

**Dr.G.Kumaresan**

Reader

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Email: [kumar@oncocellomics.org](mailto:kumar@oncocellomics.org)[kumar@oncogenomics.in](mailto:kumar@oncogenomics.in)**INVESTIGATOR'S PROFILE:**

Dr.G.Kumaresan obtained B.Sc. (Zoology) and M.Sc. (Biology) from Manonmaniam Sundranar University and Madurai Kamaraj University with University first ranks in both. His doctoral research was on “*Molecular Biology of the Transposon Mariner Like elements*” with Prof.S.Mathavan in School of Biological Sciences, Madurai Kamaraj University. During graduate programme, many novel transposable elements were identified from silkworm. This investigation also brought a novel PCR based technique to isolate various copies of multi-copy genes from genome.

Subsequent postdoctoral research trainings were with Dr.Sandy Chang and Dr.Rakesh Kumar in University of Texas M.D.Anderson Cancer Center, Houston, U.S.A. Major research focus in M.D.Anderson was to develop mouse and human cellular models to study the cancer associated characteristics of selected genes. The second postdoctoral investigation was in the area of “*Cancer Genomics & Proteomics*” with Dr. Patrick Tan’s Molecular Genomics group, in National Cancer Center, Singapore. Various genomics, proteomics and integrative approaches were utilized for the identification of candidate genes. By this integrative genomics and proteomics investigation, few novel tumor suppressor genes, metastasis inhibitor genes, oncogenes, drug-sensitivity determining genes and potential biomarker candidates were identified and characterized in breast and gastric cancers.

**RESEARCH DIRECTIONS:**

My group is working in the following aspects: (1) Molecular and Cellular Genomics of Cancer & Diabetes, (2) Diagnostic and Therapeutic Cancer Biomarker Discovery, and (3) Assay Development for Targeted Therapeutic Compound Screening.

We mine the existing, exhaustive human genomics resources: i) to understand the molecular, cellular and genomic processes in carcinogenesis, and ii) for the development of next generation diagnostics and therapeutics. My group utilizes the human cellular models and genomics technologies to evaluate the identified therapeutic targets and to characterize the promising biomarker candidates. We are working towards the identification of powerful and realistic next generation biomarkers for the classification, prognosis and therapeutics of breast, gastric, and liver cancers. In parallel, our group is developing an array of engineered cancer

cells and assays, representing different oncogenic signaling pathways, for the screening of therapeutic compounds. The developed cell lines will be valuable reagents for therapeutic compound screening in cancer drug discovery. These projects are being funded by DAE, BRNS, DST, DBT, and UGC (CEGS core). I also look for the opportunities of collaboration with interested basic, translational and clinical research teams to strengthen the resources and to achieve the goals by collective effort.

**ONGOING RESEARCH PROJECTS:**

No.	Project	Support	Duration
1	Development of drug discovery assay tools and identification of potential therapeutic compounds	DAE	2009-2012
2	Molecular genomic characterization of microtron based cancer therapy in an <i>in vivo</i> tumor model	BRNS	2009-2011
3	Molecular and cellular characterization of the therapeutic potential of <i>PLA2G2A</i> , a novel biomarker gene in metastatic gastric cancer	DST	2009-2012
4	Functional genomic delineation of convolutions in Wnt signaling pathway for gastric cancer diagnostics	DBT	2009-2012

