

In alternative embodiments, the invention provides compositions and methods for manipulating the exchange of water and/or carbon dioxide (CO₂) through plant stomata by controlling the expression of a novel apoplastic subtilisin-like serine endopeptidase-like protein. In alternative embodiments, the invention provides plants having increased water use efficiency, and drought-resistant plants; and methods for engineering of water transpiration and water use efficiency in plants, and engineering plants with increased water use efficiency and drought-resistant plants.