

# Identification of the gene encoding Brain Cell Membrane Protein 1 (BCMP1), a putative four-transmembrane protein distantly related to the Peripheral Myelin Protein 22 / Epithelial Membrane Proteins and the Claudins

## ABSTRACT

A gene encoding a putative four-transmembrane protein, BCMP1, has been detected in multiple mammalian species, which is regarded as supplementary information within this family. The gene is abundant in dog brain cells and is believed to cause X-linked mental retardation due to its chromosomal localization in humans.

## INTRODUCTION

A recent review of the literature on the role of the Epithelial Membrane Proteins in the regulation of brain function, revealed that the Epithelial Membrane Proteins are essential for the control of the function of the nerve cells in the brain. The Epithelial Membrane Proteins are present in both the brain and the heart, but the brain is more abundant in the heart. The Epithelial Membrane Proteins are also present in the brain and brain tissue, and are particularly abundant in the brain and brain tissue.

The Epithelial Membrane Protein By using a screening process, we were able to identify and select sequences of proteins that are targeted to the cell nucleus. Our approach involves transfected cells that contain transformed EGFP-encoded fusion proteins stored in the nucleus. However, only one of the three cDNA sets was translated into the corresponding sequence from the original library, and this was not predicted to occur frequently enough to generate functional nuclear localization sequence at random. "C60" was cloned using an approach that revealed significant DNA sequence similarity to a mouse EST sequence in the EMBL/GenBank database. Although no open reading frame (ORF) had been identified yet, our dog and mouse sequences both displayed distinct differences, with the former containing mainly at the third position of base triplets in place of the ATG codon. As despite this, the translated cDNA from the mouse into the construct produced 201aa-long, which we cannot determine whether the latter indicating

## CONCLUSION

Remarkable conclusions We have identified and described a novel protein, Brain Cell Membrane Protein 1 (BCMP1), that is highly expressed in the brain. The gene is conserved on chromosome X in mammals while being closely related to the DMD locus in humans, rats, and dogs. Although it shares similarities with PMP22/EMPs and claudins, it has distinct characteristics, including exhibiting an expected intracellular amino-terminal extension, which sets it apart from other known members of the family. IMPAS (Portuguese membranes) or PMP22/EMPs are integral membrane proteins that appear to be involved in many cellular functions, including regulating cell division and proliferation, as well as apoptosis and the assembly of peripheral nerve myelin. The claudins, which are also localized at tight junctions within the cell, constitute another integral protein that can exhibit calcium-independent cell-adhesion activity. The PMP22 gene's mutations are responsible for hereditary motor and sensory neuropathies in human and rodents, as well as Charcot-Marie-Tooth type 1A (CMT1A) disease and Trembler (Tr) mouse. Furthermore, the gene encoding claudin-14 was found to be present in individuals presenting

nonsyndromic recessive deafness DFNB29, while the TM4SF2 gene is located near the BCMP1 gene of the same mechanism.