



Invitation to MTech Thesis Defense of Rohit Kumar Verma: July 15, 2019 (Monday): 16.00-17.00 IST

In Partial Fulfillment of the Requirements for the Degree of
M.Tech CB

Rohit Kumar Verma (MT17145)

Will defend his thesis

Title: “Cell free analysis in detection of diseases”

IIIT-D Faculty and Students are invited

Date: July 15, 2019 (Monday)

Time: 16.00 – 17.00 IST

Place: CB Meeting Room (3rd Floor, R&D Building)

Examiner: **Internal:** **Sriram K.**
 External/Internal: **K K Chaturbedi, Indian Council of Agricultural Research**
 Advisor: **Vibhor Kumar**

Abstract

Our blood contains fragments of DNA that comes from a cell belonging to various parts of the bodies. Cell-Free DNA (cfDNA) is already used in noninvasive diagnostic. It has huge potential for the detection of diseases especially in certain conditions like cancers, organ transplantation and during pregnancies. There are different kinds of signals such as proteome and genome but the premise of our work is to understand the signals like 5-Hydroxymethylcytosine (5hmC) and nucleosome occupancy for the detection of diseases. Despite the potential of cfDNA detection to identify cell type, very few studies are described in the literature to date using signals like nucleosome occupancy. In the recent past studies, a variety of potential health care is characterized by the modification of cfDNA by 5-methylcytosine (5mC). However, there are few studies that were described in the literature about the epigenetic DNA modification in cfDNA. 5-Hydroxymethylcytosine (5hmC) has huge potential in gene regulation and cancer pathogenesis. Here we explored a comprehensive understanding of 5hmC and nucleosome occupancy signals of DNA fragments in the detection of diseases and this result will shed light in the detection of cell type. We focus on two important aspects: prediction model construction for 5hmC signals and fast Fourier transform for the detection of nucleosome occupancy, under different scenarios.