

EXECUTIVE SUMMARY



During 2005-2006, Institute of Pathology took confident strides towards a number of scientific and academic achievements. Highlights project the ongoing scientific activities, achievements and new activities undertaken during this year.

Study on low penetrance genes associated with breast cancer risk in young women showed high incidence of T>C polymorphism in CYP17 gene in early onset cases which is involved in steroid biosynthesis pathways. This polymorphism created an additional site for synthesis of estrogen thereby leading to higher circulating estrogen in these patients. Study on vitamin D receptor gene, which has anti-proliferative role, did not show any significant association between Polymorphic VDR genotype (*Apa I and Taq I*) and breast cancer risk. Study of molecular characterization of early onset and familial breast cancer has shown that E-Cadherin gene acts as modifier of BRCA 2 gene in early onset cases of breast cancer. Study on cytokeratin expression and mismatch repair genes in these cases would delineate their role in morphogenesis and carcinogenesis .

Pre- and post-NACT quantitative analysis of expression of Type 1 growth receptor genes viz.: EGFR, C-erb2, C-erbB3 in locally advanced breast cancers is being done to evaluate their predictive role for response to treatment as well as their potential use as therapeutic targets. Efforts are also initiated to establish breast cancer cell lines to develop *in vitro* model for studies on tumorigenesis. In prostate cancer studies have been initiated on role of microsatellite CAG repeats in AR gene and defects in mismatch repair genes in initiation and progression. Investigations of host immunity in bladder cancer patients had shown existence of Th2 dominance in patients as compared to controls. Comparison of pre- and post-therapy circulating levels of Th1 and Th2 cytokines showed increase in Th1 cytokines in patients following therapy compared to pre-therapy levels. Multi-centric studies on oesophageal cancer and tobacco and pesticide associated cancers in North-East India have been started with aim to establish link between carcinogenic contents of tobacco and pesticides and genetic variation including polymorphism/ mutations and gene expression patterns in this region.

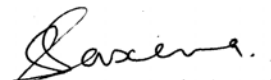
Determination of sensitivity and specificity of anti-chlamydial monoclonal antibody clones was done in addition to their characterization by western blot. Higher mRNA expression of γ IFN and IL-10 in cervical lavage cells of positive *C. trachomatis* patients suggest a mixed type of immune response. Chlamydial heat shock proteins *CHSP60* and *CHSP10* showed strong positivity in *Chlamydia trachomatis* positive patients compared to negative patients or patients positive for other sexually transmitted pathogens. Studies were also targeted for cloning and expression of inclusion proteins that interface with host factors for their role in

protection and pathogenic functions of *C. trachomatis*. Study on role of iron on persistence of chlamydial infection showed decrease in ROS levels during *Chlamydia* infection, which helps chlamydiae to persist. The prevalence of *Chlamydia trachomatis* positivity in endometrial curettings in spontaneous aborters was found to be 16.6%. Studies on cytokine expression in endometrial curettings to find out the immune response to *C. trachomatis* infection in spontaneous aborters is ongoing. Screening for *C. trachomatis* has also been started in coronary artery disease patients by nucleic acid amplification assay.

Microarray based studies undertaken to identify virulence related genes in *Leishmania* had shown transient increase in kinases and surface molecules PSA in intermediate stage PA24 with brief decrease in amino acid permeases. Attempts are also being made to identify novel targets to combat antimony drug resistance since a significant proportion (55%) of PKDL isolates were found antimony resistant from endemic area. Evaluation of immune response in Kala-azar and PKDL patients showed mixed Th1 and Th2 responses in PKDL lesions compared to Kala-azar. Message for IFN- γ , TNF- α and IL-6 were found significantly elevated in PKDL lesions compared to Kala-azar suggesting important role of these cytokines in PKDL. Molecular and immunological studies were also carried out for identification and characterization of species causing cutaneous leishmaniasis in Western Thar district of Rajasthan state that showed typical band pattern of *L. tropica* in DNA from both cultures and clinical samples. Molecular characterization of *Leishmania* parasite isolated from dermal lesions of PKDL is being done by Intergenic region typing of ribosomal internal transcribed spacer (ITS) to identify polymorphism.

Study to establish the utility of human placenta as a tool for comprehensive bio-monitoring for organic pollutants and establishing standard operating procedures (SOP) has shown presence of pesticide residues and pollutants like Cycloheptatrienylium bromide and Naphthalene in placental extracts.

Institute has set many milestones and achieved number of successes. It is a matter of pride that Dr. Aruna Mittal, Dy. Director (Sr. Gr.) has been conferred with Kshanika Oration Award of ICMR and the prestigious UNESCO L'Oreal Award and Fellowship for *Young Women in Life Sciences* was awarded to Mrs. Ruchi Singh. Scientists have managed to obtain large number of research projects from extramural sources and high quality publications in national and international journals of high impact factor. The academic activities continued with vigor and zeal.



Dr. Sunita Saxena
Director