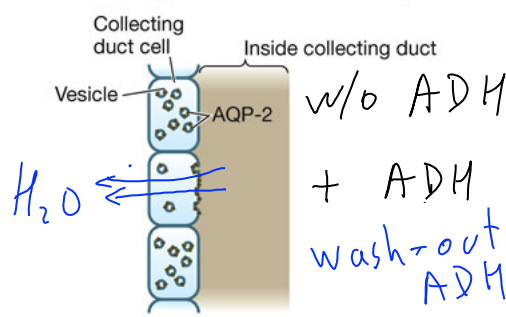


INVESTIGATING LIFE

HYPOTHESIS Antidiuretic hormone (ADH) controls the location of aquaporin proteins.

METHOD

1. Isolate collecting ducts from rat kidney.
2. Use immunochemical staining to localize the AQP-2 aquaporins in collecting duct cells both with and without the presence of ADH. Also localize the aquaporins after ADH is applied and then washed away.
3. Perfuse collecting ducts and measure water permeability under the same three conditions.



Collecting duct cell Inside collecting duct

Vesicle AQP-2 w/o ADH + ADH wash-out ADH

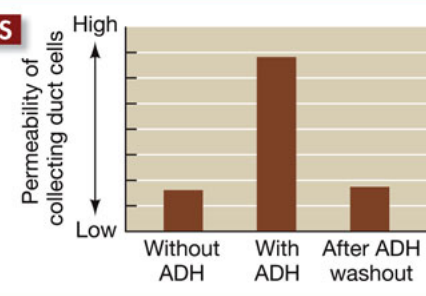
H_2O \rightleftharpoons

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LIFE 9e, Figure 52.17 (Part 1)

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RESULTS



Condition	Permeability of collecting duct cells
Without ADH	Low
With ADH	High
After ADH washout	Low

CONCLUSION In the absence of ADH, AQP-2 is sequestered intracellularly. When ADH is present, these water channels are inserted into the plasma membranes, making the cells more permeable to water.

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LIFE 9e, Figure 52.17 (Part 2)