 87: Chandrani P, Saldanha E, Patil V, Bal M, Reddy SP, Sanjeev A...Chaturvedi P, **Dutt A**, Prabhash K. *RET* alterations differentiate molecular profile of medullary thyroid cancer. *JCO Precis Oncol*. 2024 May;8:e2300622:
- 86: Dharavath B, Butle A, Pal A, Desai S, Thorat R, Upadhyay P, Nair S, **Dutt A**. *UBEC3-LRP5* Fusion is a Novel Oncogenic Driver in Head and Neck Cancer. *NPJ Precis Oncol*. 2024 Mar 4;8(1):63. **IF 10.1**
- 85: Chaubal R, Gardi NL, Joshi S, Pantvaitya G, Kadam R, Vanmali V, Hawaldar R, Talker E, Chitra J, Gera P, Bhatia D, Kalkar P, Gurav M, Shetty O, Desai S, Krishnan NM, Nair N, Parmar V, **Dutt A**, Panda B, Gupta S, Badwe RA. Surgical resection of tumors in cancer patients deregulates Hallmarks of Cancer in resected tissue and surrounding microenvironment. *Mol Cancer Res*. 2024 Feb 23. **IF 5.2**
- 84: Rekhi B, Dave V, Butle A, Dharavath B, Khetale S, Redhu AK, Singh R, **Dutt A**. Immunohistochemical expression of H3.3 G34W in 100 giant cell tumors of bone and its diagnostic mimics, including its value in resolving uncommon diagnostic scenarios: A single institutional study at a tertiary cancer referral center, India. *Indian J Pathol Microbiol*. 2024 Feb 12.
- 83: Gaur T, Ali A, Sharma D, Gupta SK, Gota V, Bagal B, Platzbecker U, Mishra R, Dutt A, Khattry N, Mills K, Hassan MI, Sandur S, Hasan SK. Share. Mitocurcumin utilizes oxidative stress to upregulate JNK/p38 signaling and overcomes Cytarabine resistance in acute myeloid leukemia. *Cell Signal*. 2024 Feb;114:111004. **IF 4.3**

**2023**

- 82: Redhu A, Butle A, Rajpurkar S,.....Gota V, **Dutt A**. Trivedi V, Noronha V,..Prabhash K, **Dutt A**. Association of *Cutibacterium* acne with human thyroid cancer. *Frontiers in Endocrinology (In Press)*. **IF 6.1**
- 81: Chougule A, Chandrani P, Noronha V, Pange P, Kale S, Nikam A, Nambiar K, Marchande D, Durve A, Gupta V, Jagtap V, Tiwrekar P, Menon N, Joshi A, Kaushal R, Pai T, Patil VM, **Dutt A**, Banavali SD, Prabhash K. Real world evidence of EGFR targeted therapy in non-small cell lung cancer– a brief report of decade long single centre experience. *JTO Clin Res Rep*. 2023 Aug 23;4(11):100566
- 80: Gaur T, Poddutoori R, Khare L, Bagal B, Rashmi S, Patkar N, Tembhare P, Subramanian PG, Shetty D, **Dutt A**, et al. Novel Covalent CDK7 Inhibitor Potently Induces Apoptosis in Acute Myeloid Leukemia and Synergizes with Venetoclax. *Journal of Experimental & Clinical Cancer Research*. 2023 Jul 29;42(1):186. **IF 11.3**
- 79: Chakravorty G, Ahmad S, Godbole MS, Gupta S, Badwe RA, **Dutt A**. Deciphering the mechanisms of action progesterone in breast cancer. *Oncotarget*. 2023 Jul 1;14:660-667. **IF 5.1**
- 78: Rekhi B, Dave V, Butle A, **Dutt A**. Utility of immunohistochemical expression of H3.3K36M and DOG1 in the diagnosis of chondroblastomas: An experience from a tertiary cancer referral center. *Ann Diagn Pathol*. 2023 Jun 21;66:152174
- 77: Butti R, Kapse P, Bhadauriya G, Ahmad S, Chaubal R, Parab P, Kadam R, Mahapatra SS, Shet T, **Dutt A**, Gupta S, Kundu GC. Development and characterization of patient-derived orthotopic xenograft of therapy-resistant breast cancer. *Oncol Rep*. 2023 May;49(5). pii: 99. **IF 3.9**
- 76: Dharavath B, Butle A, Pal A, Desai S, Upadhyay P, Rane A, Khandelwal R, Manavalan S, Thorat R, Sonawane K, Vaish R, Gera P, Bal M, D’Cruz AK, Nair S, **Dutt A**. miR-944/MMP10/AXL- axis Predict Lymph Node Metastasis in Early Stage Tongue Cancer. *Commun Biol*. 2023 Jan 17;6(1):57. [[The Indian Express](#)][[Nature Cancer Community](#)] **IF 6.6**

**2022**

- 75: Yadav N, Sunder R, Desai S, Dharavath B, Chandrani P, Godbole M, **Dutt A**. Progesterone modulates the DSCAM-AS1/miR-130a/ESR1 axis to suppress cell invasion and migration in breast cancer. *Breast Cancer Res*. 2022 Dec 28;24(1):97 [[The Hindu](#)] **IF 8.4**
- 74: Noronha V, Chougule A, Chandrani P, Kaushal RK, Patil VM, Menon N, Kapoor A, Chopade S, Singh A, Shetty O, **Dutt A**, Banavali S, Prabhash K. Lung cancer with dual *EGFR* and *ALK* driver alterations at baseline: a retrospective observational cohort study. *Acta Oncol*. 2022 Aug 16:1-5. **IF 4.3**
- 73: Rekhi B, Dodd L, Dharavath B, **Dutt A**. Cytomorphology of spindle cell/sclerosing rhabdomyosarcoma, including MYOD1 (LI22R) mutation result. *Diagn Cytopatho*. 2022

