Symposium | MDD：[Symposium 53] How does the gut microbiota contribute to elucidating the mental health in children and adolescents?

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[Symposium 53] How does the gut microbiota contribute to elucidating the mental health in children and adolescents?

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[SY-53-02] Dog ownership, microbiota, and adolescent mental health: insights from human and mouse studies

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Adolescence is a critical period for neurodevelopment and social maturation, during which mental health can be shaped by environmental influences. Among these, the presence of companion animals—especially dogs—has been linked to improved emotional well-being. However, the biological basis of this association remains unclear.
In our recent study, we examined whether dog ownership during adolescence could influence mental health via changes in the microbiota. Using data from a longitudinal adolescent cohort in Tokyo, we observed that adolescents living with dogs had lower scores for social and behavioral problems compared to their peers. To further explore this connection, we transplanted microbiota from dog-owning and non-dog-owning adolescents into germ-free mice. Interestingly, mice colonized with microbiota from dog-owning adolescents showed enhanced social behavior, suggesting a functional link between microbiota composition and sociality.
These findings suggest that the positive psychological effects of living with dogs may be mediated, at least in part, by the microbiota. Our work points to a novel “dog–microbiota–brain” axis that may underlie the emotional benefits of dog companionship during adolescence. This axis could have important implications for understanding how everyday environmental exposures influence mental health trajectories, and may offer insights into microbiota-based strategies for supporting adolescent development.