**Evolution of Thermosensor TRPV3 Channels: Opposite Temperature Sensitivity between Mammals and Western Clawed Frogs**

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Transient receptor potential (TRP) channels serve as thermosensors in a wide variety of animals, thus intriguing targets for understanding thermal adaptations in the evolutionary process. TRPV3 perceives warm temperature and serves as a sensor to detect ambient temperatures near the body temperature of homeothermic animals such as mammals. In addition, it is also activated by several chemical compounds. To examine the functional evolution of TRPV3, we cloned the gene from western clawed frog and green anole lizard and found that the N- and C-terminal regions of western clawed frog TRPV3 were highly diversified from those of amniote (reptile, bird, and mammal) TRPV3. Regarding chemical sensitivity, green anole TRPV3 responded to several chemical compounds that activate mammalian TRPV3, while western clawed frog TRPV3 did not respond to several mammalian activators. Surprisingly, western clawed frog TRPV3 was not activated by heat stimuli, but instead was activated by cold stimuli. Temperature thresholds for activation were about 16°C, slightly below the lower temperature limit for western clawed frog. Thus, western clawed frog and mammals acquired opposite temperature sensitivity of TRPV3 to detect environmental temperatures suitable for their respective species, indicating that thermosensors can dynamically change their properties to adapt to thermal environments during evolution.