- 72: Behel V, Noronha V, Choughule A, Shetty O, Chandrani P, Kapoor A, Bondili SK, Bajpai J, Kumar R, Pai T, Bal M, Gurav M, Bapat P, Mittal N, Menon S, Patil V, Menon N, **Dutt A**, Prabhash K. Impact of Molecular Tumor Board on the Clinical Management of Patients With Cancer. *JCO Glob Oncol*. 2022 Jul;8 **IF 4.5**
- 71: Joshi A, Butle A, Hait S, Mishra R, Trivedi V, Thorat R, Choughule A, Noronha V, Prabhash K, **Dutt A**. Osimertinib for Lung Cancer Cells Harboring Low-Frequency *EGFR T790M* Mutation. *Transl Oncol* 2022. [[The Indian Express](#)] **IF 5.0**
- 70: Desai S, Mishra R, Ahmad S, Hait S, Joshi A, **Dutt A**. TMC-SNPdb 2.0: an ethnic specific database of Indian germline variants. *Database (Oxford)* 2022. [[India Science Wire-Vigran Prasar](#)] **IF 5.8**
- 69: Desai S, Dharavath B, Manavalan S, Rane A, Redhu AK, Sunder R, Butle A, Joshi A, Togar T, Apte S, Bala P, Chandrani P, Bashyam MD, Banerjee A, Prabhash K, Nair S, **Dutt A**. *Fusobacterium nucleatum* is associated with inflammation and poor survival in early-stage HPV-negative tongue cancer. *NAR Cancer* 2022 [[The Hindu](#)] **IF 5.1**
- 68: Butle A, Joshi A, Noronha V, Prabhash K, **Dutt A**. Weekly osimertinib dosing prevents EGFR mutant tumor cells destined to home mouse lungs. *Transl Oncol*. 202 May 13;14(8):101111. **IF 4.2** [[Research Matters](#)]
- 67: Desai S, Rane A, Joshi, A, **Dutt A**. IPD 2.0: To derive insights from an evolving SARS-CoV-2 genome. *BMC Bioinformatics*. 2021 May 13;22(1):247 **IF 3.2** [[nature India](#)] [[India Bioscience](#)][[The Hindu](#)][[Indian Express](#)][[Business Standard](#)][[Fortune](#)][[The Print](#)][[The Federal](#)]
- 66: Joshi A, Mishra R, Desai S, Chandrani P, Kore H, Sunder R, Hait S, Iyer P, Trivedi V, Choughule A, Noronha V, Joshi A, Patil V, Menon N, Kumar R, Prabhash K, **Dutt A**. Molecular Characterization of Lung Squamous Cell Carcinoma Patients of Indian Descent Reveal Therapeutically Relevant Alterations. *Oncotarget*. **IF 5.1** [[News Med Lif Sci](#)][[Mirage News](#)][[Bioengineer.org](#)][[ScienMag](#)] [[EurAlert](#)]
- 65: Desai S, Rashmi S, Rane A, Dharavath, B, Sawant A, **Dutt A**. An integrated approach to determine the abundance, mutation rate and phylogeny of the SARS-CoV-2 genome. *Briefings in Bioinformatics*, 2020 (*In Press*). **IF: 11.6, Citation: 17** [[nature India](#)][[IndiaBioscience](#)][[The Hindu](#)][[Indian Express](#)][[Business Standard](#)][[Fortune](#)][[The Print](#)][[The Federal](#)]
- 2020**
- 64: Salunkhe S, Mishra SV, Ghorai A, Hole A, Chandrani P, **Dutt A**, Chilakapati M, Dutt S. Metabolic rewiring in drug resistant cells exhibit higher OXPHOS and fatty acids as preferred major source to cellular energetics. *Biochim Biophys Acta Bioenerg*. 2020 Aug 25;1861(12):148300. doi: 10.1016/j.bbabi.2020. **IF: 4.5, Citation: 25**
- 63: Dharavath B, Yadav N, Desai S, Sunder R, Mishra R, Ketkar M, Bhanshe P, Gupta A, Redhu AK, Patkar N, Dutt S, Gupta S, **Dutt A**. A one-step, one-tube real-time RT-PCR based assay with an automated analysis for detection of SARS-CoV-2. *Heliyon*. 2020 Jul 7;6(7):e04405. **Citation: 30** [[Sci Soup](#)] [[The Hawk](#)] [[Biotech Times](#)] [[India Today](#)] [[Research Stash](#)]
- 62: Desai S, Vatsa Mishra S, Joshi A, Sarkar D, Hole A, Mishra R, Dutt S, Chilakapati MK, Gupta S, **Dutt A**. Raman Spectroscopy Based Detection of RNA viruses in Saliva: a preliminary report. *J Biophotonics*. 2020 Jul. **IF: 3.8, Citation: 50** [[The Hindu](#)][[India Today](#)][[JMI](#)] [[Clinical Omics](#)] [[WITech](#)] [[Dhyeya IAS](#)]
- 61: Kaur E, Nair J, Ghorai A, Mishra SV, Achareker A, Ketkar M, Sarkar D, Salunkhe S, Rajendra J, Gardi N, Desai S, Iyer P, Thorat R, **Dutt A**, Moiyadi A, Dutt S. Inhibition of SETMAR-H3K36me2-NHEJ repair axis in residual disease cells prevent glioblastoma recurrence. *Neuro Oncol*. 2020 May 27. **IF: 12.3**
- 60: Togar T, Desai S, Mishra R, Terwadkar P, Ramteke M, Ranjan M, Kawle D, Sahoo B, Pal A, Upadhyay P, **Dutt A**. Identifying cancer driver genes from functional genomics screens. *Swiss Med Wkly*. 2020 Feb 21;150:w20195.
- 2019**
- 59: Sikder S, Kumari S, Kumar M, Sen S, Singhal N, Chellappan S, Godbole M, Chandrani P, **Dutt A**, Gopinath K, Kundu T. Multifunctional human chromatin protein PC4 is downregulated in Breast Cancer to promote disease progression: Implications of miR-29a. *Oncotarget* (2019) **IF: 5.0**
- 58: Arora R, Rekhi B, Chandrani P, Krishna S, **Dutt A**. Merkel cell polyomavirus is implicated in a subset of Merkel cell carcinomas, in the Indian subcontinent. *Microbial Pathogenesis*. 2019 **IF: 3.7** [[Med Xpress](#)]
- 57: Noronha V, Patil VM, Joshi A, ..., **Dutt A**, Banavali SD, Prabhash K. Gefitinib vs gefitinib with pemetrexed-carboplatin chemotherapy in EGFR mutated lung cancer (gef vs gef+C). *Journal of Clinical Oncology*. (2019) **IF: 44.54; Citation: 306**
- 56: Singh S, Kumar M, Kumar S, Sen S, Upadhyay P, Bhattacharjee P, Naveen M, Tomar SV, Roy S, **Dutt A**, Kundu TK. The cancer-associated, gain-of-function TP53 variant P152Lp53 activates multiple signaling pathways implicated in tumorigenesis. *J Biol Chem* (2019) **IF: 5.2**
- 55: Pahuja KB, Nguyen TT, ...**Dutt A** et al. Actionable Activating Oncogenic ERBB2/HER2 Transmembrane and Juxtamembrane Domain Mutations. *Cancer Cell*. 2018 Nov 12;34(5):792-806 **IF: 31.7; Citation: 104**

