

The Nramp family (Natural Resistance-Associated Macrophage Protein) includes secondary active transport proteins transporting divalent metal ions together with protons into a cell. Divalent metal ions play a major role in the cell metabolism and participate in many intracellular processes. We have studied bacterial Nramp ortholog – MntH (Proton-dependent Manganese Transporter), its transport stoichiometry and other functionally important characteristics. We have found that the external pH affected the transport stoichiometry. The functional differences between the wild type and the protein with mutation N401G appears only in lower external pH. Moreover, uncoupled proton flux mediated by MntH under specific experimental conditions is inhibited by calcium, whereas coupled proton flux increases after the addition of calcium ions. This can be connected to the fact that calcium is also transported by MntH. Surprisingly, the transport stoichiometry of neither the wild type nor the protein with mutation N401G is affected by the addition of calcium or the change of the external medium.