

**TOPICAL ANTIGLAUCOMA DRUGS: BETA 2 AND
PROSTANOID (FP) RECEPTORS POLYMORPHISMS AND
THEIR IMPLICATIONS**



Postgraduate student : Mohd Nizam bin Zahary
Research Officer : Hoh Boon Peng
Main Supervisor : Dr. Zilfalil Alwi
Co-Supervisor : Dr. Liza Sharmini Ahmad Tajudin (Ophthal. Dept., USM)
Co-Researchers : Prof. Rusli Ismail (INFORMM, USM), Dr. Zunaina Embong (Ophthal. Dept., USM), Dr. Teh Lay Kek (UITM, Shah Alam), Dr. Zulkifli Abd. Ghani (Hosp. Kota Bharu), Dr. Lin Naing @ Ayub Mohd Sadiq (PPSG, USM)

Track Record :

- The effects of topical antiglaucoma drugs on conjunctival cell profile.
- Characteristic ocular finding in Kelantanese children with Down syndrome.
- USMEIR: Universiti Sains Malaysia Eye Injury Registry.

Research Center : Human Genome Centre, School of Medical Science, Universiti Sains Malaysia.

Current Status of Project : Ongoing

Introduction :

Glaucoma is defined as a progressive optic neuropathy involving characteristic structural damage to the optic nerve and resulted in specific visual field defects. Glaucoma is believed to have a genetic predisposition. Beta 2 receptor and prostanoid (FP) receptor is encoded by beta-2 receptor gene and PGF2 α gene respectively. No studies on the association of beta-2 polymorphisms and glaucoma patients have been done before. There was no study have been documented to associate the mutation or polymorphism of PGF2-alpha gene and glaucoma.

Objectives :

- To identify the type and frequencies of prostanoid (FP) receptor polymorphisms in Malaysian population.
- To identify the type and frequencies of beta-2 receptor polymorphisms in our population.
- To determine the effectiveness of topical timolol and latanoprost and their relationship to the beta-2 receptor polymorphisms and prostanoid receptor polymorphisms respectively.
- To correlate beta-2 receptor polymorphisms to the side effect of topical timolol and latanoprost in glaucoma patients.

Technical Methodology :

Genomic DNA was extracted from blood using commercial kit (QIAGEN QIAamp DNA Blood Mini kit). Five polymorphisms of the beta-2 receptor gene was simultaneously amplified from genomic DNA using single-tube allele specific multiplex PCR followed by gel electrophoresis. Selected amplicons were sequenced to confirm the presence of 5 alleles. For PGF2 α gene, primers were designed and PCR was performed to amplify the gene. Mutation or polymorphism in this gene was screened by dHPLC and DNA sequencing will be performed to confirm the result.

Expected Outcome :

- Development of a method for screening of mutations or polymorphisms in beta-2 receptor gene and PGF2 α gene.
- Better characterization of PGF2 α gene among Malaysian population.
- Understanding the pattern of ocular hypotensive effect of topical timolol and topical latanoprost among Malaysians.
- Understanding the drug responses of Timolol and Latanoprost in glaucomatous Malaysian population.