CHAPTER 4

BIOMEDICINE

Doctoral Theses

035. ASHA RANI
Studies for Identification, Distribution and Diversity of Microbes Through 16S rDNA Sequences.
Supervisor : Dr. V. C. Kalia
Th 15663

Abstract

Focuses on identification and characterization of microbial diversity in different environmental sources including contaminated food sample, marine coastal water and various industrial ETPs. The study demonstrates that presence of toxic xenobiotic molecule in the environmental niches demands more diverse microbial community for their degradation.

Contents

1. Introduction. 2. Review of literature. 3. Materials and Methods. 4. Results and Discussions. 5. Microbial diversity analysis using various culture based methods. 6. Comparative analysis of microbial diversity by culture dependent and culture independent methods. 7. Conclusions. 8. References and Appendix.

036. ANAMIKA
Immunobiochemical Studies on Tree Pollen Allergens with Special Reference to Prosopis Juliflora.
Supervisors : Dr. Susheela Sridhara and Dr. Bhanu P. Singh
Th 15618

Abstract

Pollen extract of P. juliflora characterized standard in vitro and in vivo methods and an in-house reference extract was prepared. The pollen extract standardized here is potent and contains four major allergenic proreins viz. 66,52,29 and 26 kDa. Prosopis showed a close allergenic relationship with A. excelsa,

C. Siamea and S. Presica tree species. Significant humoral and cellular cross-reactivity was also observed between prosopis pollen and p. lunatus (lima bean) seed extract. A 66 kDa major allergen was purified from P. juliflora pollen and characterization as an important allergen for allergic disorders. The purified protein (66kDa) seems to contribute significantly towards allergenic cross-reactivity among tree pollen and food allergens tested. This cross-reactive protein can be exploited for clinical applications in diagnosis and therapy.

Contents

037. ANJALI PRIYADARSHANI

Effect of Noscapine on Mifeprsitone Induced Polycystic Ovary Syndrome in Wistar Rats.

Supervisor : Prof. Ramesh Chandra

Th 15620

Abstract

Preliminary complexation with ^{99m}Tc was found to give sufficiently stable complexes under physiological conditions. Although normal rats showed uptake of radiolabeled conjugate, elevated activity in ovary of PCOS induced rats confers a degree of target specificity. Indicates that noscapine accumulates more in hyper proliferating cells through yet unknown mechanisms (receptor or non receptor mediated). Reports direct lebeling of Noscapine. HCI with ^{99m}Tc with more than 98% purity. Gamma imaging and SPECT studies also supported the marked accumalation of noscapine in the ovaries of PCOS induced rats. The radiolabeled complex formed was proven for its stability in both saline and serum up to 24 hours. The blood kinetic data clearly indicate the biphasic elimination of ^{99m}Tc.noscapine HCI from blood with $t_{1/2}$ (S) ~ 3 h and 50 min and t1/2 (F) ~ 12 min circulation time. This account for high organ/blood ratio exhibited by ^{99m}Tc.noscapine.HCI. Noscapine, which is used for amelioration of PCOS, gets accumulated in hyperproliferating tissues such as ovary, apleen as documented by animal

distribution and scintigraphy data. The most immediate outcome of the present study will be the development of drug for the treatment of PCO, with potentialities to be carried forward for phase 1 clinical trials.

Contents

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

038. BATRA (Harish)
Study of Structure and Interaction of hSin3B, a Putative Transcription Corepressor, With Transcription Factor Mad1 and Transcription Corespressors.
Supervisor : Dr. Daman Saluja
Th 15821

Abstract

Defines and distinguishes the roles of mSin3A and mSin3B. Although hSin3A has been shown by computational analysis to be similar to Sin3A polypeptide and thus mostly has been presumed to interact and function in a manner analogous to mSin3A, human homolog of Sin3B (hSin3B).

