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Molecular Imprinted Polymers as Synthetic Receptors for the Analysis of Testosterone

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Abstract — Testosterone imprinted co-polymer membranes of acrylonitrile with acrylic acid, methacrylic acid and acrylamide were synthesised by phase inversion technique. The developed membranes were characterised by FT-IR, XRD and SEM techniques. Imprinted membranes showed specificity towards the template testosterone. Among the various co-polymers, the acrylamide incorporated co-polymer showed high binding towards the used template. Investigation of the selectivity characteristics revealed that the developed membranes showed selectivity toward the template testosterone than similar compounds. The bound template could be totally recovered and regenerated membranes maintain their recognition property after repeated use. On the basis of the results, the imprinted membranes can be applied for the direct extraction of testosterone in clinical analysis.

Keywords : *Molecular imprinting, acrylic copolymers, membranes, testosterone, binding capacity, urine analysis.*

INTRODUCTION

Testosterone (TSN) is a steroid hormone from the androgen group and is found in mammals, reptiles, birds, and other vertebrates. In mammals, testosterone is primarily secreted in the testicles of males and the ovaries of females, although small amounts are also secreted by the adrenal glands. It is the principal male sex hormone and an anabolic steroid [1]. Tainted by a history of abuse by body builders and athletes, testosterone is often pointed as the cause of aggression, bulging pectorals, an insatiable sexual appetite and the almighty hairy chest [2]. Its reputation has been somewhat

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