The dynamic of tube feet controls the locomotion of sea stars



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Even if for most of us sea stars seem motionless, they actually can move slowly to catch their prey or climb the rocks. Indeed, their oral surface is covered by many small and active tubular projections, known as tube feet or podia, connected to their water vascular system. The increase in internal pressure is translated into the elongation of the tube foot that subsequently comes in contact with the substrate and adheres transiently to it. Extension and retraction of the podia make possible the highly organized stepping movement by which the sea stars pull themselves along. While the operation and coordination of sea star tube feet have been studied extensively, the locomotion mechanism is still not fully understood.



Conclusion

The overarching goal of this project was to figure out the parameters that truly impact sea star locomotion. Interestingly, we find out that the crawling speed is **inversely proportional** to tube foot adhesion time. In the long term, we aim to develop a **biomechanical model of sea star locomotion** based on our measurement of tube feet dynamics.

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