CHAPTER 37

MEDICAL SCIENCES
MICROBIOLOGY

Doctoral Theses

449. BARUA (Tanushree)
Studies on Detection and Characterization of AmpC β-lactamases in Clinical Isolates of Klebsiella spp. and Escherichia coli.
Supervisors : Prof. S. S. Thukral and Dr. Malini Shariff
Th 16811

Abstract

Evaluates and compares various phenotypic methods for the detection of AmpC β-lactamases in clinical isolates of Klebsiella spp. and Escherichia coli, and to detect and characterize AmpC β-lactamases produced by these isolates by analytical isoelectric focusing (IEF) and polymerase chain reaction (PCR) as well as by sequencing of ampC genes.

Contents

1. Introduction. 2. Review of literature. 3. Aims and objectives. 4. Materials and methods. 5. Results and observations. 6. Discussion. 7. Summary and conclusions. Bibliography and Appendices.

450. CHANDOLIA (Amita)
Functional Analysis of mce4 Gene of M.tuberculosis H37Rv Using Antisense Approach.
Supervisors : Prof. Mridula Bose, Prof. Vani Brahmachari and Dr. Pawan Malhotra
Th 16810

Abstract

Designs and synthesis antisenses RNA for mcel and mce4 gene. Analyses the effect of antisense on mcel and mce4 gene expression in bacilli in synthetic media and in cell culture.

Contents

1. Introduction. 2. Review of literature. 3. Construction of mce4A (Rv3499c) and mcelA (Rv0169) antisense and demonstration of its effect using E.coli as surrogate host. 4. Electroporation and analysis of mce antisense in Mycobacterium tuberculosis. 5. Effect of antisense on expression of other mce operons and a selection of virulence associated genes. Summary and conclusions.

451. MALLIK (Sarita)
Proteomic Approach to Study Strain Diversity and Arsenite-Mediated Multiple Antibiotic Resistance in Yersinia Enterocolitica Isolated form India.
Supervisor : Prof. J. S. Virdi
Th 16716

Abstract

Concludes that analysis of strains of Y. eterocolitica biovar 1A by MLEE revealed greater genetic heterogeneity as compared to other methods used previously. The method was found to have high discriminatory ability, clustering strains into four distinct groups. On the other hand, MLRT and whole cell protein profiling were less discriminatory but exhibited congruence with rep-PCR, and MLVA genotyping. Study of evolutionary relationship using BURST analysis indicated that clinical serotype O:6,30-6,31 strains might have evolved from ancestral aquatic serotype O:6,30-6,31 strains. Proteomic analysis of arsenite treated cells revealed that down regulation of porins and membrance transporters may prevent entry of antibiotics into the cell and thus mediate multiple antibiotic resistance.

Contents

1. Introduction. 2. Review of literature. 3. Aims and objectives. 4. Materials and methods. 5. Results. 6. Discussion. 7. Summary. 8. Bibliography. Appendix and publications.

452. SAINI (Sanjeev)
Study of Antiretroviral Drug Resistance in HIV-1 Strains by Genotypic Assay.
Supervisors : Dr. P. Bhalla, Dr. Usha K. Baveja and
Dr. S. Tazeen Pasha
Th 16717

Abstract

Identifies the HIV-1 infected paitents on the basis of serological tests after obtaining their writtern informed consent and pre and post test counseling. Assess the immune status of each patient on the basis of CD4/CD8 count. 3. Studies the prevalence of drug resistant HIV-1 strains in drug experienced and drug native HIV-1 infected patients by RT PCR using primers for complete protease & 5' reverse transcriptase gene. Direct sequencing of amplified product to detect and identify the type of mutation. Attempts to follow up the HIV-1 infected patients receiving antiretroviral therapy to correlate presence of drug resistant HIV-1strains with treatment failure.

Contents

453. SHARMA (Monika)
Study of Effect Mycobacterium Tuberculosis Infected Macrophages On T Cell Viability.
Supervisors : Prof. Mridula Bose and Prof. H. G. Raj
Th 16813

Abstract

Studies the effect of M. tuberculosis infection of in vitro matured macrophages on T cell viability in a co-culture experiment. Correlations in vitro the mechanism involved in the T cell apoptosis recovered from the patients suffering from pulmonary tuberculosis. Futher study whether such interaction involves direct cell to cell contact or can be mediated by cell free supernatant of infected macrophages.

Contents

454. SINGH (Sakshi Pal)
Studies on Detection and Characterization of Metallo β-lactamases in Clinical Isolates of Pseudomonas Aeruginosa.
Supervisors : Prof. S. S. Thukral and Dr. Malini Shariff.
Th 16812

Abstract

Evaluates and compares various phenotypic methods to detect MBL producing clinical isolates of Pseudomonas aeruginosa, to detect and characterize the MBLs produced by these isolates by analytical isoelectric focusing (IEF) and polymerase chain reaction (PCR) and to detect novel MBLs by sequencing the MBL genes of MBL producing isolates.

Contents

455. TYAGI (Tapesh Kumar)
Studies on the Novel Enzyme Acetoxy Drug : Protein Transcetylase from Mesophilic Fungus Starkeyomyces sp.
Supervisors : Prof. H. G. Raj and Prof. R. K. Saxena
Th 16719

Abstract

Focuses on the Purification, biochemical & immunological characterization of TAase, utilizing an acetoxy coumarin as a acetyl group donor. the specificity of TAase to acetyl-CoA, a biological group donor, was also investigated.A biochemical and molecular approach to identify the domain responsible for TAase function was also undertaken.

Contents

456. VERMANI (Maansi)

Studies on Aerobiological Aspects, Clinico Immunologic Assessment of Allergenic Potential and Biochemical Characterization of Allergenic Components of Aspergillus Species.

Supervisors : Prof. S. S. Thukral, Prof. M. K. Agarwal and Dr. V. K. Vijayan

Th 16871

Abstract

The present study is for the : identification and volumetric quantification of four important *Aspergillus* species viz. *A flavus, A fumigatus, A niger* and *A tamarii* in the air and measurement of airborne *Aspergillus* allergens; comparative evaluation of their allergenic significance; identification and immunochemical characterization of their major and minor allergenic proteins; evaluationof patients' heterogeneity of immune reponse to various allergenic components of the four *Aspergillus* extracts and cross-reactivity/Species-specificity among them; and purification, isolation and characterization of at least one major allergenic protein of a clinically important specied of *Aspergillus*.

Contents

457. VIKAS

Inhibition of HIV-1 by Antisense and Catalytic Nucleic Acids and Functional Characterization of HIV-1 Subtype C Tat Protein.

Supervisors : Dr. V. G. Ramachandran and Dr. A. C. Banerjea

Th 16718

Abstract

Identifies new DNA-enzymes against gag as well as short antisense molecules that can enhance the cleavage potential of DNA-enzymes. This study also revealed the presence of B/C recombinant tat among the North Indian population. Further, it was observed that Tat interacts with Vif and Vif could modulate NF-κB signaling. Similarly role of Tat in SOCS 3 was idnetified and it was observed that SOCS 3 played an important role in Tat mediated LTR activation.