# STRUCTURAL AND FUNCTIONAL ANALYSIS OF WATER CHANNEL

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Water channels are now called aquaporins (AQPs) and widely distributed in mammalian tissues. AQPs belong to the major intrinsic protein (MIP) superfamily, and there is functional difference among MIP proteins. For example, AQP1 and AQP2 are water-selective and exclude solutes; AQP3 is permeable to water, glycerol, and urea; AQP-CE1 (the first water channel which we identified in the nematode *Caenorhabditis elegans*) is permeable to water and urea, but exclude glycerol; glycerol facilitator (GlpF) is glycerol-selective and excludes water and urea. It has been speculated that the MIP family may be separated into two large subfamilies based on the presence or absence of two segments of extra amino acid residues (~15 amino acid) at the second and third extracellular loops. Because AQP3, AQP-CE1, and GlpF all have these two segments, we replaced the segments of AQP-CE1 with those of AQP3 and GlpF to identify their roles. The functional characteristics of these mutants were principally similar to that of wild-type AQP-CE1, although the values of Pf and urea permeability were decreased by 39~74% and 28~65%, respectively. In summary, the two segments of extra amino acid residues at the second and third extracellular loops may not contribute to the channel selectivity or the formation of the route for small solutes.