Contents

1. Introduction. 2. Review of Literature. 3. Materials and methods. 4. Results. 5. Discussion. 6. Bibliography.

039. DOLLY KUMARI
Study on Food Allergens in Respiratory Allergy.
Supervisors : Dr. Susheela Sridhara, Dr. B. P. Singh and Dr. Raj Kumar
Th 15621

Abstract

Identifies of IgE mediated food allergy/allergens and association with bronchial asthma and allergic rhinitis patients. Analyses of IgE-binding proteins in common food allergens and cross-reactivity among different legumes. Purifises and partial characterization of a major allergenic protein from blackgram (Phaseolus mungo).

Contents

1. Review of Literature. 2. Identification of IgE mediated food allergy in bronchial asthama and rhinitis patients. 3. Identification of IgE-binding components of common food allergens & cross-reactivity. 4. Purification and partial characterization of a major allergen from blackgram (Phaseolus mungo). 5. Summary and Conclusions. 6. Bibliography. 7. Appendix.

040. GUPTA (Meetu)
Deciphering the Role of Serine and Threonine Kinases in Regulation of Cell Growth and Development of Mycobacterium Tuberculosis.
Supervisors : Dr. Vibha Tandon and Dr. Yogendra Singh
Th 15622

Abstract

Delineates the signaling mechanism of M. tuberculosis Ser/Thr kinases by identification of downstream substrates and the subsequent substrate characterization. A special attention was given to the STPK PknB, owing to its essential nature in M. tuberculosis.Rv0019c, a highly conserved gene in PknB cluster was shown to be phosphorylated by the kinase in vitro. Further, an 'essential' histone-like protein HupB was identified as the target of STPKs and was shown to be negatively regulated by phosphorylation.

Contents

1. Introduction. 2. Review of Literature. 3. Materials and methods. 4. Identification of FHA domain containing protein Rv0010c as a substrate of PknB and other serine and threonine kinases of M. tuberculosis. 5. Identification of the DNA binding domain of M. tuberculosis histone-like protein, HupB and its negative regulation by M. tuberculosis serine and threonine kinases. 6. Summary and Conclusion. 7. Appendices.

041. MANDAL (Manabendra)
Microbial Treatment of Biological Wastes and Generation of biofuels.
Supervisor : Dr. V. C. Kalia
Th 15664

Abstract

Isolated new H_2 Producers and use them to produce H_2 individually

and in consortia through computational method also potential H_2 producers are identified. The newly isolated microbial stains are use to produce H_2 from various waste materials. Used some new immobilization materials for methangens to improve production of CH_4 from biomass in continuous fermentation process. From different environment 35 H_2 producing bacterial strains have been isolated and characterized on the basis of their morphology, susceptibility against 12 antibiotics and H_2 production abilities.

Contents

1. Introduction. 2. Review of literature. 3. Materials and methods. 4. Results. 5. Discussion. 6. Summary and Conclusion. 7. References. 8. Appendices.

042. MATHUR (Rohit)
Experimental Studies on the Modification of Cellular Responses to Topoisomerase Inhibitors inNnormal and Transformed Cell Lines.
Supervisors : Prof. P. N. Kapoor and Dr. B. S. Dwarakanath
Th 15624

Abstract

Demonstrates that the pin 1 has a role in activation of topoIIa (enhancing the level of cleavable complex during treatment of etoposide) and also a functional interaction with p53. Therefore, alterations in either topoIIa-pin I or DNA damage response proteins like p53-pin I interaction can modulate the outcome of topo IIa poison based therapy. These studies suggest that strategies employing appropriate combination of pinI inhibitors with topo IIa poisons can effectively enhance the therapeutic efficacy of topo IIa poisons.

Contents

1. Introduction. 2. Scintific background. 3. Materials and methods. 4. Results and discussion. 5.General discussion. 6. Summary & Conclusion. 7. Bibliography.

