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### **Gut biomimetic system, AI, data-based discovery of bioactive natural products**

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#### ***Abstract***

The gut environment and intestinal microbiota are known to have a close association with human health and disease. The consumption of natural products is considered a safe and reliable method to remodel the intestinal environment. We have established a gut biomimetic system and tried to discover natural product prebiotics that can promote intestinal health and modulate the gut-organ axis. We believe that these natural product prebiotics could be developed as pharmaceuticals and nutraceuticals that can prevent or treat various human diseases. In this talk, schisandrin C, a dibenzocyclooctadiene lignan isolated from *Schisandra chinensis*, which is a traditional herbal medicine in Asian countries including China, Japan, Korea, and Vietnam, will be explained as an example of natural product prebiotics. *Schisandra chinensis* is also a popular tea plant in Korea. Schisandrin C ameliorates intestinal permeability dysfunction in cultured human intestinal monolayers as well as in the model animal *Caenorhabditis elegans*. In addition, schisandrin C also changes intestinal microbiota composition. We also elucidated the molecular mechanism underlying the effects of schisandrin C based on AI-based target protein prediction and network pharmacology analysis. I would also like to discuss the natural product potential to treat various human intractable diseases.