**RECENT PUBLICATIONS:**

1. Kumaresan Ganesan, Tatiana Ivanova, Yonghui Wu, Vikneswari Rajasegaran, Jeanie Wu, Ming Hui Lee, Kun Yu, Sun Young Rha, Hyun Cheol Chung, Bauke Ylstra, Gerrit Meijer, Kon Oi Lian, Heike Grabsch, and Patrick Tan. 2008. Inhibition of Gastric Cancer Invasion and Metastasis by *PLA2G2A*, a Novel  $\beta$ -catenin/TCF Target Gene. *Cancer Research*, 68 (11): 4277-4286.
2. Kun Yu, Kumaresan Ganesan, Lay Keng Tan, Mirtha Laban, Jeanie Wu, Xiao Dong Zhao, Hongmin Li, Carol Ho Wing Leung, Yansong Zhu, Chia Lin Wei, Shing Chuan Hooi, Lance Miller, Patrick Tan. 2008. A Precisely Regulated Gene Expression Cassette Potently Modulates Metastasis and Survival in Multiple Solid Cancers. *PLOS Genetics*, 4 (7): e1000129, 1-12.
3. Qingsong Hou, Yonghui Wu, Heike Grabsch, Yansong Zhu, Siew Hong Leong, Kumaresan Ganesan, Debra Cross, Lay Keng Tan, Jiong Tao, Veena Gopalakrishnan, Bor Luen Tang, Oi Lian Kon, Patrick Tan. 2008. Integrative Genomics Identifies *RAB23* as an Invasion Mediator Gene in Diffuse-type Gastric Cancer. *Cancer Research*, 68 (12): 4623-4630.
4. Wei Chen, Manuel Salto-Tellez, Nallasivam Palanisamy, Kumaresan Ganesan, Qingsong Hou, Lay Keng Tan, Lang Hiong Sii, Kosei Ito, Benita Tan, Jeanie Wu, Andrew Tay, Kok Chai Tan, Erik Ang, Bien Keem Tan, Puay Hoon Tan, Yoshiaki Ito, Patrick Tan. (2007). Targets of genome copy number reduction in primary breast cancers identified by integrative genomics. *Genes, Chromosomes and Cancer*, 46: 288–301.

5. Keli Ou\*, Djohan Kesuma\*, Kumaresan Ganesan\*, Kun Yu, Sou Yen Soon, Suet Ying Lee, Xin Pei Goh, Michelle Hooi, Hiroyuki Jikuya, Tetsuo Ichikawa, Osamu Nishimura, Patrick Tan (2006). Utilization of 2-Nitrobenzenesulfonyl Chloride (NBS) Labeling Coupled with Two-dimensional Gel Electrophoresis and Mass Spectrometry for quantitative Proteome analysis. *Journal of Proteome Research*, 5(9): 2194-206. (\*Equal contribution first authors).
6. Kun Yu, Kumaresan Ganesan, Lance Miller, Patrick Tan (2006). A Modular Deconstruction of the Breast Oncotranscriptome Reveals a Novel Apoptotic Molecular Signature Associated with Low Histologic Grade in Multiple Patient Populations. *Clinical Cancer Research*, 12(11): 3288-3296.
7. Mohan K G, Kumaresan G, Mathavan S, Muraleedharan D (2004). Characterization and cDNA cloning of apolipoprotein III gene in the red cotton bug, *Dysdercus cingulatus*. *Entomon*. 29(4), 373-81.
8. Kumaresan,G., and Mathavan,S., (2004). Molecular diversity and phylogenetic analysis of *Mariner* like transposons in the genome of the silkworm *Bombyx mori*. *Insect Molecular Biology*, 13(3): 259-71.
9. Kumaresan,G., Venugopal,T., Vikas,A., Pandian,T.J. and Mathavan,S. (2000). Cloning of partial putative gonadotropin hormone receptor gene from fish. *Journal of Biosciences*, 25: 41-45.
10. Kumaresan,G., and Mathavan,S. (2002). RGF-PCR: A technique to isolate different copies of a multicopy gene from the genome. *Current Science*, 82 (4): 442-447.

**PATENT FILED:**

DIAGNOSTIC BIOMOLECULES for tamoxifen responsive breast cancer patients: Invented by novel proteomics method - by Shimadzu Corporation, 2007. Inventors: Nishimura Osamu, Ichikawa Tetsuo, Ou Keli, Tan Patrick and Kumaresan Ganesan. No: PCT/JP2007/064288. This is a method of detecting and/or quantitating the presence/predisposition to a sub-category in breast cancer.