The present investigation reports design of a new pH responsive polymeric material from shellac for pharmaceutical applications. The material was prepared from the combination of shellac and glycine. Acrylic acid was used to incorporate pH responsive characteristics in the material. The material was characterized using Fourier transform infrared spectroscopy, thermogravimetric analysis and scanning electron micrograph techniques. The thermal stability and the kinetics of material decomposition were evaluated using various mathematical models. The kinetics of controlled release of 5-amino salicylic acid was studied in buffer medium using Fick’s model equation.

**Keywords:** Shellac, Glycine, pH responsive, Controlled release, 5-Amino salicylic acid.
QSAR Analysis of 7-Chloro-4-Aminoquinoline Derivatives as Antimalarial Agents

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Quantitative structure activity relationship (QSAR) studies were performed on a series of 7-chloro-4-aminoquinoline derivatives with aim to evaluate the influence of steric (MR), hydrophobic (log P) and electronic (DM) factors on their antimalarial activity. A multiple linear regression analysis (MLR) was carried out to obtain QSAR model(s) in order to make quantitative assessment of relationships between above molecular descriptors and antimalarial activity of 4-amino-quinoline derivatives. QSAR models were found statistically significant which, therefore, may be useful for the prediction of activity of some newer structural analogues based upon the structural scaffold of 7-chloro-4-aminoquinoline for the rational design and development of potent antimalarial leads.

Keywords: QSAR, Multiple linear regression analysis, Molecular descriptors, 7-Chloro-4-aminoquinoline, Antimalarial.
Immunostimulant Fractions of Novel Hexa and Heptasaccharide from Donkey's Milk

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The proposed oligosaccharide mixture of Donkey’s milk has shown significant stimulation of antibody, delayed type hypersensitivity response to sheep red blood cells in BALB/c mice. The orally treated animals showed a six time increase in haemagglutinating antibody (HA) titre, two times increase in haemolytic plaque-forming cells (PFC) and delayed type hypersensitivity (DTH) response. The non-specific immune response of treated animals also showed a two times increase in macrophage migration index (MMI). Two novel oligo-saccharides have been isolated from this oligosaccharide mixture obtained from donkey’s milk having immunostimulant activity. These compounds were isolated by a combination of gel filtration chromatography, silica gel column chromatography of derivatized oligo-saccharides while their homogeneity was confirmed by HPLC. The structures of these isolated oligosaccharides were elucidated on the basis of NMR spectroscopy, mass spectrometry and also with help of Structure reporter groups.

Keywords: Oligosaccharide, Immunostimulant, Donkey milk, Equinose, Asinose.
Polyethylene Glycol (PEG-400) as an Efficient and Recyclable Reaction Medium for Four-Component Coupling One-Pot Synthesis of Functionalized Pyrroles under Catalyst-free Conditions

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Polyethylene glycol (PEG) was found to be an effective and non-toxic reaction medium for the one-pot synthesis of functionalized pyrroles under catalyst-free conditions in excellent yields. Environmental acceptability, low cost, high yields and recyclability of the PEG are the important features of this protocol.

Keywords: Functionalized pyrroles, 1,3-Dicarbonyl compounds, Amines, Aromatic aldehydes and Nitroalkanes, Polyethylene glycol, Catalyst-free conditions.
Catalytic Efficiency of Phosphated Zirconia in Selected Organic Reactions

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The efficiency of phosphated zirconia as a catalyst for the selected organic reactions in the liquid phase was investigated in a self-modified batch type glass reactor. The PO₄³⁻/ZrO₂ samples were prepared by treating zirconia with H₃PO₄ solution (0.5 M) followed by calcination at 523, 773 and 973 K. The prepared catalyst samples were characterized by XRD, SEM, EDX, BET surface area and pore size analyzer. The catalyst samples showed excellent catalytic activity for reactions such as ring-opening of epoxide with aniline, Aza-Michael addition reaction and Knoevenagel condensation reaction, at mild reaction conditions.

Keywords: Phosphated zirconia, Liquid phase, Organic reactions.