54: Iyer P, Shrikhande SV, Ranjan M, Joshi A, Gardi N, Prasad R, Dharavath B, Thorat R, Salunkhe S, Sahoo B, Chandrani P, Kore H, Mohanty B, Chaudhari V, Choughule A, Kawle D, Chaudhari P, Ingle A, Banavali S, Gera P, Ramadwar MR, Prabhash K, Barreto SG, Dutt S, **Dutt A**. *ERBB2* and *KRAS* Alterations Mediate Response to EGFR Inhibitors in Early Stage Gallbladder Cancer. *International Journal of Cancer*. 2019 **IF: 7.4; Citation: 38**[\[natureINDIA\]](#)[\[wellcomedbt\]](#)[\[TheHindu\]](#)[\[India Bioscience\]](#)

2018

53: Godbole M, Togar T, Patel K, Dharavath B, Yadav N, Janjuha S, Gardi N, Tiwary K, Terwadkar P, Desai S, Prasad R, Dhamne H, Karve K, Salunkhe S, Kawle D, Chandrani P, Dutt S, Gupta S, Badwe RA, **Dutt A\***. Up-regulation of the kinase gene *SGK1* by progesterone activates the AP-1—NDRG1 axis in both PR-positive and -negative breast cancer cell. *J Bio Chem*. 2018. **IF: 5.2; Citation: 26**

52: Salunkhe S, Chandran N, Chandrani P, **Dutt A**, Dutt S. CytoPred: 7 gene pair metrics for AML cytogenetic risk prediction. *Briefings in Bioinformatics*. 2018; (*In press*) **IF: 11.6; Citations:5**

51: Balaji SA, Shanmugam A, Chougule A, Sridharan S, Prabhash K, Arya A, Chaubey A, Hariharan A, Kolekar P, Sen M, Ravichandran A, Katragadda S, Sankaran S, Bhargava S, Kulkarni P, Rao S, Sunkavalli C, Banavali S, Joshi A, Noronha V, **Dutt A**, Bahadur U, Hariharan R, Veeramachaneni V, Gupta V. Analysis of solid tumor mutation profiles in liquid biopsy. *Cancer Med*. 2018 Sep 27. doi: 10.1002/cam4.1791. **IF: 4.5; Citation: 18**

50: Barreto SG, **Dutt A**, Sirohi B, Shrikhande SV. Gallbladder cancer: a journey of a thousand steps. *Future Oncol*. 2018 Jun;14(13):1299-1306. doi: 10.2217/fon-2017-0576. **IF: 3.4**

49: Veldore VH, Choughule A, Routhu T, Mandloi N, Noronha V, Joshi A, **Dutt A**, Gupta R, Vedam R, Prabhash K. Validation of liquid biopsy: plasma cell-free DNA testing in clinical management of advanced non-small cell lung cancer. *Lung Cancer (Auckl)*. 2018 Jan 3;9:1-11 **IF: 5.7; Citation: 58**

48: Chatterjee S, Chaubal R, Maitra A, Gardi N, **Dutt A**, Gupta S, Badwe RA, Majumder PP, Pandey P. Pre-operative progesterone benefits operable breast cancer patients by modulating surgical stress. *Breast cancer research and treatment*. 2018;170(2):431-438 **IF:4.9;Citation: 10**

47: Rajendra J, Datta KK, Ud Din Farooq SB, Thorat R, Kumar K, Gardi N, Kaur E, Nair J, Salunkhe S, Patkar K, Desai S, Goda JS, Moiyadi A, **Dutt A**, Venkatraman P, Gowda H, Dutt S. Enhanced proteasomal activity is essential for long term survival and recurrence of innately resistant residual glioblastoma cells *Oncotarget*. 2018; 9(45):27667-27681. **IF: 5.0; Citation: 12**

2017

46: Godbole M, Chandrani P, Gardi N, Dhamne H, Patel K, Yadav N, Gupta S, Badwe R, **Dutt A\***. *miR-129-2* mediates down-regulation of progesterone receptor in response to progesterone in breast cancer cells. *Cancer Biology & Therapy*. 2017 **IF: 4.7; Citation: 21** [\[The Hindu\]](#)

45: Godbole M, Sharma K, Badwe R, Gupta S, **Dutt A\***. Progesterone suppresses the invasion and migration of breast cancer cells irrespective of their progesterone receptor status. *Cellular Oncology* 2017; 40(4):411-417. **IF: 6.7; Citation: 21** [\[wellcomedbt\]](#) [\[The Hindu\]](#)

44: Upadhyay P, Gardi N, Desai S, Chandrani P, Joshi A, Dharavath B, Arora P, Bal M, Nair S, **Dutt A\***. Genomic characterization of tobacco/nut chewing HPV-negative early stage tongue tumors identify MMP10 as a candidate to predict metastases. *Oral Oncology* 73 (2017) 56–64 **IF: 5.3; Citation: 38** [\[natureINDIA\]](#) [\[IndiaBioscience\]](#) [\[wellcomedbt\]](#) [\[The Hindu\]](#)[\[Atlas of Science\]](#)[\[The Hawk\]](#)

43: Noronha V, Chougule A, Patil VM, Joshi A, Kumar V, Philip DSJ, Banavasi S, **Dutt A**, Prabhash K. Epidermal growth factor receptor exon 20 mutation in lung cancer: types, incidence, clinical features and impact on treatment. *OncoTargets and Therapy*. 2017; 10:2903-2908 **IF: 4.1; Citation: 39**

42: Bhat S, Gardi N, Hake S, Kotian N, Sawant S, Kannan S, Parmar V, Desai S, **Dutt A**, Joshi NN. Impact of intra-tumoral IL17A and IL32 gene expression on T-cell responses and lymph node status in breast cancer patients. *Journal of Cancer Research and Clinical Oncology*. 2017; 143(9):1745-1756. **IF: 4.55; CI: 16**

41: Mitra I, Samant U, Sharma S, Raghuram GV, Saha T, Tidke P, Pancholi N, Gupta D, Prasanna P, Gaikwad A, Gardi N, Chaubal R, Upadhyay P, Pal K, Rane B, Shaikh A, Salunkhe S, Dutt S, Mishra PK, Khare NK, Nair NK, **Dutt A** (2017). Cell-free chromatin from dying cancer cells integrate into genomes of bystander healthy cells to induce DNA damage and inflammation. *Cell Death Discovery* 3, 17015; 2017 **IF: 5.2; Citation: 93** [\[IndiaBioscience\]](#)

2016

40: Chandrani P, Prabhash K, Choughule A, Prasad R, Sethunath V, Ranjan M, Iyer P, Aich J, Dhamne H, Iyer DN, Upadhyay P, Mohanty B, Chandna P, Kumar R, Joshi A, Noronha V, Patil V, Ramaswamy A, Karpe A, Thorat R, Chaudhari P, Ingle A, **Dutt A\***. Drug-sensitive *FGFR3* mutations in lung adenocarcinoma. *Annals of oncology: official journal of the European Society for Medical Oncology*. 2016 **IF: 33; Citation: 38** [\[natureINDIA\]](#) [\[India Bioscience\]](#) [\[wellcomedbt\]](#) [\[Indian Express\]](#)

