Toward the creation of induced pluripotent small (iPS) molecules inspired by naturally occurring polyene macrolactams

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Progress in genome-guided discovery of secondary metabolites has facilitated the identification of naturally occurring polyene macrolactams and their polycyclic lactam derivatives from microorganisms. Recent studies revealed that some transformations from parent macrolactams to their polycyclic derivatives proceeded without the aid of enzymes and were only dependent on external environmental stimuli such as light irradiation, heating, and aerobic conditions. Interestingly, some polyene macrolactams such as heronamide C and niizalactam A (Figure 1A) are converted in response to the different stimuli into polycyclic lactams with different polycyclic skeletons and biological activity. We have regarded such precursor compounds as "*pluripotent stem molecules*" and have been working on not only the chemical and reactivity analysis of these molecules but also the creation of their synthetic versions, which we named "*induced pluripotent small (iPS) molecules*" (Figure 1B) after *iPS cells*. In this presentation, we first briefly review the structure, reactivity, biogenesis, and biological activity of naturally occurring polyene macrolactams. Then our current efforts toward creating iPS molecules inspired by naturally occurring polyene macrolactams will be presented.

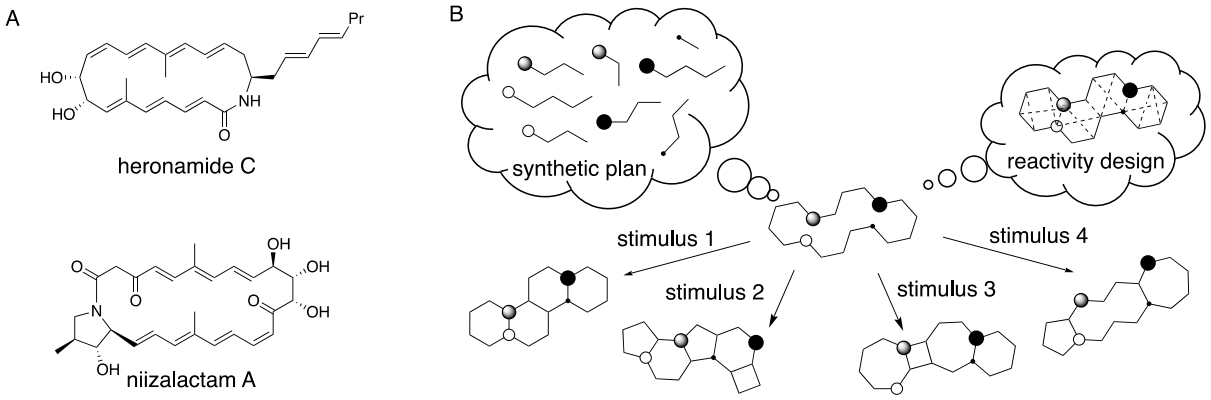

Figure 1. Examples of naturally occurring polyene macrolactams (A) and a concept of an induced pluripotent small molecule (B).

References

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