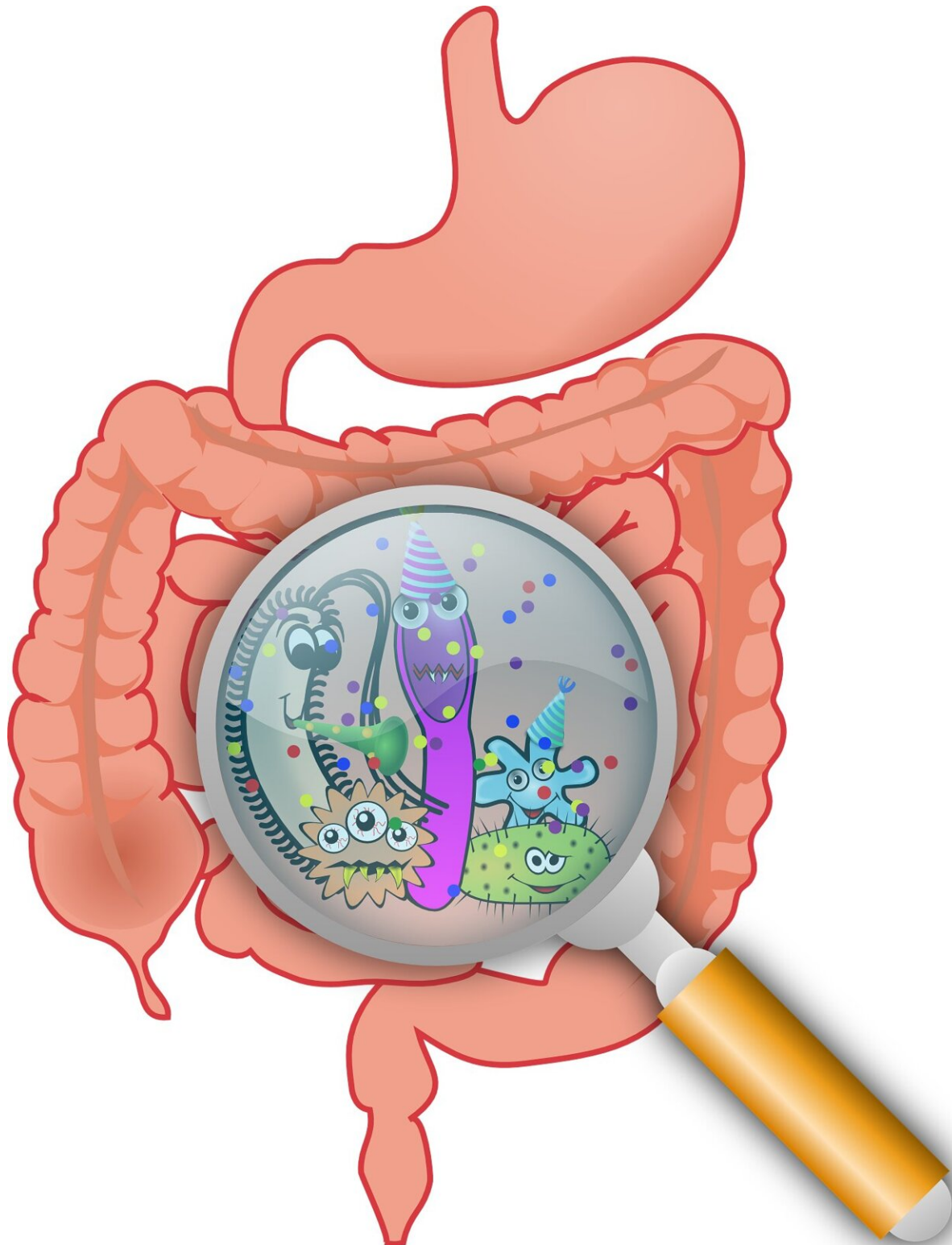


# **Bowel habits written in the DNA: New clues for irritable bowel syndrome**

December 8 2021

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In a large-scale study published in *Cell Genomics*, researchers studied the DNA of more than 160,000 people who provided information on the frequency of their bowel movements. Genetic profiles and specific genes were identified, which influence bowel habits and susceptibility to irritable bowel syndrome, the most common gastrointestinal disorder.

