Influence of Intron II Microsatellite Polymorphism in Human Toll-like Receptor 2 Gene in Leprosy

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Introduction

Leprosy – Infectious Disease – *M. leprae*
Intro....

- **TOLL LIKE RECEPTORS (TLRs)-10** Pattern Recognition Receptors.

- **TLR2** - essential in the recognition of microbial lipopeptides.

- **duration of activation and expression** is critical in outcome of leprosy infection.

- **IFN-γ** pro-inflammatory cytokine.

- **IL-10** plays a dual role inducing protection/susceptibility.
Objective

To identify the influence Intron II GT microsatellite polymorphism on expression of $TLR2$ in Leprosy
Materials

❖ For Genotyping

Leprosy Patients n=88
House hold Contacts n=95
Healthy Controls n=96

❖ For Cell Culture Stimulation

Leprosy Patients n=6
Healthy Controls n=7
Methodology

• Microsatellite screening by PCR-sequencing

• Cell culture and stimulation with MLSA(M.leprae Soluble antigen)

• mRNA expression by RT-PCR

• ELISA for Cytokine profiling (Immune Response)

• MPM(Micro Plate Manager), Open epi & Graph pad Prism 6 software for data analysis
Results

**Figure 1.** Distribution of GT repeats in Leprosy patients, HHC and HC groups with GT repeat number on x-axis and its corresponding number of individuals on y-axis
Results

**Figure 2.** Relative TLR2 mRNA expression (a) with respect to longer (L) and shorter (S) allele irrespective of study groups (b) with respect to alleles in healthy controls and Leprosy patients

Horizontal line and error bars denote Mean ± SEM, * significant (p <0.05), (Unpaired t-test)
Results

**Figure 3** (a) IL-10 levels in leprosy patients and healthy controls with shorter (S) and longer (L) alleles

![IL-10 Levels Graph](image)

**Figure 3** (b) IFN-γ levels in leprosy patients and healthy controls with shorter (S) and longer (L) alleles

![IFN-γ Levels Graph](image)

PAT - Leprosy Patients, HC - Healthy Controls, * significant (p <0.05), Horizontal line and error bars denote Mean ± SEM MLSA- *M.leprae* Soluble Antigen, UNS- Un-stimulated. (Unpaired t-test)
Observations

• Allele/genotype with **longer GT (20-24)** - susceptibility

  • Longer GT repeats $\downarrow$ TLR2 mRNA $\uparrow$ IL-10

• Allele/genotype with **shorter GT (12-15)** - resistance

  • Shorter GT repeats $\uparrow$ TLR2 mRNA $\downarrow$ IL-10
Conclusions

• High IL-10 producing allele of TLR2 microsatellite might predispose an individual to leprosy

• House Hold Contacts (HHCs) with longer GT repeats might be at risk for developing leprosy
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