Calcium-mediated transductive systems and functionally active gap junctions in astrocyte-like GL15 cells

ABSTRACT

Ultimately, findings of this study support the use of the GL15 cell line as an in vitro astrocyte model for studying physiological features of glial cells at different stages of differentiation.

INTRODUCTION

Olfactory activity in mammals is a crucial neurosensory function that involves analyzing the external chemical environment. The initial step in detecting scents is the interaction of an odorant molecule with olfactorying receptors (ORs) located at the surface of cilia of certain chemosensoricial OLSEN in the underlying ear cartilage and other mellow sensory neurons. The largest family of vertebrate genes, identified in 1991 as seven-transmembrane ORs, contains up to 1,000 genes (reviewed in) Mammalian OR is a class of G-protein-coupled receptors belonging to Class I or A, including opsins and catecholamine receptor. Each olfactory neuron appears to express essentially one type of OR gene selection, suggesting that there may be more complex mechanisms than other types. Olfactory behavior is exemplified by the ability of olfaction to recognize odorants through combinatorial means. Each receptor recognizes different odeurs, and each scented molecule binds to several receptors in order to generate unique activation patterns for many different smells. The genes encoding ORs do not contain any introns within their coding regions. Oral OR genes in mammals are usually found in groups of ten or more members and located on multiple chromosomes. The majority of human OR (hOR) genes have a repertoire that includes numerous pseudogenes, which suggests that olfaction played fewer roles in the evolution of primates. Recent research indicates that approximately 70% of all hOR genes may be pseudogenes, while less than 5% of HBORs occur in rodents or lower primates. There are currently approximately 150 full-length receptor genes found in incomplete compilations of human HHOR gene sets, with annotated sets available online. The recent milestone in publishing the first draft of the human genome sequence by two groups opens up the possibility of comprehensive identification, mapping, and analysis of OR genes and their products in the near future. According to one of these groups, the total number of Oregon ORs (906) is estimated to be around 60% pseudogenes. In recent times, several labs have suggested various alternative names for hORs, such as a comprehensive phylogenetic classification established at the Weizmann Institute. The identification, cloning, and sequence-based classification and analysis of candidate HSMRs are crucial for rational structure-function studies of this extensive receptor family. Our objective was "to identify (amongst other) full-length receptors for a set of hOR genes", and the approach was to perform repeating homology-based searches of GenBank DNA, particularly available unannotated raw sequences, as well as compiling already existing public databases. Here we report the cloning and identification of 347 putative full-length hOR receptor genes, which we believe represent nearly all possible but not fully understood repertoires of functional HORs, as well as a comparative sequence sequence analysis of the predicted OR gene products and propose renaming conventions for candidate OHORs.

CONCLUSION

Findings These studies suggest that PP5 plays a role in regulating GR nucleocytoplasmic shuttling and that the nuclear accumulation of GG is caused by suppressing DP5 expression without any hormone-mediated response. Hence, the previously reported increase in GR-induced transcriptional activity following ISIS 15534 induced suppression of PP5 expression may be due to the nuclear accumulation of highly bound gre (a type of genetic material) that is capable of binding DNA, but still requires agonist interaction to induce maximum transcriptionally active synthesis. The specific manner in which PP5 hinders the nuclear accumulation of GRs is still unknown, as it remains unclear whether it acts to prevent the nucleus from being expelled.