39. Rekhi R, Upadhyay P, Ramteke M, and **Dutt A\***. *MYOD1* (L122R) Mutations Are Associated with Spindle cell / Sclerosing Rhabdomyosarcomas with Aggressive Clinical Outcomes. *Mod Pathology* 2016. **IF: 7.8; Citation: 91**
38. Barreto SG and **Dutt A\***. To improve outcomes of gallbladder cancer we need to better understand it! *Hepatobiliary Surg Nutr* 2016;5(4):379-381. doi: 10.21037/hbsn.2016.05.06
37. Kaur E, Sahu A, Hole AR, Rajendra J, Chaubal R, Gardi N, **Dutt A.**, Moiyadi A, Krishna CM, Dutt S. Unique spectral markers discern recurrent Glioblastoma cells from heterogeneous parent population. *Sci Rep.* 2016 May 25;6:26538 **IF: 4.4; Citation: 16**
36. Upadhyay P, Gardi N, Desai S, Sahoo B, Singh A, Togar T, Iyer P, Prasad R, Chandrani P, Gupta S, **Dutt A\***. TMC-SNPdb: an Indian germline variant dataset derived from whole exome sequence. *Database*, 2016, 1–8. **IF: 4.0, Citation: 12** [[TMC-SNPdb](#)] [[Wellcomedbt](#)]
35. Upadhyay P, Nair S, Kaur E, Aich J, Dani P, Sethunath V, Gardi N, Chandrani P, Godbole M, Sonawane K, Prasad R, Kannan S, Agarwal A, Kane S, Gupta S, Dutt S, **Dutt A\***. Notch pathway activation is essential for maintenance of stem-like cells in early tongue cancer. *Oncotarget* 2016 **IF:5.0; Citation: 40** [[Wellcomedbt](#)]
34. Iyer P, Barreto SG, Sahoo B, Chandrani P, Ramadwar MR, Shrikhande SV, **Dutt A\*** Non-typhoidal Salmonella DNA traces in gallbladder cancer. *Infect Agent Cancer.* 2016 Mar 3;11:12. **IF: 3; Citation: 51** [[IndiaBioscience](#)] [[Wellcomedbt](#)]

#### 2015

33. Chandrani P, Upadhyay P, Iyer P, Tanna M, Shetty M, Raghuram GV, Oak N, Singh A, Chaubal R, Ramteke M, Gupta S, **Dutt A\***. Integrated Genomics Approach to Identify Driver Alteration. *BMC Genomics.* 2015 Nov 14;16(1):936. doi: 10.1186/s12864-015-2138-4. **IF: 4.0; Citation: 9**
32. Ramteke MP, Patel KJ, Godbole M; Vyas M, Karve K, Choughule A, Prabhash K, **Dutt A\***. CRE: a cost effective and rapid approach for PCR-mediated concat of *KRAS* and *EGFR* exons *f1000Research* 06/2015; 4(160).
31. Barreto SG, Barreto M, Chaubal R, **Dutt A** The fight against cancer: Is it worthwhile? *Indian J Med Paediatr Oncol.* 2015 Apr-Jun;36(2):85-6. doi:10.4103/0971-5851.158833.
30. Chandrani P, Kulkarni V, Iyer P, Randeep Singh, **Dutt A\***. NGS Based Approach to Determine the Presence of HPV and Their Sites of Integration in Human Cancer Genome. *Br J of Cancer.* 2015 May 14. **IF: 7.6; Citation: 66** [[HPVDetector](#)] [[Wellcomedbt](#)]
29. Mitra I, Khare NK.... **Dutt A.** Circulating nucleic acids damage DNA of healthy cells by integrating into their genome and induce oncogenic transformation. *J Biosci.* 2015 Mar;40(1):91-111. **IF: 1.8; Citation: 93**

#### 2014

28. Choughule A, Sharma R, Trivedi V, .. Aich J, Prabhash K, **Dutt A\***. Coexistence of *KRAS* mutation with mutant but not wild type *EGFR* predict response to tyrosine-kinase inhibitors in human lung cancer. *British J of Cancer,* 12 August 2014. **IF: 7.6; Citation: 40**
27. Upadhyay P, Dwivedi R, **Dutt A\*** Application of NGS in Cancer Research. *Current Sc*, 2014; 107 (5), 795
26. Barreto SG, **Dutt A\***, Adarsh Chaudhary. A Genetic Model for Gallbladder Carcinogenesis and its Dissemination. *Annals of Oncology* 2014 **IF: 33; Citation: 71** [[A commentary on this article](#)]

#### 2013

25. Chougule A, Prabhash K, Noronha V, Joshi A, Thavamani A, Chandrani P, Upadhyay P, Utture S, Desai S, Jambhekar N, **Dutt A\***. Frequency of *EGFR* Mutations in 907 lung adenocarcinoma Patients of Indian Ethnicity. *PLoS One.* 2013 Oct 4;8(10):e76164. **IF 3.2; Citation: 107**
24. Chougule A, Prabhash K, Noronha V, Joshi A, Thavamani A, Chandrani P, Upadhyay P, Utture S, Desai S, Jambhekar N, **Dutt A\***. *EGFR* Mutation Subtypes and Geographical Distribution Among Indian NSCLC Patients. *Indian J Cancer.* 2013 Apr-Jun;50(2):107. **IF: 1.2; Citation: 37**
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#### 2011

20. Cho J, ..**Dutt A**, et al. Glioblastoma-derived *EGFR* carboxyl-terminal deletion mutants are transforming and are sensitive to *EGFR*-directed therapies. *Cancer Res.* 2011 **IF 3.2; Citation: 76**

- 19: **Dutt A\*** et al. Inhibitor-sensitive FGFR1 amplification in human non-small cell lung cancer. *PLoS One*. 2011;6(6):e20351. **IF 3.2; Citation: 438**
- 18: Hammerman P, Sos ML, Ramos AH, Xu C, **Dutt A** et al. Mutations in the DDR2 kinase gene identify a novel therapeutic target in squamous cell lung cancer. *Cancer Discovery* 2011. **IF 3.2; Citation: 568**

