

# Structure of the Sodium-dependent Phosphate Transporter Reveals Insights into Human Solute Carrier SLC20

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## Abstract

Maintaining phosphate (Pi) balance is essential for the growth and development of all organisms, and phosphate transporters are key factors in sustaining phosphate homeostasis in humans, plants, fungi, and bacteria. Human phosphate transporter (hPiT) dysfunction causes numerous diseases, but the molecular mechanism underlying transporters remains elusive. In humans, the sodium-dependent phosphate transporter belong to solute carriers, SLC20 (PiT) families, which prefer monovalent (H<sub>2</sub>PO<sub>4</sub><sup>-</sup>). The crystal structure of the sodium- dependent phosphate transporter from *Thermotoga maritima* (*TmPiT*) in complex with sodium and phosphate (*TmPiT*-Na/Pi) was determined at 2.3-Å resolution. The phosphate and sodium ions identified in the *TmPiT* structure. Based on the crystal structure of *TmPiT*-Na/Pi, an elevator-like mechanism for sodium and phosphate transport by *TmPiT* proposed.

**Keywords** - sodium- dependent phosphate transporter, elevator-like, human solute carrier SLC20

## References

- [1] Jia-Yin Tsai, Chen-Hsi Chua, Min-Guan Lin, Ying-Hsuan Chou, Rwei-Yi Hong, Cheng-Yi Yena, Chwan-Deng Hsiao\*, Yuh-Ju Sun\*. *Sci. Adv.* 2020; 6 : eabb4024