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Novel strategy for the delivery of probiotic *Lactobacillus rhamnosus* GG to the mouse intestine using a microdevice-based delivery system

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Oral consumption of probiotic microorganisms is thought to provide various beneficial effects to the host. However, probiotics encounter harsh conditions through the gastrointestinal tract, which may decrease the gut colonisation potential.

The polymeric micrometer-sized devices called microcontainers serves as vehicles to protect and deliver probiotics at target locations by using specific biodegradable coatings. The microcontainers have previously been shown to be suitable for improving intestinal drug absorption in rats through oral delivery[1].

In this pilot study, we allocated 18 germ-free mice in 3 groups, which were dosed with capsules either containing *L. rhamnosus* GG (LGG), microcontainers filled with LGG and coated with Eudragit® L 100-55 or empty microcontainers. We found that delivery of LGG to the intestine of germ-free mice loaded into microcontainers was comparable to delivery of LGG without microcontainers. Since LGG is highly stable in the gastric environment[2], high survival of LGG cells even without confinement in microcontainers was expected. However, the microcontainers have the potential to maintain a high cell survival rate, which also applies to bacteria that are more susceptible, and enhance the gut colonisation potential through targeted delivery. Further investigations are currently being conducted to evaluate the colonisation properties and effects of probiotics delivered to the gut using microcontainers.

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