

DECLARATION BY THE CANDIDATE

I, **Ipsita Chakravarty**, certify that the work embodied in this Ph.D thesis is my own bonafide work and carried out by me under the supervision of **Prof. (Dr.) Subir Kundu** for a period from **September 2012** to **May 2018** at the **School of Biochemical Engineering, Indian Institute of Technology (Banaras Hindu university), Varanasi**. The matter embodied in this thesis has not been submitted for the award of any other degree/diploma.

I declare that I have faithfully acknowledged, given credit to the research workers wherever their works have been cited in my work in this thesis. I further declare that I have not willfully copied any other's work, paragraph, text, data, results, etc. reported in the journals, books, magazines, reports, dissertations, thesis, etc., or available at websites and have not included in this Ph.D thesis and have not cited as my own work.

Date:

Place: IIT (BHU), Varanasi

(Ipsita Chakravarty)

CERTIFICATE FROM THE SUPERVISOR

It is certified that the above statement made by the student is correct to the best of my knowledge.

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