

Differential expression of Aquaporin 8 in human colonic epithelial cells and colorectal tumors

ABSTRACT

Our result suggests that the expression of AQP8 is a marker of normal proliferating colonic epithelial cells and suggest these cells to be involved in fluid transport in the colon.

INTRODUCTION

Background Many genes are known to be involved in colorectal carcinogenesis. Colorectal cancer is sometimes inherited in familial syndromes like Familial Adenomatous Polyposis (FAP) or Hereditary Nonpolyposis Colorectal Cancer (HNPCC). The identification of the predisposing genes in inherited tumors have meant great contribution to our understanding of colorectal carcinogenesis in these families but also of carcinogenesis in general. The majority of colorectal tumors, however, are sporadic, and studies in sporadic tumors have revealed other genes of importance in colorectal tumor development, e.g. K-Ras, TGF β , E-cadherin, SRC and the PPAR γ . Genes may be altered in tumors compared to normal tissue without necessarily being causative. Tumor cells often de-differentiate or have their origin in immature cell types and loose expression of proteins associated with highly differentiated cells, and could in stead gain expression of embryonic proteins. These alterations can potentially be used as clinical markers to define a particular disease entity, useful for diagnosis, staging, population screening or even to detect the presence of occult metastatic disease, recurrent disease and response to treatment. The perhaps most known embryonic protein used as a tumor marker in malignancy is the CEA in colorectal cancer. In an attempt to identify additional genes altered during the development of colorectal cancer, we compared the gene expression pattern between normal colon epithelium samples and colorectal tumors using the mRNA differential display PCR (mRNA DD-PCR) method. In this paper we report that the water channel protein AQP8 is expressed in the normal columnar epithelial cells of the colonic mucosa facing lumen and that adenomas and colorectal cancer do not seem to express this protein.

CONCLUSION

Our finding of AQP8 expression in human columnar surface epithelial cells, suggests these cells to be involved in water resorption in human colon. Since mRNA-in situ hybridization showed a positive signal for mRNA expression of AQP8 in the normal columnar surface epithelial cells and no signal from the cells in the crypt (Fig. 3), this indicates that the expression of AQP8 is a marker only of fully differentiated surface colonic epithelial cells.