

Aquaporins – expression, purification and characterization

Content

Aquaporin water channels facilitate the bi-directional flow of water and small, neutral solutes down an osmotic gradient in all kingdoms of life. Over the last two decades, the availability of high-quality protein has underpinned progress in the structural and functional characterization of these water channels. In particular, recombinant protein technology has guaranteed the supply of aquaporin samples that were of sufficient quality and quantity for further study. Here we review the features of successful expression, purification and characterization strategies that have underpinned these successes and that will drive further breakthroughs in the field. Summarizing the production processes which has resulted in high resolution aquaporin structures reveals that *Escherichia coli* is a suitable host for prokaryotic isoforms, while *Pichia pastoris* is the most commonly used recombinant host for eukaryotic variants. Generally, a two-step purification procedure is applied after solubilization in glucopyranosides and most structures are determined by X-ray following crystallization.

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