

Science paper - Importance of compatibility of donor and recipient in FMT

Amsterdam – A recent Science paper¹ coauthored by the founding fathers of Caelus Health, Profs Max Nieuwdorp and Willem M de Vos, provides new insight in fecal microbiota transplantation (FMT). Deep metagenomic sequence and subsequent bioinformatic analysis by the team of Prof Peer Bork at EMBL Heidelberg, provided insight at the strain level on what bacteria win or loose during FMT.

It was shown that compatibility between donor and patient likely plays a bigger role in FMT than previously thought. This also provides an explanation for the existence of responders and non-responders that is frequently observed in these interventions. It is expected that the study could help make FMT a valid treatment option for more conditions than they are currently applied to. Moreover, it emphasizes the need for a personalised approach.

The CEO of Caelus Health, Luc Sterkman MD, says about this study: "These results provide an excellent fit with the FMT pipeline that Caelus Health has developed and includes the identification, testing and application of specific bacterial strains that are instrumental in the treatment of metabolic syndrome."

The study found that after FMT, new strains of microbes from the donor were more likely to colonise a patient's gut if the patient already had that species. This implies that if doctors can match donors to patients, the chances of the treatment being a success could improve considerably. Looking at strains rather than species of bacteria could also make the therapy effective in conditions where it isn't currently working.

"With this method, we can really see if, for example, an antibiotic-resistant strain is replaced by a non-resistant one" says Willem M de Vos, who led the work at Wageningen University and the University of Helsinki, "so it could help to design stool transplants to work in other conditions beyond the presently practiced treatment of recurrent *Clostridium difficile* infections. Moreover, it allows us to study in more detail the responders and non-responders in the FMT trials that we now have ongoing at the Amsterdam Medical Center with Max Nieuwdorp".

Max Nieuwdorp indicates that the present studies have been done with fecal samples and states "it would be of interest to apply this approach to the bacteria in the upper intestinal tract where we think most of the metabolic signal transduction takes place".

The Science study¹ builds on a clinical trial that used FMT as a treatment for metabolic syndrome, run by Max Nieuwdorp at the Academic Medical Centre in Amsterdam. This successful FMT has already led to the first bacterial product that Caelus Health is developing and is now in a Phase 1-2 trial.

1 Li S, A Zhu, V Benes, PI Costa, H Hercog, F Hilderbrand, J Huerta-Cepas, M Nieuwdorp, J Salojarvi, AL Voigt, G Zeller, S Sunagawa, WM De Vos & P Bork (2016) Durable coexistence of donor and recipient strains after fecal microbiota transplantation. Science 352; 586-589.

*Caelus Health is an Amsterdam-based biotech company. Caelus is dedicated to the commercialisation of functional food and pharmaceutical products for the prevention and early treatment of cardio-metabolic diseases. Based on the strong correlation between the intestinal microbiome and health, the company is developing an entirely new class of microbiota-based therapeutics for the reduction of insulin resistance and prevention of Type 2 Diabetes Mellitus (T2DM) in people with metabolic syndrome (MetS). The first product is now in clinical phase of development and is based on *Eubacterium hallii*. Life Sciences Fund Amsterdam (LSFA) is the founding investor.*



AMC, the Academic Medical Center (AMC) is one of the foremost research institutions in the Netherlands, as well as one of its largest hospitals. Over 7000 people work at AMC to provide integrated patient care, fundamental and clinical scientific research, and teaching. The AMC complex houses among others the university hospital and the faculty of medicine of UvA as well as the Emma Children's Hospital and the Netherlands Institute for Neuroscience. A number of biotech companies (some of which are AMC spin-offs) are also located on the premises. This concentration of expertise makes the centre a breeding ground for fruitful scientific collaboration.

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