New research helps explain how connexin hemichannels are kept closed

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Hemichannels are connexin channels that can dock with each other to create a gap junction across two plasma membranes. In the June 2009 issue of the *Journal of General Physiology* (*JGP*), Andrew Harris (University of Medicine and Dentistry, New Jersey) discusses new research that provides insight into how hemichannels are kept closed and lays the framework for more specific questions regarding how they open in certain conditions as part of a junctional channel (1).

As Harris explains, the gating mechanism that controls the opening and closing of hemichannels—known as "loop gating"—must remain mostly closed when unapposed and able to open when docked to another hemichannel. The relationship between the loop-gating mechanism and the structure of hemichannel docking, however, has been unclear.

Harris discusses the new research that is advancing our understanding of this relationship, including a report by Tang et al. in the June issue of *JGP* (2). The report, along with a recent publication from Verselis et al. (3), provides new information about the conformational changes that occur within the loop gate. In addition, the concurrent unveiling of a high-resolution structure of a connexin channel has been a long-awaited and noteworthy development (4).

According to Harris, these studies go a long way in explaining what keeps unapposed hemichannels closed and identifying new questions that provide a "welcome challenge" for researchers going forward.

More information:

1. Harris, A.L. 2009 *J. Gen. Physiol*. doi:10.1085/jgp.200910256.
2. Tang, Q., et al. 2009. *J. Gen. Physiol*. doi:10.1085/jgp.200910207.
3. Verselis, V.K., et al. 2009. *J. Biol. Chem*. 284:4484.
4. Maeda, S., et al. 2009. *Nature*. 458:597.

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