Chapter 8
Predicting ATP-Binding Cassette Transporters Using Rough Set and Random Forest Model

Rudra Kalyan Nayak
https://orcid.org/0000-0003-4447-8391
VIT Bhopal University, India

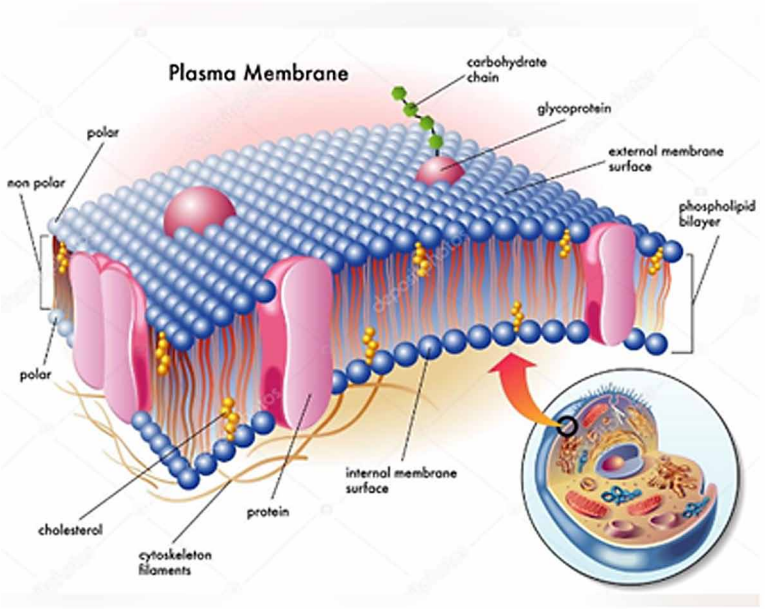
Ramamani Tripathy
Chitkara University, India

ABSTRACT

In reality, all homosapiens species benefit greatly from the function of ATP-binding cassette (ABC) transporter proteins. Many studies have focused specifically on the drug transporter prediction because to the recent advancements in biology. Machine learning and soft computing with data mining methodologies have been used to identify valid motif sequences from biological datasets in general. In this work, the authors analysed the research on the ABC transporter with the prediction of cellular cholesterol. This research is focused on this new area, as ABC transporters are frequently employed as pharmacological targets. In this instance, the authors have focused on the ABC transporter's legitimate signature motif involving plasma membrane cholesterol. The authors used an unique hybrid model that is rough set with random forest for the prediction of motif structure that has clinical significance for predicting relevant motif sequences.

DOI: 10.4018/978-1-6684-6523-3.ch008

Figure 1. Structural components of Plasma membrane



INTRODUCTION

Plasma Membrane

The membrane (Chauhan, 2003) that divides the interior of the cell from the external environment is found in all cells and is referred to as the plasma membrane or cell membrane. A cell wall is affixed to the plasma membrane on the exterior of bacterial and plant cells. A semi-permeable lipid bilayer makes up the plasma membrane. The movement of materials into and out of the cell is controlled by the plasma membrane (Oram, 2002).

Every living thing, including prokaryotic and eukaryotic organisms (Paila et al., 2010), has a plasma membrane that encloses its internal contents and acts as a semi-porous barrier to the outer world. The membrane serves as a barrier, keeping the components of the cell together and preventing the entry of outside chemicals. However, the plasma membrane is permeable to particular molecules, enabling the entry of nutrients and other vital components as well as the exit of waste products from the cell. Small molecules can move freely over the membrane, including oxygen, carbon dioxide, and water, but the movement of bigger molecules, such amino acids and carbohydrates, is strictly controlled.

Artificial Immune System in the Management of Complex Small Scale Cogeneration Systems

Fabio Freschiand Maurizio Repetto (2009). *Handbook of Research on Artificial Immune Systems and Natural Computing: Applying Complex Adaptive Technologies (pp. 141-158).*

www.irma-international.org/chapter/artificial-immune-system-management-complex/19643