

DETAILED TOUR REPORT

1. Name and designation of the Scientist: Murali Dharan Bashyam; Staff Scientist V
2. Name of the Institute/Centre: Centre for DNA Fingerprinting and Diagnostics
3. Date of Visit: January 4, 2013
4. Period of visit: Five months
5. Place of visit: The Wistar Institute, Philadelphia, PA 19104, USA
6. Purpose of visit: To obtain training in computational biology/bioinformatics based analysis of next generation sequencing data under the ICMR international fellowship scheme.
7. Source of sponsorship of the visit: ICMR international fellowship
8. What is the scientist's contribution, relevance to ICMR/DHR, India?

The Scientist has been working for the past ten years on molecular characterization of different cancers afflicting the Indian population. His pioneering work has revealed presence of novel rectal cancer subtypes that appear to be driven by hitherto unidentified tumorigenesis pathways (Raman et al., 2013, in press). In addition, his work showed a possible tumor suppressor function in pancreatic cancer for ARID1B, a component of the human SWI/SNF chromatin remodeling complex (Khursheed et al., 2013; 5/13/129/2009-NCD-III). The scientist has also performed a comparative profiling of various genetic aberrations in esophageal squamous and adenocarcinoma and revealed important distinguishing features.

More importantly, the scientist has undertaken a three year ICMR sponsored study (2010-2013) to perform a comprehensive clinico-pathological and molecular genetic analysis of squamous cell carcinoma of the mobile tongue. In this study, the scientist has profiled status of EGFR, p53, microsatellite instability, HPV infection and loss of heterozygosity of several chromosomal loci harboring tumor suppressor genes in more than one hundred tongue cancer samples. In addition, genomic profiling of transcripts and DNA copy number was also performed. Results have revealed several unique features especially in tumors occurring in young patients in the absence of p53 inactivation. Based on the ICMR international fellowship training, the scientist is now commencing next generation sequencing based analysis of the novel tumor subtypes identified based on previous work.

The scientist has therefore made seminal contributions in the field of non-communicable diseases (including one study sponsored by ICMR), an important thrust area of ICMR as well as a crucial health problem in the Indian context.

References:

Khursheed M, Kolla JN, Kotapalli V, Gupta N, Gowrishankar S, Uppin SG, Sastry RA, Koganti S, Sundaram C, Pollack JR, Bashyam MD. ARID1B, a member of the human SWI/SNF chromatin remodeling complex, exhibits tumour-suppressor activities in pancreatic cancer cell lines. *Br J Cancer*. 2013;108:2056-62.

Raman R, Kotapalli V, Adduri R, Gowrishankar S, Bashyam L, Chaudhary A, Vamsy M, Patnaik S, Srinivasulu M, Sastry R, Rao S, Vasala A, Kalidindi N, Pollack J, Murthy S, Bashyam M. Evidence for possible non-canonical pathway(s) driven early-onset colorectal cancer in India. *Mol Carcinog*. 2013; in press.

9. Benefits to the Institute/Centre from the skills acquired by the scientists during the said visit:

Translational cancer research is an important mandate for the Centre for DNA Fingerprinting and Diagnostics. In addition to the ICMR-IF, five CDFD scientists are working in this important area. More importantly, several CDFD scientists are applying NGS technology for fulfillment of their respective research objectives. Therefore, the ICMR-IF's newly acquired skills in NGS data analysis will be very useful to further the cancer research program in CDFD in addition to helping in establishing the NGS technology.

10. How the skills acquired by the scientist will be utilized?

As mentioned above, the skills acquired by the scientist in NGS data analysis will be utilized to further the cancer research program in CDFD in addition to helping in successful establishment of NGS technology.

11. Whether the Director/OIC satisfied with the tour report? Comments of Director/OIC on the report.

My colleague and fellow staff scientist Dr Murali Dharan Bashyam, has completed his five month training at the Wistar Institute, Philadelphia, USA in the area of next generation sequencing (NGS) data analysis. His tenure at The Wistar Institute extended from January 4, 2013 to June 3, 2013. During this period, Dr Bashyam initially obtained training on the Linux operating system and on the use of specialized scientific scripting programs such as Python. He then used this knowledge to work on RNA seq data generated by other groups on Glioblastoma and normal brain samples. His work has revealed novel transcript isoforms de-regulated in Glioblastoma. Towards the end of his tenure, Dr Bashyam was also able to apply the newly acquired knowledge to analyze exome and RNA seq data obtained in his laboratory from colorectal cancer samples. Dr Bashyam has therefore successfully completed his tenure at the Wistar Institute. I am sure based on the training; he will now be able to provide a significant impetus to the cancer biology program at CDFD. In addition his newly acquired knowledge will be useful to successfully establish an efficient data analysis component in CDFD's own NGS facility.

I have scrutinized the detailed tour report being submitted by Dr Bashyam to the ICMR and am satisfied with the work performed by him during the five month period at the Wistar Institute, USA. I am convinced that this training will not only enhance the outputs from his own research laboratory but will also enhance research in other CDFD laboratories engaged in cancer research. More importantly, Dr Bashyam's expertise in NGS data analysis, acquired during the ICMR-sponsored training, will be extremely useful in advancing the capabilities of CDFD-NGS facility.

Dr J Gowrishankar,
Director,
CDFD