UNIVERSITI TEKNOLOGI MARA

SEQUENCE ANALYSIS AND HOMOLOGY MODELING OF MOUSE TRPCl, TRPC4 & TRPC5 CHANNELS

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TABLE OF CONTENTS

ABSTRACT

Transient receptor potential (TRP) channels are involved in the perception of a wide range of physical and chemical stimuli, including temperature and osmolarity changes, light, pain, touch, taste and pheromones, and in the initiation of cellular responses there upon. Knowing the structure of these importantly discover receptor proteins are crucial since these proteins also responsible for many diseases such as breast cancer, prostate cancer and cardiovascular disease. The absence of the three dimensional structure of the transient receptor potential channels (TRPCs) drove us to construct the homology modeling based on its similarity with one protein of the known structure as template protein. This prediction method would allow users to rapidly use generated *in silico* protein models in all the contexts where today only experimental structures provide a solid basis: structure-based drug design, analysis of protein function, interactions, antigenic behavior, and rational design of proteins with increased stability or novel functions. Furthermore, protein modeling is the only way to obtain structural information if experimental techniques fail. Many proteins are simply too large for NMR analysis and cannot be crystallized for X-ray diffraction, where homology modeling can overcome this limitation. The model generated can then be used for further research in determining the exact properties and function of TRPC1, TRPC4 and TRPC5.