Distribution of aquaporins in the colon of Octodon degus, a South American desert rodent

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Octodon degus is a desert rodent of northern Chile, adapted to survive with a limited supply of water. This rodent has a high degree of fecal dehydration, related to colon water absorption. With the hypothesis that aquaporins (AQPs) might be present in the colon epithelium of O. degus and involved in fluid absorption, we studied colon water absorption in vivo and the distribution of AQPs and Na+ transporters by immunocytochemistry. AQP-1 was found in apical and basolateral membranes of surface-absorptive and crypt epithelial cells. AQP-8 was found in the cytoplasm of enterocytes of surface colon. AQP-3 immunolabeling, on the other hand, was absent from the epithelium but present in a subepithelial fibroblast layer, pericryptal cells, and muscularis mucosae. The hydration state did not modify the amount of immunostaining for any of the AQPs. Colon water absorption was markedly decreased by the mercurial agent p-chloromercuribenzenesulfonic acid and was not affected by water deprivation.