

# Modeling of the pedal bin mechanism of the SusCD channel complex

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The large intestine is highly populated with microorganisms which plays an important role in human health and nutrition. The dominant Gram-negative phylum *Bacteroidetes* degrade complex polysaccharides that cannot be metabolized by the host and their survival depends on their ability to import these nutrients by an outer membrane protein complex SusCD. The unresolved question is how the SusC and SusD are coupled to transport the nutrients is unknown. In this study, X-ray crystallography, molecular dynamics (MD) simulations and single-channel electrophysiology reveal a ‘pedal bin’ mechanism, in which SusD moves away from SusC in a hinge-like fashion in the absence of ligand to expose the substrate-binding site. Our results provide deeper insights into OM nutrient import by members of the *Bacteroidetes*, which is of major significance for understanding the human-microbiota symbiosis.

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