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Structural Insights into TRPM Channels. A Long and Unexpected Journey

Wednesday, 14 September 2022 10:15 (30 minutes)

The Transient Receptor Potential Melastatin (TRPM) family belongs to the superfamily of TRPcation channels. These targets have increased their scientific interest so much that in 2021, David Julius and Ardem Patapoutian won the Nobel Prize in Physiology or Medicine “for their discoveries of receptors for temperature and touch.” [1]

This subfamily is composed of eight members that are involved in several biological functions covering from temperature sensing, inflammation, hormones secretion, and redox sensing.

In 1998, when TRPM1 was cloned, the functions, structure and pharmacology of this family were studied in depth. Thanks to cryo-EM technology and computer simulations, many complete and partial structures of TRPM2, TRPM4, TRPM8 and TRPM7 have been determined, allowing understanding of the mechanisms that are finely regulated by these complex protein structures. [2,3]

Given the growing interest in TRP receptors and their ligands, combining in silico simulation and experimental data, we have focused our efforts on an M subfamily. In this work, we will show the results obtained from Cryo-EM experiments reporting the low-resolution structural reconstruction (Figure 1) of one of these interesting targets and the main differences among TRP subfamilies.

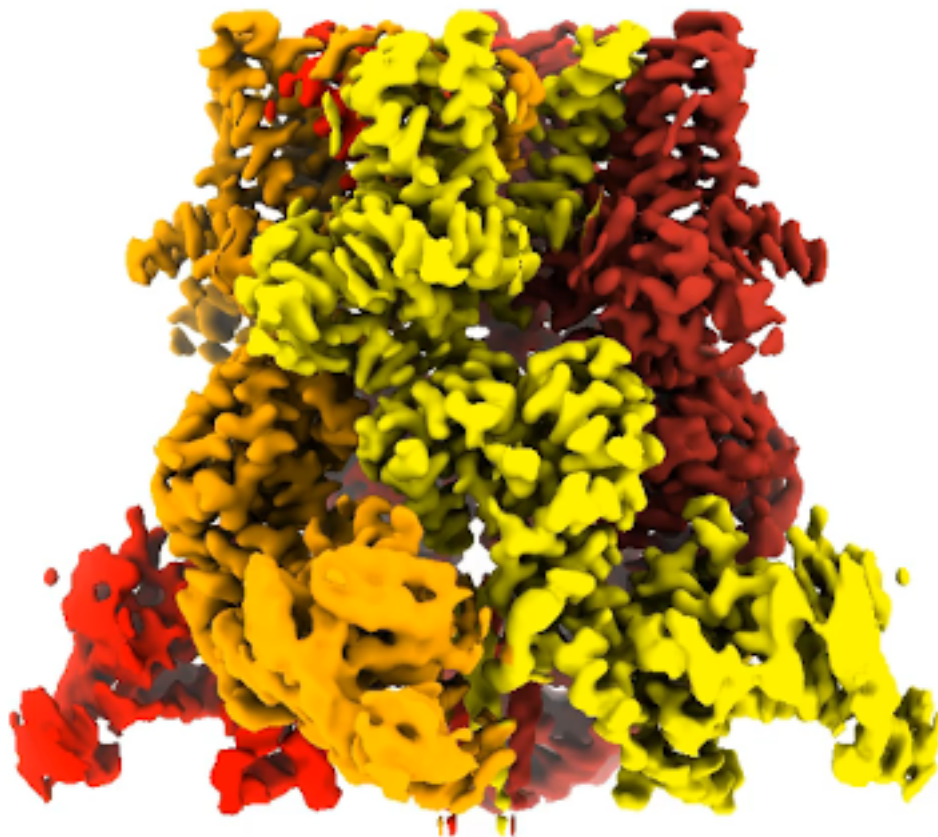


Figure 1:

Figure 1. Cryo-EM reconstruction of TRPM channel.

[1] <https://www.nature.com/collections/dbajaadecj/>

[2] Huang, Y., Fliegert, R., Guse, A.H., Lü, W., Du, J., Cell Calcium 2020, 85, 102111.

[3] Talarico, C., Gervasoni, S., Manelfi, C., Pedretti, A., Vistoli, G., & Beccari, A. R., International journal of molecular sciences 2020, 21(7), 2265.

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