

## **Dr. RM.PITCHAPPAN**

### **Emeritus Professor**

Regional Director, Genography Project  
Dept of Immunology  
Center for Excellence in Genomic Sciences  
School of Biological Sciences  
Madurai Kamaraj University, Madurai 625 021



### **RESEARCH AREAS**

1. Genomics & Immunogenetics of Tuberculosis susceptibility
2. Genome Scan in leprosy
3. HIV/AIDS, Immunogenetics & HIV vaccine trial
4. MHC, Migration & Human Genomics

### **HONORS AND AWARDS**

1. Fellow of Academy of Medical Science (FAMS)
2. Fellow of Academy of Science (FASc)
3. H.M. Bhatia Oration Award IIH-ICMR, 2002

### **CONTACT DETAILS:**

Email: pitchappanrm@yahoo.co.uk  
Phone: 0452-2458269

### **RESEARCH INTERESTS**

1. Genomics & Immunogenetics of Tuberculosis susceptibility
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(1) HLA-DR2 association with pulmonary tuberculosis and the importance of BCG vaccination status at the level of TCR v $\beta$  usage explained (Tubercle & Lung Diseases-94:309-17). HLA non-DR2 people, not vaccinated with BCG during childhood express IL-10 and are at greater risk of developing the disease (Infect. & Immuno.69:5635-42). A spectrum of immune reactivity at the immunological and cytokine level exists reiterating the importance of host genetics in disease susceptibility. The study is extended at the genomic level, to identify the differences in global expression employing microarray technology.

(2) Human genome scan employing microsatellite markers and SNPs are undertaken in south Indian affected sib-pair families, in collaboration with University of Oxford, The Wellcome Trust Centre for Human genetics. Two major loci for leprosy susceptibility, in c10p13 and c20 have been identified (2001, Nature Genetics 27:439-41, J.Infect. Disease. 186:1190-3), the second marker being unique to Tamil Nadu. Studies on MHC brought out HLA DR2 and MicA association with the disease. The study is extended to another 10 regions mapped in the initial whole genome screen.

(3) The terminal disease in HIV/AIDS in India is tuberculosis. There is a rural urban divide with greater concomitant disease in urban setting. HLA determines the susceptibility to the disease and long-term non-progression. Studies are underway to develop well-defined cohorts, for vaccine trials in India. The host and parasite genomic diversity in disease susceptibility and progression is to be studied.

(4) Mankind originating in Africa migrated along the coastal route to Australia through India: we obtained evidence using NRY markers (Proc.Natl.Acad.Sci.USA.98:10244-9): made into a documentary by National Geographic Channel 2002 Dec. South Indian caste groups, a result of the grandest experiment of nature (Dobzhansky, 1973) have shown an enormous HLA allelic diversity. Many new alleles have been identified in them. The differences are due to migration of various populations to this land during different time points of prehistory: still we obtain evidence of selection operating on these populations. A dedicated computer database and analysis programmes for Human Immunogenetic Studies have been developed. A large scale, multi centric study to explore the Genomic diversity of 'Dravidian population' is under way.

## PUBLICATIONS:

1. **RM. Pitchappan**, V.J. Kavitha and **M. Jayalakshmi** (2008) HLA Genomic Diversity of India and its implications in HIV Pandemic. Int. J. Hum. Genet. 8: 143-153.
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4. Vani, S. and **Pitchappan, RM.** (2006) Host Genetics and Infectious Diseases in South India. Int. J. Hum. Genet. 6: 41-48.
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9. Shankarkumar, U., Sridharan, B., **Pitchappan, RM.** (2003) HLA diversity among Nadars, a primitive Dravidian Caste of South India. Tissue Antigens 62: 542-7.
10. Shanmugalakshmi, S., Dheenadhayalan, V., Muthuveeralakshmi, P., Arivarigan, G. and **Pitchappan, RM.** 2003. *Mycobacterium bovis* BCG scar status and HLA class II alleles influence Purified Protein Derivative-specific T-cell receptor vB

expression in pulmonary tuberculosis patients from southern India. *Infection & Immunity* 71(8):4544-53 .

11. Shanmugalakshmi, S., Balakrishnan, K., Manoharan, K., and **Pitchappan, RM.** (2003) HLA-DRB1, -DQB1 in Piramalai Kallars and Yadhavas, two Dravidian speaking castes of Tamil Nadu, south India. *Tissue Antigens* 61:451-464.
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13. Shanmugalakshmi, S., Balakrishnan, K., Manoharan, K., and Pitchappan, RM. 2003. HLA-DRB1\*, -DQB1\* in Piramalai Kallars and Yadhavas, two Dravidian speaking castes of Tamil Nadu, south India. *Tissue Antigens* 61:451-464.
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