How often people move the bowels is important for wellbeing, and reflects correct functioning of the gastrointestinal (GI) tract in digesting and absorbing nutrients, while excreting waste products of digestion and toxic substances. Irregular bowel habits and altered gut motility, including constipation and diarrhea, are often observed in common gastrointestinal conditions like [irritable bowel syndrome](#) (IBS), a disorder that affects up to 10% of the population worldwide. The precise mechanisms regulating peristalsis (the action of intestinal muscles pushing food and feces along the GI tract), as well as the reasons why this is often altered in IBS, are unknown. They may be hidden in our genome, it turns out.

An international team coordinated by Mauro D'Amato, Ikerbasque Research Professor at CIC bioGUNE in Spain, in a research article published online in the journal *Cell Genomics*, have demonstrated for the first time that the frequency of defecation is a heritable character in humans, and that specific [genetic profiles](#) influence bowel habits as well as predisposition to IBS. They studied 167,875 individuals from population-based cohorts in UK (UK Biobank), the Netherlands (LifeLines-Deep), Belgium (Flemish Gut Flora Project), Sweden (PopCol) and U.S. (Genes for Good), and correlated their [genetic makeup](#) with questionnaire data, mostly in relation to a simple query about the number of times one opens the bowels every day (the "stool frequency," as they called it in the study).

They discovered that among people with higher (or lower) stool frequency, specific DNA changes were more common than in the rest of the population. These changes, found in 14 regions of the human genome, involved several genes that were studied more in detail: "We were surprised how much sense these new findings make, highlighting multiple molecules whose role in gut motility was already known from [clinical studies](#), including the communication between the brain and the gut," says Ferdinando Bonfiglio, first author of the study. Some of the genes reported in the study produce neurotransmitters, hormones and other molecules especially active in the brain and nerve cells involved in the control of intestinal peristalsis, and even targeted pharmaceutically to induce bowel movements in previous studies (like BDNF). "These results are very exciting and warrant follow-up studies: once more stool frequency genes are unequivocally identified, we may have a battery of new drug targets to be exploited for the treatment of constipation, diarrhea and common dysmotility syndromes like IBS" explains corresponding author Mauro D'Amato.

The team also reported evidence of a common genetic background for stool frequency and IBS, and that this information may be used to identify individuals at increased risk of disease. This was more informative for IBS predominantly characterized by diarrhea (IBS-D). The researchers translated genetic findings from their study into simple numerical values (called [polygenic scores](#)), to estimate the probability of having altered stool [frequency](#) in each individual. Using data from UK Biobank, they then showed that people with higher polygenic scores were up to five times more likely to suffer from IBS-D than the rest of the population.

"The genetic information and the polygenic scores obtained in this study can be refined and eventually contribute to the classification of patients into different treatment groups, hopefully leading to improved therapeutic precision when aiming to bring gut dysmotility and altered

[bowel](#) habits back to normal. This would be a major step forward in IBS, a common condition for which there is currently no effective treatment that works for all," concludes Mauro D'Amato.

**More information:** Mauro D'Amato, GWAS of stool frequency provides insights into gastrointestinal motility and irritable bowel syndrome, *Cell Genomics* (2021). [DOI: 10.1016/j.xgen.2021.100069](https://doi.org/10.1016/j.xgen.2021.100069).

Provided by CIC bioGUNE

Citation: Bowel habits written in the DNA: New clues for irritable bowel syndrome (2021, December 8) retrieved 26 April 2024 from <https://medicalxpress.com/news/2021-12-bowel-habits-written-dna-clues.html>

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