#### **2010 and earlier (from Post Doc and Ph.D.)**

- 17: Zhou W, Hur W, McDermott U, **Dutt A** et al. A Structure-guided Approach to Creating Covalent FGFR1 Inhibitors. *Chem Biol*. 2010 Mar 26;17(3):285-95 **IF 5.9; Citation: 199**
- 16: Bass AJ, Watanabe H... **Dutt A** et al. SOX2 Is an Amplified Oncogene in Lung and Esophageal Squamous Cell Carcinoma. *Nat Genet*. 2009 Nov;41(11):1238-42. **IF 27.6; Citation: 1022**
- 15: Ramos AH<sup>s</sup>, **Dutt A**<sup>s</sup> et al. Amplification of chromosomal segment 4q12 in non-small cell lung cancer. *Cancer Biol Ther*. 2009 Nov;8(21):2042-50. <sup>s</sup> co-first authors. **IF 3.7; Citation: 102** [[News and views](#)]
- 14: **Dutt A**, Salvesen H, Greulich H, Sellers WR, Beroukhim R, Meyerson M. Somatic mutations are present in all members of the AKT family in endometrial carcinoma. *Br J of Cancer*; 2009;101(7):1218-9 **IF 5.8; Citation: 38**
- 13: Salvesen HG, Cartel L, Mannelqvist M, **Dutt A** et al., Gene expression profiles identify an aggressive subtype of endometrial carcinoma associated with amplification and of PIK3CA. *PNAS USA*. 2009 **IF 11.2; Citation: 344**
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- 11: **Dutt A**, et al.. Drug-sensitive *FGFR2* mutations in endometrial carcinoma. *Proc Natl Acad Sci U S A*. 2008 Jun 24;105(25):8713-7. **IF 11.2; Citation: 400**
- 10: Thomas RK... **Dutt A** et al. High-throughput oncogene mutation profiling in human cancer. *Nat Genet*. 2007 Mar;39(3):347-51. **IF 27.6; Citation: 1130**
- 9: **Dutt A**, Beroukhim R. Single nucleotide polymorphism array analysis of cancer. *sCurr Opin Oncol*. 2007 Jan;19(1):43-9. Review. **IF 3.4; Citation: 141**
- 8: **Dutt A**, Wong KK. Mouse models of lung cancer. *Clin Cancer Res*. 2006;12(14):4396-4402s. **IF 12.5; Citation: 64**
- 7: Murtaza I... **Dutt A** et al. A study on p53 gene alterations in esophageal squamous cell carcinoma and their correlation to common dietary risk factors among population of the Kashmir valley. *World J Gastroenterol* 2006 Jul 7;12(25):4033-7. **IF 3.7; Citation: 73**
- 6: Murtaza I. **Dutt A**. A preliminary investigation demonstrating the effect of quercetin on the expression of genes related to cell-cycle arrest, apoptosis and xenobiotic metabolism in human CO115 colon-adenocarcinoma cells using DNA microarray. *Biotechnol Appl Biochem*. 2006 Jul;45(Pt 1):29-36. **IF 1.6; Citation: 58**
- 5: Murtaza I, **Dutt A**, Mushtaq D, Ali A. Molecular cloning and genetic analysis of functional merB gene from indian isolates of Escherichia coli. *Curr Microbiol*. 2005 Nov;51(5):297-302. **IF 1.7; Citation: 12**
- 4: **Dutt A**, Canevascini S, Froehli-Hoier E, Hajnal A. EGF signal propagation during C. elegans vulval development mediated by ROM-1 rhomboid. *PLoS Biol*. 2004 Nov;2(11):e334. **IF 7.0; Citation: 80**
- 3: Murtaza I, **Dutt A**, Ali A. Relationship between the persistence of mer operon sequences in Escherichia coli and their resistance to mercury. *Curr Microbiol*. 2002 Mar;44(3):178-83. **IF 1.7; Citation: 24**
- 2: Murtaza I, **Dutt A** and Ali Arif 2002 Biomolecular engineering of organomercurial lyase in *Escherichia coli*. *Indian J. Biotech*. 2002;1:117-120. (ISSN: 0972-5849)
- 1: Murtaza I, **Dutt A** and Ali Arif. 2001 Inducible mercury operons in Broad Spectrum *Escherichia coli* *Ind. J. Microbiol*. 2001; 41:169-172, (ISSN: 0046-899)

#### **PUBLICATIONS (Book Chapters)**

- 1: Asim Joshi, Bhasker Dharavath, Aniket Chowdhary, Rudransh Singh, Sanket Desai, and Amit Dutt. Chapter in Book entitled, "Genetic alterations and microbial dysbiosis underlie lymph node metastasis in tongue cancer", in Handbook of Oncobiology: From Basic to Clinical Sciences, edited by- Rakesh Kumar and RC Sobti, 2023.
- 2: Pratik Chandrani and **Amit Dutt** Domain specific Targeting of Cancer. Chapter XII in Book entitled, "Nuclear Signaling Pathways and Targeting Transcription in Cancer", Springer Science & Business Media, 2013; 299-310 ISBN: 978-1-4614-8039-6.
- 3: Next Generation Sequencing and Cancer Biology, by **Amit Dutt**-- an invited article in "Cutting Edge", May 2012, A Spinco Biotech Publication.

#### **ACADEMIC ACTIVITIES**

*h index*: 36; *Citations*: 9611; *Research Interest Score*: 3,969; <https://orcid.org/0000-0002-1119-4774>

Number of Ph.D students graduated: **Nine**

Number of Ph.D students currently pursuing Ph.D: **Six**

Number of Postdocs trained: **Five**

Number of Postdocs currently pursuing: **Three** (*One core ACTREC PDF; one NPDF; one DBT RA fellow*)

Number of Thesis examiners: **Fifteen**

Number of Doctoral committee members served/ serving: **Fourteen**

## INVITED INTERNATIONAL PRESENTATIONS

### 2023

- Invited speaker and faculty to the Excellence in Oncology Care 2023 at the 8th edition of the UAE Cancer Congress from 6th- 8th October 2023 held at **Dubai, United Arab Emirates.**

### 2022

- Invited speaker and faculty to the Lung Cancer Session at the 8th edition of the UAE Cancer Congress from 21st-22nd October 2022 held at the Inter Continental Hotel Festival City **Dubai, United Arab Emirates.**

### 2019

- Invited guest lecture (as a part of Special Distinguished Lecture Series) on 3 May 2019, at the GSU organized by the Molecular Basis of Disease Area of Focus (MBDAF) at **Georgia State University, Atlanta, USA.**
- Invited speaker at Global Academic Programs Annual Conference- **GAP2019, Houston, 30 Apr -2 May 2019.**
- Invited Speaker from Apr 28-29 at the Dept of Genetics, **MD Anderson Cancer Centre, Houston, USA**

### 2018

- Invited Speaker at the Annual GAP Conference 2018 “Global efforts fighting cancer”, **Karolinska Institutet and Karolinska University Hospital, Stockholm, Sweden**, from May 15-17, 2018.
- Invited Speaker to a Special Seminar by the Institute of **Molecular Life Sciences, University of Zurich, Switzerland** on May 11, 2018

### 2017

- Invited speaker to the International conference (ICGCK 2017) to be held in **Seoul National University, Seoul** on Oct 26-27, 2017
- Invited Speaker to the Researcher Meeting: Genetics and Physiology in Health and Disease by the **Wellcome Trust, held in June 2017, Cambridge, UK**

