Sodium proto-bacteria

Ancestor with a sodium energetics and a common precursor of the F/V ATPase

Ancestor with a ion-leaky membrane and a F/V-type translocase

Diverse bacteria

Cyano-bacteria

Plants

Fungi, protozoa

Ancestral eukaryote

Diverse archaea

Sodium proto-archaea

Diverse bacteria

Na⁺ cycle

Na⁺ cycle

Na⁺ cycle

ATP

ADP+P

ATP

ADP+P