VIT®
UNIVERSITY
(Estd. u/s 3 of UGC Act 1956)
VELLORE ■ CHENNAI
www.vit.ac.in

Date: 13.07.2016

From
Dr. M. Anbalagan
Head of the Department
Department of integrative Biology
VIT University

To
Dr. Agnelo Menezes
Principle
St. Xavier's College
Mumbai.

Dear Sir,

Our university curriculum requires students to do a project in any field related to Biology, as a requirement for award of MSc degree in Biotechnology. In this regard I wish to introduce one of our department student, Ms.Indurthi Lavanya , who is interested in doing her project in your esteemed Institution. In this regard,I request you to kindly give her permission and offer her assistantship in carrying out her project. Given an opportunity she will be working in the lab from 12th October 2016 till 31st May 2017.

As per the University requirement she needs to submit a thesis on her work at the end of the project. The Lab head/faculty with whom she will be working will be her external guide and one of our department facultywill act as internal guide. The student will obey rules and regulations of your university. Our department/faculty will not have any rights for claim of results coming out of the research carried out by the student in your University or will interfere in the research interest of the lab.

The M.Sc. project will be carried out in Caius research laboratory of St. Xavier's college and the student will pay sum of Rupees 5000 per month. The intellectual property from entire work will rest with St. Xavier's College.

Thanking you

With Best Wishes
M. Anbalagan
(M. Anbalagan)

Dr. M. Anbalagan, Ph.D.,
Head of the Department
Department of Integrative Biology
School of Biosciences & Technology
VIT University, Vellore - 632 014

17/10/16.

Certificate of the External Guide

This is to certify that the dissertation report entitled "**Construction of shuttle vector for *E. coli* and *Bacillus subtilis***" submitted by **Indurthi Lavanya** (12msi0074) to the VIT University, Vellore-632014, for the degree of *Master of Science* in Biotechnology is her original work, based on the results of the experiments and investigations carried out independently by her during the period (November 2016 –July 2017) of study under my guidance.

This is also to certify that the above said work has not been previously submitted for the award of any degree, diploma, fellowship in any Indian or foreign University.

Signature of the Guide

Place: Mumbai

Name and Designation
Dr. Priya Sundarrajan
Associate Professor
Department of Life Science and Biochemistry
St. Xavier's College – Autonomous
Mumbai.

Date: 15th July 2017

ST. XAVIER'S COLLEGE - AUTONOMOUS MUMBAI-400 001

Abstract

The main aim of this study was to design and construct a shuttle vector which can be manipulated and expressed in *E. coli* and *Bacillus* host systems. The currently available vectors can be manipulated only in *E.coli*, then used in a system which is more difficult or slower to use. Plasmids used for the construction of *E.coli-Bacillus* shuttle vector are pUC19, pHCMC04, pRAD; as a result the vector can be replicated and expressed both in *E. coli* and *Bacillus subtilis*. This shuttle vector contains both the ampicillin and chloramphenicol resistance genes as selectable markers for *E. coli* and *Bacillus* respectively. The multiple cloning site is derived from standard vector pUC19, but the order of the restriction sites in this vector has been modified. Kpn1, Sma1, BamH1, Xba1 have been removed from original MCS site and have been placed along *Bacillus* promoter sequence. *Bacillus* origin of replication has been inserted at Eco01091 restriction site and gsiB promoter will be inserted into the BsrF1 restriction site, which is inducible with acid stress by decreasing the pH of the medium from 6.8 to 5.8. Hence, this promoter uses less costly inducer instead of IPTG.

External guide

Dr. Priya Sundarrajan

Mo: 9969379223.

Email: priya.s@xaviers.edu.

External Co-Guide

Dr. Vishwas Sarangdhar

Mobile: 9869559539