### 2016

- Invited speaker and faculty to the Lung Cancer Session at the 8th edition of the UAE Cancer Congress from 21st-22nd October 2016 held at the Inter Continental Hotel Festival City **Dubai, United Arab Emirates.**
- Invitation to present at the inaugural Cancer-Disease Ontology workshop organized from Apr 10- 14th in **Geneva, Switzerland**
- Invited speaker to the Helga Salvesen Memorial Symposium at the **Broad Institute of Harvard and MIT on 24th October 2016, Boston**

### 2015

- Invited Speaker at the Global Cancer Genomic Conference, Nov 2015 at **Jiujiang University, Nanchang, China**
- Invited Speaker at the **Beijing Genomics Institute, Nov 2015 at Shenzhen, China.**

### 2014

- Invited Speaker to the 3rd **Global Cancer Genomics Consortium annual meeting, Kyoto, Japan** organized from Nov 18-20, 2014

### 2013

- Invited guest speaker/faculty at the **Global Cancer Genomics Consortium – Instituto de Medicina Molecular (GCGC – IMM), Symposium, Lisbon, Portugal** from September 19 – 20, 2013

### 2012

- Invited Faculty at **Illumina Asia Pacific Scientific Summit, Gold Coast Queensland, Australia, Apr 2012**

### 2011

- Invited participant at the US-India BioPharma Summit 2012, organized by **USA-India Chamber of Commerce, Boston, USA, May 2011**

## INVITED NATIONAL PRESENTATIONS

~[200 odd invited presentations between 2011 and 2023](#)

## PROFESSIONAL CO-CURRICULAR ACTIVITIES

18. Organizer and Chairperson of the Basic Science event at Indian Cancer Congress 2023, scheduled for November 2nd, 2023, at Jio World Convention Centre in Mumbai.
17. Co-Organizer of the XIX Annual Conference on Evidence Based Management of Cancers in India- Tata Memorial Centre 2021, “Technology and Cancer Care - Promise and Reality of the Brave New World”
16. Organizer of the 2<sup>nd</sup> UK-India Cancer Bioinformatics Workshop on 'Next-Generation Sequencing Data Analysis' – jointly funded by Tata Memorial Centre and Kings College London—from Oct 31-Nov 2nd 2019.
15. On the expert panel of Dept of Science and Technology, Govt of Haryana for Haryana Vigyan / Yuva Vigram Ratan Awards for 2017 and 2018
14. Regular special invitees to several SERB DST “CRG-BHS-PACs” meetings
13. Innovative Young Biotechnologist Award (IYBA) DBT Expert Screening Committee Member for 2018, 2019
12. Organizer of the Cancer Informatics pre-Conference Workshop at the 38<sup>th</sup> Annual IACR Conference, Chandigarh
11. Organizer of the 7th Molecular Pathologist Association of India (MPAI) meeting 2019 at ACTREC, Tata Memorial Centre, Mumbai (<http://mpai.co.in/conference.html>), along with a pre conference workshop on NGS Data Analysis
10. Organizer of the UK-India Cancer Bioinformatics Workshop on 'Next-Generation Sequencing Data Analysis' – jointly funded by Tata Memorial Centre and Kings College London—from Oct 28-31 2018.
9. Organizer of DBT Sponsored Cancer Informatics Workshop on Next Gen Data Analysis from Jan 28-30, 2013
8. Co-organized the TMC 75<sup>th</sup> Platinum jubilee conference with theme, “A conference of new ideas in cancer - challenging dogmas” from Feb 24-26, 2016 in Mumbai.
7. Advisory Board of DiseaseBiology.info; of Aegle Sciences; and, inDNA Research Labs Pvt Ltd.
6. Organized the DBT Sponsored Cancer Informatics Workshop on Next Gen Data Analysis from Jan 28-30, 2013 ([http://www.actrec.gov.in/pi-webpages/AmitDutt/cwi\\_workshop.html](http://www.actrec.gov.in/pi-webpages/AmitDutt/cwi_workshop.html))
5. Organized the Second Global Cancer Genome Consortium (GCGC) TMC Symposium at ACTREC, Nov 2012—an initiative by three leading academic institutions; George Washington University, USA, Oxford University, UK and Tata Memorial Centre India (<http://www.gcgc.in>)
4. Organized the first Global Cancer Genome Consortium (GCGC) TMC Symposium at ACTREC, Nov 2011—an initiative by three leading academic institutions; George Washington University, USA, Oxford University, UK and Tata Memorial Centre India (<http://www.gcgc.in>)
3. Organized (along with a group fellow scientists) The Young Investigator Meeting Boston 2010 at The Broad Institute of Harvard and MIT-- <http://www.yimboston.org>.
2. Active organizer and volunteer for the USA-India Biopharma Summit for the years 2008, 2009, 2010 and for 2011- <http://www.usaindiachamber.org/current-events.shtml>
1. Initiated and established (along with a group of fellow graduate students) Indian Student Association of Zurich- <http://www.insaz.ethz.ch/>

#### SELECTED NEWS MEDIA REPORTS

[New tech ‘Dome’ to identify rare mutations of cancer](#) [The Indian Express]

[Indian team uses repurposed drug to treat oral cancer](#) [The Hindu]

[UBE3C-LRP5 is a novel oncogenic driver and potential therapeutic target in head and neck cancer](#) [Nature Cancer Community]

[Early cancer detection: Multi-cancer blood test in US trial holds out hope, says Lancet](#) [The Indian Express]

[miR-944/MMP10/ AXL- axis Predict Metastasis in Tongue Cancer](#) [Nature Cancer Community]

[Breast cancer: more insights on how hormonal therapy works](#) [The Hindu]

[Researchers develop India-specific cancer genome toolkit](#) [India Science Wire-Vigyan Parisar]

[Tata Memorial develops novel biomarker for tongue cancer spread to spare 70% patients from neck surgery](#) [The Indian Express]

[Breast cancer: more insights on how hormonal therapy works](#) [The Hindu]

[Cancer vanishing drug trial exciting but far from a breakthrough](#) [The Indian Express]

[New study recommends next-generation sequencing for extending lung cancer treatment to more patients](#) [The Indian Express]

[Lung squamous patients harboring druggable mutations have lower median overall survival](#) [News Medical]

[75 under 50: Scientists Shaping Today's India](#) [DST, Govt of India]

[The role \*Fusobacterium\* plays in oral cancer patients in India](#) [The Hindu]

[TARGET Indigene NGS panel](#) [ANI News]

[Study finds popping a weekly cancer pill instead of daily is enough to prevent regrowths](#) [Research Matters]



