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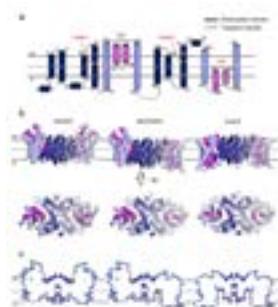
# STRUCTURAL BIOLOGY

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## Structural basis of sodium/citrate symporter as a secondary transporter

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The sodium-dependent citrate transporter of *Klebsiella pneumoniae* (*KpCitS*) belongs to the 2-hydroxycarboxylate transporter (2-HCT) family and allows the cell to use citrate as sole carbon and energy source in anaerobic conditions. We present crystal structures of *KpCitS* in its citrate-bound outward-facing as well as citrate-free inward-facing state. The structure of the asymmetric *KpCitS* homodimer containing both outward- and inward-open protomers was also determined. The structures reveal that the *KpCitS* dimerization domain remains stationary throughout the transport cycle due to an extensive hydrogen bond network as well as hydrophobic interactions. In contrast, its transport domain undergoes a  $\sim 35^\circ$  rigid-body rotation and a  $\sim 17$  Å translocation perpendicular to the membrane to expose the substrate-binding site alternately to either side of the membrane. Homology models of two other 2-HCT proteins based on the *KpCitS* structure offer structural insights into their differences in substrate specificity at a molecular level. On the basis of our results and previous biochemical data, we propose that the activity of the 2-HCT family of transporters involves an elevator-like movement in which the transport domain itself traverses the lipid bilayer, carrying the substrate into the cell in a sodium-dependent manner.



### Biography

Mi Sun Jin is an Assistant Professor in School of Life Sciences, GIST since 2014. She completed BS in 2002 from Sogang University, MS in 2004 from KAIST, and PhD in 2008 from KAIST (under the supervision of Jie-Oh Lee). She held two Postdoctoral Fellowships; one from 2008-2009 at KAIST (Advisor: Jie-Oh Lee), and other from 2009-2013 from Purdue University (Advisor: Jue Chen). From 2013 to 2014, he worked as Research Specialist in Purdue University.

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