

# MIMS現象数理カフェセミナー

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Evolution of symbionts to limit their own cell division for reproductive synchrony with the host

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**Abstract:** In mutualism between unicellular hosts and their symbionts, symbiont's cell division is often synchronized with its host's. The synchronization ensures the permanent relationship between symbionts and their hosts. However, if symbionts stopped synchronizing their cell division and divided faster than their host, they would proliferate more efficiently. Thus, it seems to be paradoxical that symbionts evolve to limit their own cell division for the synchronization. Here, we theoretically explore the condition for the evolution of self-limited division of symbionts. Our analysis shows that symbionts decrease their cell division rate evolutionarily if not only symbiont's but also host's benefit through symbiosis is large. It means that, under mutualistic relationship, symbionts are willing to reduce their cell division rate even if hosts do not force symbionts to limit cell division. Moreover, our result indicates that mutualistic relationship should be established in advance of the evolution of synchronized cell division. This is a joint work with Hisashi Ohtsuki (SOKENDAI) and Akira Sasaki (SOKENDAI).



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