[Tool to ease SARS-CoV-2 genome mutation analysis](#) [The Hindu]  
[A computational tool that can rapidly identify and analyse coronavirus mutations](#) [IndiaBioscience]  
[Software that helps analyse coronavirus genome for mutations](#) [Nature India]  
[Do declining Covid-19 numbers suggest pandemic is nearing its end in India?](#) [Indian Express]  
[Indian scientists create new computational tool to track Covid-19 mutations worldwide](#) [The Print]  
[Vaccine efficacy: What's holding India back from ramping up genome sequencing](#) [The Federal]  
[A Blueprint To Develop A Rapid qRT-PCR kit To Detect SARS-CoV-2](#) [SciSoup]  
[Detecting RNA virus in saliva samples using Raman spectroscopy](#) [The Hindu]  
[Potential therapy for drug-defying gallbladder cancer](#) [Nature India]  
[How progesterone protects breast cancer patients unravelled](#) [The Hindu]  
[Existing drug can be used for treating gallbladder cancer](#) [The Hindu]  
[TMC overcomes resistance to hormonal therapy for breast cancer](#) [The Hindu]  
[Biomarker tells of tongue cancer spread](#) [The Hindu]  
[New genetic marker for oral cancer](#) [Nature India]  
[Potential therapy for lung cancer](#) [Nature India]  
[A new and free computational tool for HPV detection](#) [India Alliance]  
[For lung cancer patients in India, key to treatment could be malfunctioning gene](#) [Indian Express]  
[Novel genetic marker identified for lung adenocarcinoma](#) [India Bioscience]  
[Non-typhoidal Salmonella in gallbladder cancer](#) [India Bioscience]  
[Fighting cancer is team work at Tata Memorial](#) [Times of India]  
[How genetic data of Indian lung cancer patients can now help them get better treatment](#) [*Lignum Vitae*]  
[It is a moment of pride for Jamia Millia Islamia](#) [Okhla Times]  
[\[Wikipedia\]](#) [[The Wire](#)] [[The Hindu](#)]

- 1. Genetic testing at an affordable pricing:** Our efforts along with our colleagues from TMH has led to the development of a diagnostic test to detect *EGFR* mutations for lung cancer patients, which **reduces its cost from ~\$250 to ~\$12 per test that is currently being offered at the Tata Memorial Hospital** on routine basis (*Br J Cancer* 2014; *PLoS One* 2013 Apr; *PLoS One*; 2013 Oct). This has been an immensely successful effort of translating experimental standardization from a basic research laboratory to clinical diagnostics, which has benefited several thousand patients till date.
- 2. VARS:** a joint initiative by ACTREC and **Vekaria Health Care LLP Pvt Ltd**. A real time RT PCR based COVID detection kit developed in my lab has successfully been transferred to industry through a formal institutional MOU, and currently in process of being marketed under a trade name “VARS”. It's the first diagnostic kit from an Indian academic institute with peer reviewed methodology, published in a Cell press group journal *Heliyon*. In brief, we identified a unique conserved region in the SARS-CoV-2 Nucleocapsid gene. We cloned and generated synthetic RNA molecules for 3 such regions (N1, N2 and N3) and spiked them in the human genomic DNA and total RNA at varying concentrations as a reference sample, to mimic a COVID-19 positive sample. The reference sample was used to compare the detection limit of two different chemistries: a probe-free SYBR Green dye-based methodology and TaqMan probe-based RT-PCR assay. The probe-based assay was found to be more sensitive with detection of up to 15 RNA copies, as compared to 150 RNA copies of the probe-free method. This was further developed into a one-step, one-tube, multiplex diagnostic kit. The detection accuracy of the kit was evaluated using a panel of 26 clinical specimens by performing 184 validations with dilutions of samples ranging from 1-100 ng. The kit was found to be 100% specific and 100% sensitive based on accurate identification of 5 of 26 positive samples and calling rest 21 negative samples as negative. Furthermore, to minimize variability and automate the qRT-PCR downstream analysis of multiple samples in the same run, we developed an open access freely available GUI based analytical tool [COVID qPCR Analyzer tool](#), an in silico automated tool to detect the virus in an unambiguous and reproducible manner with minimal requirement of third-party tools in a platform-independent for its universal application across all kinds of real-time PCR machine.
- 3. ClinOme**, a Graphical User Interface (GUI) based automated tool, developed in my laboratory has recently moved from my laboratory settings to the Medical Oncology Department at the Tata Memorial Hospital. [ClinOme](#) is being used to analyse clinical grade raw NGS data [using multiple cancer panels] and generate comprehensive clinical report to help inform clinical decision. It has been used to generate automated clinical reports for 300 odd patients at the Tata Memorial Hospital. The ClinOme has been successfully transferred to industry through a formal institutional MOU to 4baseCare Genomics Pvt Ltd —for commercial purpose. A collaboration agreement was finalized and purchased by the 4baseCare Genomics Pvt Ltd for joint development and ownership of the Intellectual Property rights with ACTREC, Tata Memorial Centre. *Manuscript under communication*.
- 4. Raman Spectroscopy Based Detection of RNA viruses:** Similar to the Israeli-developed spectroscopy-based one minute breathe analyzer to detect coronavirus, we developed a proof of principle study using Raman Spectroscopy, published in *Journal of Biophotonics*. We used saliva and spiked it with non-infectious RNA viruses and analyzed using conventional Raman Spectroscopy, i.e., using no additional reagent to enhance the signal. Based on an unbiased statistical analysis of all the 1400 spectra obtained for each sample, we found a set of 65 spectra was adequate to identify the viral positive signal. Interestingly, most of these spectra were specific for the RNA molecule. This is a unique concept with a prediction accuracy of 91.6% (acceptable based on other approved Raman based diagnostics). To streamline the analysis, we developed an automated tool “[RVD: RNA Virus Detector](#)” using a GUI interface. This tool is freely

downloadable. This tool, the first of its kind, takes raw data from a Raman Spectrometer analysis based on the 65 spectra signature and provided an objective output if viral RNA is present or absent in the sample—currently in use by 24 labs across 10 different countries (based on the online registration done prior to downloading the tool). This whole process of data acquisition and analysis can be performed within a minute. No additional reagent ensures no recurring cost. A portable (benchtop) Raman spectrophotometer installed at the port of entry such as airports or at any point of care (in the field) can quickly screen passengers within minutes. The technology is currently being transferred through an institutional process to **Quantificare Health Stations Pvt. Ltd.**, a Hyderabad based company with an existing network of Internet of Things (IOT)-based Smart kiosks called Pulse Active Stations. A handheld raman spectrometer is proposed to be installed at the kiosks to detect the presence of RNA virus in human saliva, as a self-screening process at multiple ports of entry, such a airports and railway stations.

