

The Natural Resistance-Associated Macrophage Proteins (Nramp) form a functionally conserved family of proton-dependent divalent metal ion transporters. In the present study, we investigated transport properties of a prokaryotic Nramp homolog - MntH transporter from *Escherichia coli*. H⁺ transport mediated by MntH was monitored in a bacterial model system using pH-sensitive green fluorescent protein (pHluorin). Our experimental conditions enabled us to observe an uncoupled H⁺ transport mediated by MntH. Uncoupled H⁺ flux had been previously described in eukaryotic Nramp proteins, nevertheless this is the first observation of this phenomenon in a prokaryotic homolog. We demonstrated that the uncoupled H⁺ transport is pH- and temperature- dependent. The uncoupled transport H⁺ is also affected by specific single-point mutations at functionally important residues Asp34, His211 and Asn401. The second part of the work focused on the effect of different ions, which are not MntH substrates, on transport properties of MntH. It was shown that addition of excess calcium or magnesium resulted in an increase of H⁺ transport induced by divalent metal ions, but on the other hand our data suggest that calcium inhibits uncoupled H⁺ transport.