043. MEHTA (Abhishek Kumar)
Epigenetic Analysis of Transgenic Mice With Triplet Repeats.
Supervisor : Prof. Vani Brahmchari
Th 15830

Abstract

Deals with the antagonising effects of C+G rich sequences and CTG repeats in transgenic mice and also the epigenetic factors that could be the basis of position effect influencing transgene expression.

Contents

044. NEETU
Biochemical Studies on Allergens of Epicoccum Purpurascens.
Supervisors : Dr. Susheela Sridhara and Dr. Naveen Arora
Th 15623

Abstract

Investigates the role of Epi p 1 protease in activating the allergic reaction. Identifies allergens of E. purpurascens by 2-D immunoblotting. Studies the role of Epicoccum proteins in host-fungal interaction and the effect of Epi p 1, a protease allergen in mice model of allergic airway inflammation. Purifies and characterizes a 12 kDa allegenic protein from Epicoccum.

Contents

045. PANDEY (Archana)
Molecular Analysis of Dynamic Mutation: A Study of (CCG) Repeat Instability in Transgenic Mice.
Supervisor : Prof. Vani Brahmachari
Th 15617

Abstract

Investigates the effect if any of telomeric sequences and microsatellite sequence on CGG repeat instability in transgenic

mouse model. The Transgenic mouse model generated simulates several features of the unstable CGG allele in human Fragile X patients, but not all. The study strongly suggests a major role for sequence context in mediating instability, an often postulated role that is being experimentally substantiated in recent literature. Transgene appears to function like a cassette for CGG repeats and the telomeric repeats probably suggests variation in mechanism. Failure to recover mice homozygous for the transgene in Tg18 line in contrast to the successful recovery of homozygous line in other lines is an interesting observation that requires further investigation. Identified the cis-elements sufficient for CGG repeat instability, sequence context necessary for instability remains to be deciphered.

Contents

1. Introduction. 2. Materials and methods. 3. Results and discussion. 4. References.

046. SHARMA (Vidhu)
Studies on Recombinant and Native Allergns.
Supervisors : Dr. Naveen Arora and Dr. B. P. Singh
Th 15616

Abstract

Gives comparative analysis and cross-reactivity studies of an allergen from C. lunata, epitope identification of Cur I 3 from C. lunata. Evaluates Cur I 3 and its peptides for allergen immunotherapy in murine model of airway hyper-reactivity.

Contents

1. Review of literature. 2. Native and recombinant cur I 3 C. lunata: comparative analysis and cross-reactivity. 3. Identification of Cur I 3 epitopes by bioinformatics & experimental analysis. 4. Cur I 3 and peptides for allergen immunotherapy in murine model. 5. Summary and conclusions. 6. Bibliography. 7. Appendix.

047. SHOKEEN (Poonam)
Antidiabetic and Antibacterial Properties of Some Medicinal Plants.
Supervisor : Dr. Vibha Tandon
Th 15619

Abstract

Bioassay guided fractionation of the hexane of leaves of O. sanctum gave six semipurified active fractions, H11, H12, H4, H25, H31 and H33. No activity was observed on further purification of H24 and H25 by column chromatography. similarly, further purification of H31h, the active subfraction of H31 and H33o, the active subfraction of H33 resulted in loss of activity probably because of the loss of synergistic effect upon purification. H11 was characterized as an isomer of eugenol. Purification of H12 led to the isolation of an active subfraction (H12c) which characterized using spectroscopic techniques and was found to be eugenol. MIC of H12c (eugenol) was determined on clinical isolated and WHO strains by using the agar dilution method. MIC of WHO strains ranged from 85ug/ml to 204ug/ml, whereas that of clinical isolates varied from 128ug/ml to S256ug/ml. To evaluate the safely of isolated eugenol, acute toxicity study was done by administering doses of eugenol (1 to 4g/kg b.wt. p.o.) to overnight fated rats. LD_{50} of eugenol was found to be 2gm/kg b. wt.

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