Health Q Science **Scientists Discover New** Forms of Life Inside **Human Bodies That Don't Match Anything Biology Has Classified** Scientists have uncovered a hidden class of RNA structures deep inside the human microbiome, completely unlike anything seen before. Published on December 27, 2025 at 06:45 | 🕲 Written by Arezki Amiri Reading time: 4 minutes © Scientists Just Found A Strange New Life Form Hiding In Your Body Share this post A newly identified class of RNA molecules has been discovered in bacteria living inside the human body. These circular genetic structures, termed obelisks, differ from known viruses and bacteria and may represent a previously unclassified category of replicating RNA.

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What sets these RNA entities apart is their simplicity. They do not encode proteins, nor do they appear to form protective protein shells. Instead, they consist of short loops of RNA that replicate in ways that remain poorly understood.

Thousands of novel

**RNA loops identified** 

libraries.

in human microbiomes

populations. Their exact function is still unclear.

The findings were led by Nobel laureate Andrew Fire of Stanford University and published as a preprint on bioRxiv , a recognised open-access platform for preliminary biological research. The researchers detected closed-loop RNA structures that lack proteincoding regions, distinguishing them from conventional viral genomes . Instead, the molecules resemble viroids, which are non-coding, circular RNAs known to infect plants, although obelisks have been found only in bacteria associated with humans. 2 iPSC donors Chronic GCs = 10 days 100nM Dex Acute GCs = 12 hours 100nM Dex Vehicle control = DMSO

Researchers identified more than 3,000 unique types of obelisks

while analysing public metagenomic datasets. These included

genetic sequences obtained from human oral and intestinal

designed to detect circular RNA structures within large genomic

microbiomes, using high-throughput computational tools

By applying rigorous sequence filtering to eliminate artefacts, the team identified conserved genetic motifs across multiple samples. Many of the RNA loops were embedded in bacterial genomes, suggesting the structures replicate within microbial cells and may have adapted to specific bacterial hosts over time. No immediate health effects have been linked to these entities.

However, their residence in bacteria that support digestion,

**Atypical structure challenges** 

Obelisks do not conform to known definitions of viruses, plasmids,

relied solely on self-replicating RNA. Entities like obelisks, which

lack both cellular structure and protein machinery, could offer

The obelisks exhibit genetic diversity, with different variants

appearing in specific regions of the body. This may reflect host-

**specific adaptations** to distinct bacterial communities. Whether

they have any regulatory or ecological function in the microbiome

A detailed discussion of this classification issue is presented in the

insight into these early evolutionary stages.

remains unknown.

possible indirect roles in human biology.

microbial classification

# Royal Society Open Science journal, which reviewed recent findings related to novel replicating RNA structures in microbial ecosystems. Implications for RNA biology

and microbial ecology

Additional profiles of researchers involved in the study, such as Dr Mark Peifer at the University of North Carolina and Dr Matthew Sullivan at Ohio State University, reflect the cross-disciplinary approach to understanding these genetic elements. Their work contributes to ongoing investigations into host-microbe interactions, microbial genetics, and minimal RNA replicators. As more human and environmental microbiomes are sequenced, scientists expect further discoveries of novel RNA forms with unknown roles. Whether obelisks are ancient relics of RNA evolution or modern molecular parasites remains unanswered. Current research efforts aim to determine how they persist, how

they are transmitted between bacterial hosts, and whether they

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interact with other components of microbial communities.

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or other mobile genetic elements. They are protein-free, RNA-only replicators that fall outside established microbial categories. This has drawn interest from researchers studying the boundaries of life and how its simplest forms might operate. The implications of the discovery extend into evolutionary biology, particularly in ongoing discussions about the origins of RNA-based life. Some theories suggest early life forms may have

without participating in protein synthesis or cellular regulation as currently understood.

gene regulation and cellular function in both animals and plants.

Obelisks are distinct in that they appear to operate independently,

sequencing to detect molecular entities that do not fit into

The finding also illustrates the power of modern **metagenomic** established classifications. Advances in bioinformatics have made it possible to examine billions of genetic fragments across microbial ecosystems, revealing forms of life that were previously invisible to researchers.

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The findings emerged from a comprehensive analysis of genetic material drawn from human-associated microbial communities. **Obelisks** appear frequently in samples collected from the mouth and gut, among other locations, and may be present across global

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immunity and other functions means future research may explore

The discovery aligns with the broader scientific interest in noncoding and circular RNAs, which have been found to play roles in

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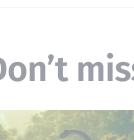
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# Who is the author, Arezki Amiri? Arezki is an Editor-in-Chief and Project Manager

based in Japan, specializing in science and

technological innovation. Originally from Algeria,

he holds a Foreign Languages Diploma from Lycée Zamoum Mohamed, a BA in English from Université Mouloud Mammeri de Tizi Ouzou, and a Nursing Diploma from the Bel Air Institute in Boghni. Bridging science, communication, and humanity, he explores how space research and emerging technologies shape the future of health and society, leading global editorial projects at The Daily Galaxy that translate complex ideas into engaging, cross-cultural stories. Social medias: X @ in The Daily Galaxy -- Great Discoveries Channel is an independent

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