The effect of calcimimetics on hypo-osmotic volume regulation in bivalves.

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Exposure of the tissues of osmoconforming molluscs to a decrease in the osmotic concentration of the ambient medium results in an osmotic gain of water. To regulate cellular volume, the cells release amino acids (AA) to bring the cytoplasm into osmotic equilibrium with the extracellular fluid. The mechanisms involved in the control of the release of AA are unknown. Calcium-sensing receptor proteins (CaR) control the secretion of parathyroid hormone (PTH); a decrease in the ambient concentration of Ca^{++} stimulates PTH secretion. Calcimimetics are prescription drugs that are agonists for CaR. To investigate the role of CaR in volume regulation, ventricles of *Crassostrea virginica* acclimated to 1000 mOsm seawater (SW) were exposed to either 500 mOsm SW or 500 mOsm SW containing 1 mg/ml of the calcimimetic Sensipar®. Ventricles in 500 mOsm SW released 4.7 ± 3.0 μmol/g dry wt AA; ventricles in 500 mOsm SW + Sensipar released 17.7 ± 2.8 μmol/g (n = 6). These results implicate proteins similar to CaR in the initiation and control of AA release during hypo-osmotic cellular volume regulation in bivalves.