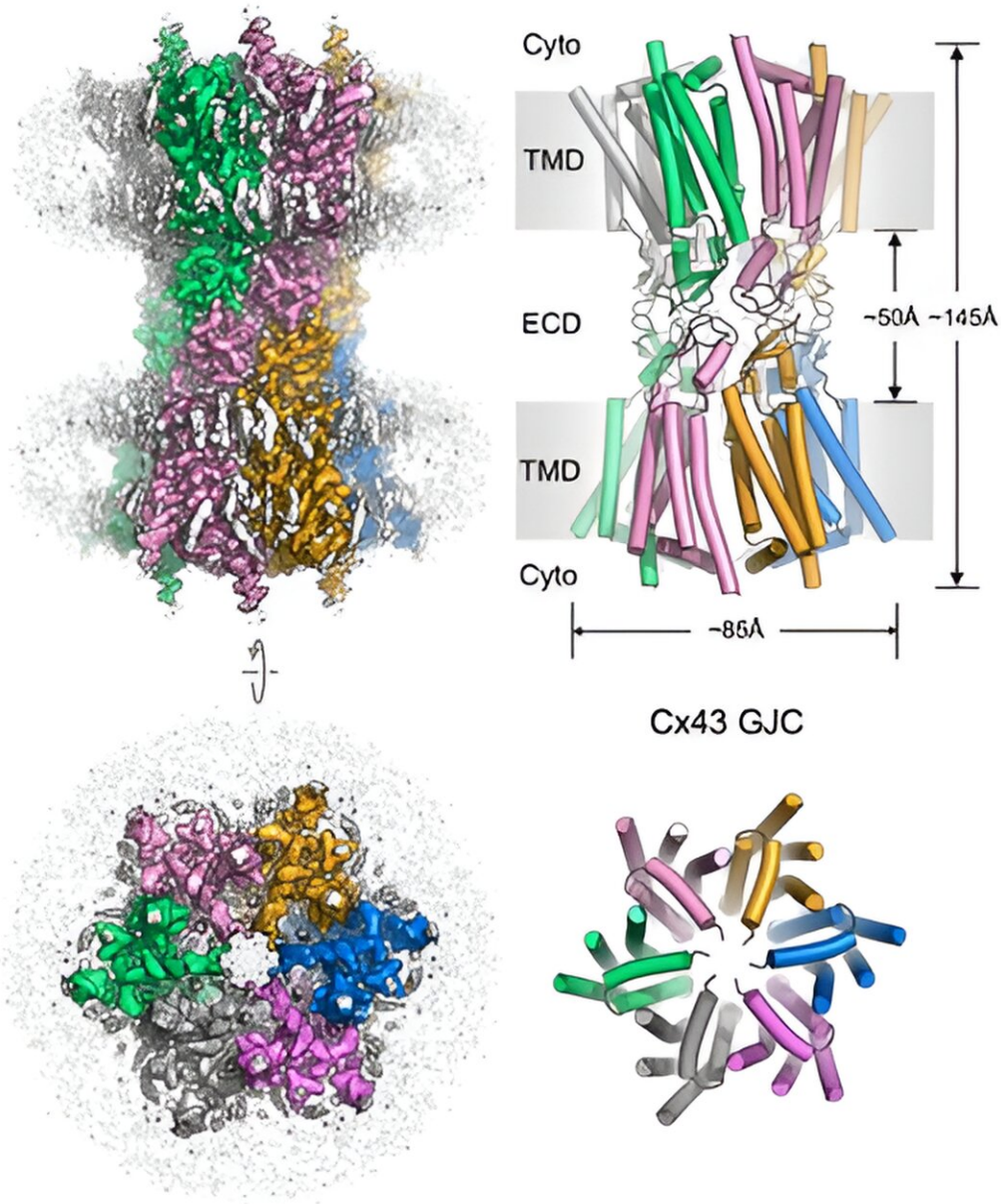


Structures of connexin-43 gap junction channel and hemichannel in a putative closed state

August 14 2023, by Dominic Dähler



Structure of human connexin-43 (Cx43) gap junction channel (GJC). (A, B) Cryo-EM density map and model of Cx43 GJC solved by cryo-EM at 2.26 Å resolution. The individual Cx43 monomers in each hemichannel (HC) within the GJC are colored blue, pink, grey, green, salmon, and orange. Grey densities correspond to the detergent micelle and the bound sterol-like molecules. Credit: *eLife* (2023). DOI: 10.7554/eLife.87616

A recent *eLife* paper by the group of Volodymyr Korkhov (IMBB, ETHZ & PSI), in collaboration with the Francesco Gervasio (UniGe), Mario Bortolozzi (UniPD), Paola Picotti (IMSB, ETHZ) and Nicola Zamboni (IMSB, ETHZ) groups describes the structures of connexin-43 gap junction channel and hemichannel in a putative closed state.

Gap junction channels (GJCs) mediate intercellular communication by connecting two neighboring [cells](#) and enabling direct exchange of ions and small molecules. Cell coupling via connexin-43 (Cx43) GJCs is important in a wide range of cellular processes in health and disease, yet the structural basis of Cx43 function and regulation has not been determined until recently.

The team described the structure of a human Cx43 GJC determined by cryo-EM and single particle analysis at 2.26 Å resolution. The pore region of Cx43 GJC features several lipid-like densities per Cx43 monomer, located close to a putative lateral access site at the monomer boundary.

The researchers found a previously undescribed conformation on the cytosolic side of the pore, formed by the N-terminal domain and the transmembrane helix 2 of Cx43 and stabilized by a small molecule.

Structures of the Cx43 GJC and hemichannels (HCs) in nanodiscs revealed a similar gate arrangement. The features of the Cx43 GJC and HC cryo-EM maps and the channel properties revealed by [molecular dynamics simulations](#) suggested that the captured states of Cx43 may correspond to a novel conformation of the channel, a closed state.

More information: Chao Qi et al, Structure of the connexin-43 gap junction channel in a putative closed state, *eLife* (2023). [DOI: 10.7554/eLife.87616](#)

Provided by ETH Zurich

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