Microbiome Gut-Brain interaction in Anorexia Nervosa (MiGBAN)

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Anorexia nervosa (AN) is one of the most common chronic disorders in adolescence with high mortality rates. Treatment is only moderately effective; less than 50% fully recover. Knowledge on gutbrain interaction might help to develop new therapies, as severe starvation-induced changes of the microbiome in AN patients, have been demonstrated previously. Animal models elucidate that the microbiome influences body weight, brain development and depression-like states.
Our work plan comprises an observational study and two phase II RCTs with the application of omega-3-PUFA and a multistrain psychobiotic to both, humans and rodents. To understand the pathomechanisms neuroimaging and neuropsychological testing will be performed in parallel in patients and rodents. With the help of a well-established animal model for AN, the effect of stool transplants from patients to rodents will be analyzed. Longitudinal MRI will be conducted in rodents together with cellular and molecular brain analyses. Effects of the microbiome on the dopamine system linked to typical symptoms of AN will be assessed using fiber photometry. In addition, immune response and circulating antibodies associated with the presence of certain bacterial strains and interacting with hunger and satiety hormones will be explored. By this translational research it will be possible to systematically investigate the causal role of an altered microbiome for the course of AN and to identify new therapeutic tools.