

# 4<sup>th</sup> International Conference on Clinical & Experimental Ophthalmology

July 14-16, 2014 DoubleTree by Hilton Baltimore-BWI Airport, USA

## Mixed nanomicelles of dexamethasone- A new topical therapy for Posterior uveitis

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The present study deals with the development and characterization of a mixed nanomicellar eye drop formulation of dexamethasone (DEXSOLV) and effectively deliver the drug to the retina following topical administration for the treatment of posterior uveitis. Mixed nanomicelles were formulated using nonionic surfactant molecules polysorbate 80 (P80) and polyoxyl 40 stearate (P40S). Nanomicelles were characterized for size, zeta potential, morphology, clarity, surface tension, and dilution stability in artificial tears. Ocular tolerance and tissue distribution of dexamethasone were studied following single and repeated topical administrations of DEXSOLV in rabbits. The nanomicellar formulation of dexamethasone (0.1%) with an optimized composition of P40S/P80 = 7/3 by weight was clear with a particle size of about 14.5nm. The absorbance of DEXSOLV was found to be less than 0.1 at 400nm. Transmission electron microscopy images revealed the spherical structure of micelles. DEXSOLV was found to be stable at 4°C and 25°C for up to 6 months. No irritation or redness was observed in the treated eyes as compared to the untreated control rabbit eyes. Therapeutic concentrations of dexamethasone were observed in various anterior and posterior segment tissues, including retina-choroid, suggesting the effectiveness of topical therapy in posterior uveitis. In conclusion, the nanomicelles of P40S and P80 could efficiently solubilize dexamethasone, a lipophilic drug, in their cores resulting in a stable aqueous eye drop formulation. Using this eye drop formulation, dexamethasone concentrations could be maintained well above the minimum effective concentrations following topical administration.

### Biography

Sai HS. Boddu is an Assistant Professor at The University of Toledo, College of Pharmacy and Pharmaceutical Sciences. He received his Ph.D. in Pharmaceutical Sciences from The University of Missouri-Kansas City (UMKC) in Dec, 2010. He has also received a Bachelor of Pharmaceutical Sciences degree (B. Pharmacy) along with the professional pharmacist licensure and Master's in Pharmaceutics from India. Dr. Boddu's research areas include Drug Delivery, Bioanalysis, and Pharmacokinetics. He authored and co-authored more than 25 research and review articles in various peer reviewed journals. He also made significant contribution in 6 book chapters.

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