

Molecular characterization of IS407A-flIP genomic region of *Burkholderia mallei*

Chandan Prakash

Indian Veterinary Research Institute, India

Glanders is an infectious and highly contagious disease of solipeds with high zoonotic potential, caused by *Burkholderia mallei*, a Gram-negative, nonmotile, aerobic rod-shaped bacterium. Although this disease is not endemic but sporadic outbreak of this dreaded disease has been reported from various part of India. Rapid and accurate diagnosis is crucial for prevention and control of glanders. Present study aimed for molecular characterization of insertion sequence for developing molecular diagnostic test for rapid detection of *B.mallei* in natural glanders disease outbreaks.

Present study identified and characterized 3' end of insertion sequence in genome that is unique to *B.mallei* organism only and it can differentiate with other related organism. Briefly, Genomic DNA from *B.mallei* NCTC 3709 strain cultures was extracted using phenol: chloroform extraction method and Extracted DNA was quantified and checked for purity with spectrophotometer. The oligonucleotides primers were designed based on differences of flagellar P gene (fliP) from *B.mallei* ATCC 23344 (accession numbers NC_006348 and NC_006349) and *B. pseudomallei* K96243 (accession number NC_006350 and NC_006351). PCR reaction was optimized for amplification of IS407A-flIP genomic region which produced ~396bp amplicon. PCR product was purified and confirmed by restriction enzyme digestion with AluI enzyme. For nucleotide sequence determination, purified PCR product (396 bp) was ligated into pGEM-T Easy vector by T/A cloning strategy and transformed into *E. coli* DH5a competent cells using x-gal screening methods. Positives clones were confirmed by colony PCR and EcoRI restriction enzyme digestion of Plasmid DNA from positive clones released ~396bp amplicon. Released product was eluted from the agarose gel and once again checked by restriction enzyme digestion with AluI enzyme. Nucleotide sequence of positive clones were determined and submitted in NCBI (accession no. JQ335996). Insertion sequence IS407A showed complete agreement with other *B.mallei* strain while flIP gene showed variability among different *B.mallei* strain and other micro-organism. This study clearly underlines importance of this insertion sequence in developing molecular diagnostic test for diagnosis of glanders. Consensus presence of insertion sequence IS407A in all *B.mallei* strains without presence of even single nucleotide polymorphism offers a wide scope to develop insertion sequence based molecular diagnostic test for detection of glanders. These diagnostic tests may helpful in precise diagnosis in natural glanders outbreak.

Biography

Chandan Prakash has completed his graduation with chancellor gold medal in veterinary sciences (BVSc & AH) from CSA University of agriculture and technology, Kanpur, Uttar Pradesh, and acquired post graduation in Veterinary Bacteriology from Indian Veterinary Research Institute with ICAR Junior Research Fellowship. Presently, he is working as scientist in centre for animal disease research and diagnosis (CADRAD), IVRI, Izatnagar, Uttar Pradesh. He has published papers in reputed journals of national and international level.

chandanguptaivri@gmail.com

Natural products: A molecular target for cancer prevention and treatment

Shubhanker Dhari Singh, Anushree Chowdhury, Dipti Sinha and Vaibhav Sharma

School of Bio Sciences and Technology, VIT University, India

Cancer is the second leading cause of death worldwide. With few effective therapies cancer results in the death of a significant proportion of patients. As a result, the search for new treatments of cancer has rapidly gained momentum over the recent years. In particular, non-toxic "natural products" from natural resources in combination with conventional chemotherapeutic agents are proven useful in treatment of human malignancies with lower toxicity and higher efficacy. Recent data suggest that natural products like curcumin, tea, pomegranate, neem, extra-virgin olive oil, carrot, lemon, soybean, fish oil, tomato, garlic and amla can work as modifiers of signal transduction pathways to elicit their beneficial effects. These natural compounds are responsible for regulating cellular proliferation or apoptosis mainly by acting through nuclear factor-kappa B, mitogen-activated protein kinase signalling, Akt signalling pathway and several transcription factors, proteins, enzymes. This review will discuss recent research data focusing on these natural product-induced cellular signal transduction pathways. A clear understanding of the molecular mechanisms of action is crucial in the valuation of these potent molecules as potential prophylactic and therapeutic agents.

shubh_singh29@yahoo.co.in