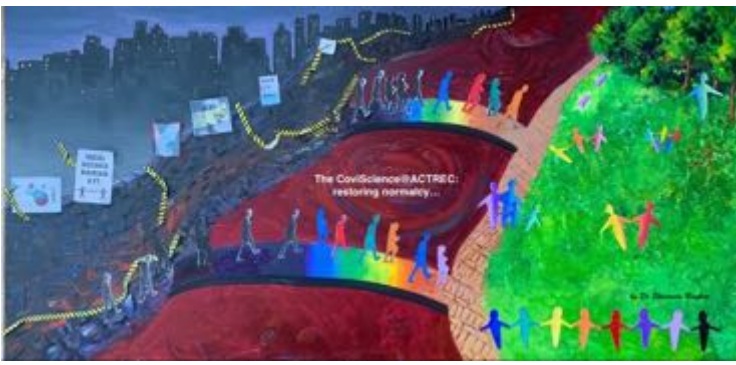
**5. HPVDetector:** We developed a novel freely distributable computational tool “HPVDetector” to detect all known HPV types along with their sites of integration in the host genome using next generation sequencing data set (*Br J Cancer* 2015). This user friendly tool has been designed for researchers who has limited computational expertise using graphical user interface (GUI) that requires minimal third party tools. Using [HPVDetector](#), one can analyze paired end whole exome, whole genome or whole transcriptome dataset to detect all known HPV types along with their sites of integration in the host genome. It has been downloaded and currently been used by 281 odd laboratories across 39 countries (as accessed on Nov 30<sup>th</sup>, 2021), and multiple international companies has expressed written interest for permission to integrate the tool in their commercial pipeline.

**6. One step Concatenation of KRAS and EGFR exons:** We developed a novel and cost-effective single multiplex-PCR based method, CRE, for co-amplification of five *KRAS* and *EGFR* exons followed by concatenation of the PCR product as a single fragment—an improvised protocol for direct sequencing. CRE is a robust methodology that has a potential to be routinely used in clinical diagnostics with reduced variability, cost and turnaround time requiring minimal amount of template DNA extracted from FFPE or fresh frozen tumor samples (*F1000Res* 2015).

**7.** We developed the **TMC-SNPdb-- first Indian SNP reference database** based on whole exome sequencing that fills the void due to lack of Indian germline variant database, which comes along with a companion user friendly subtraction tool that can be executed with command line option or using an easy-to-use graphical user interface (GUI) to deplete Indian population specific SNPs, in addition to the dbSNP and 1000 Genomes Project (*Database* 2016). The [TMC-SNPdb database](#) has been downloaded and is being used at 131 different research labs across the 13 countries, as accessed on Nov 30<sup>th</sup>, 2021. More recently, this was updated with the release of [TMC-SNPdb 2.0](#) (*Database* 2022)—a database of germline variants from 1800 individuals.

**8.** Recently, we developed an *in-silico* GUI-based automated pathogen analysis pipeline for seamless analysis of data from heterogenous NGS platforms. The [Infectious Pathogen Detector](#) (IPD) performs integrated variants analysis, along with systematic quantification of pathogen genomes. The pathogen reference genome is composed of 1060 infectious pathogens, constituting 192 viral strains and 868 bacterial specie. IPD additionally has an in-built SARS- CoV-2 analysis module, for assignment of viral clades of the samples analyzed and an automated report generation (*Briefings in Bioinformatics* 2021, *BMC Bioinformatics* 2021). The IPD is currently in used at 45 different research labs across the 11 countries, as accessed on Nov, 2021.

**9. [TARGT Indiegene NGS panel:](#)** In collaboration, a precision oncology company 4baseCare developed and launched one-of-its-kind Indian population specific cancer gene panel from whole exome and whole transcriptome data from 1,500 cancer patients (*Manuscript in preparation*).



**[CoviScience@ACTREC \(donation for charity\)](mailto:CoviScience@ACTREC)**  
*an initiative for the underprivileged*

In May 2021, I along with other scientists initiated a reach-out program [CoviScience@ACTREC](mailto:CoviScience@ACTREC). It was a mad race against time to fight the pandemic back then. The faster and as many we could vaccinate— was the key! The COVID vaccine was offered free to all above 18 years at Govt centres. This monumental effort would take significant time to meet the goal, especially for the underprivileged and uneducated. To fill this duration gap between seamless implementation of govt policy, the [CoviScience@ACTREC](mailto:CoviScience@ACTREC) was launched to vaccinate and educate the underprivileged with the following objectives:

1. Bust the vaccine hesitancy among underprivileged in our neighborhood by reaching out to them to encourage and sponsor their vaccine.
2. Distribute sanitation kit (masks + sanitizers + soap) to a target population of 10,000.
3. Disseminate correct scientific information to the mass.

These underprivileged individuals, the frontline workers of our society, working as garbage collectors, sweepers, fruit/ vegetable vendors, private security guards, domestic help, etc., were actively enrolled and cajoled, and their vaccination was facilitated at the private clinic at ACTREC. The eligible vaccine beneficiaries were registered through the residential complex society office, direct pitching at marketplaces, and online for those between [18-44 years](#) and those above [45 years](#), with provision for anyone to register any eligible beneficiary on their behalf. We hired a coordinator to screen for the eligibility of registered beneficiaries with a follow-up phone call and schedule them for the vaccination.

As an integral part of this outreach, to purchase the vaccines and offer to the underprivileged at free of cost, funds were generated through crowdfunding by reaching to friends and family in India and abroad. So far, we have generated over **Rs. 21 lakhs** as a donation from friends across the globe. We created a provision for the funds to be directly donated and managed by the accounts department at ACTREC-Tata Memorial Centre for the [CoviScience@ACTREC](mailto:CoviScience@ACTREC)-- following the institutional norms and regulations for audit and usage. This way, the contributions made by the donors in India towards the drive could be claimed as a deduction (50%) u/s 80G of the Income Tax Act. A transparent donation drive was carried with frequent sharing of updates with the donors and made the information regarding the [funds generated as publicly accessible](#).

As of 23rd Mar 2022, the donations generated through crowdsource funding made possible an expedited out-of-turn vaccination of **[4,909 doses: 2103 single-dose and 2505 fully vaccinated underprivileged individuals](#)** who otherwise had no chance to receive the same during this period—with certificates for vaccination shared with 1708 single dose and 1355 fully vaccinated beneficiaries. They also received a set of 5 triple-layered masks or 2 N95 masks along with a 100 ml sanitizer bottle and a snack box. [This is how the funds generated were transformed into action.](#)

As the data suggests, [CoviScience@ACTREC](mailto:CoviScience@ACTREC) has been a successful and focused drive so far. The drive has established a name in and around Kharghar and has become popular among the underprivileged community in our neighborhood for its persistent and cajoling efforts. We thus plan to continue with our initiative as long we can financially sustain ourselves. Daily updates about the initiative can be found here: <https://coviscienceactrec.wixsite.com/home/get-involved>