Glycans found binding to mammalian RNA

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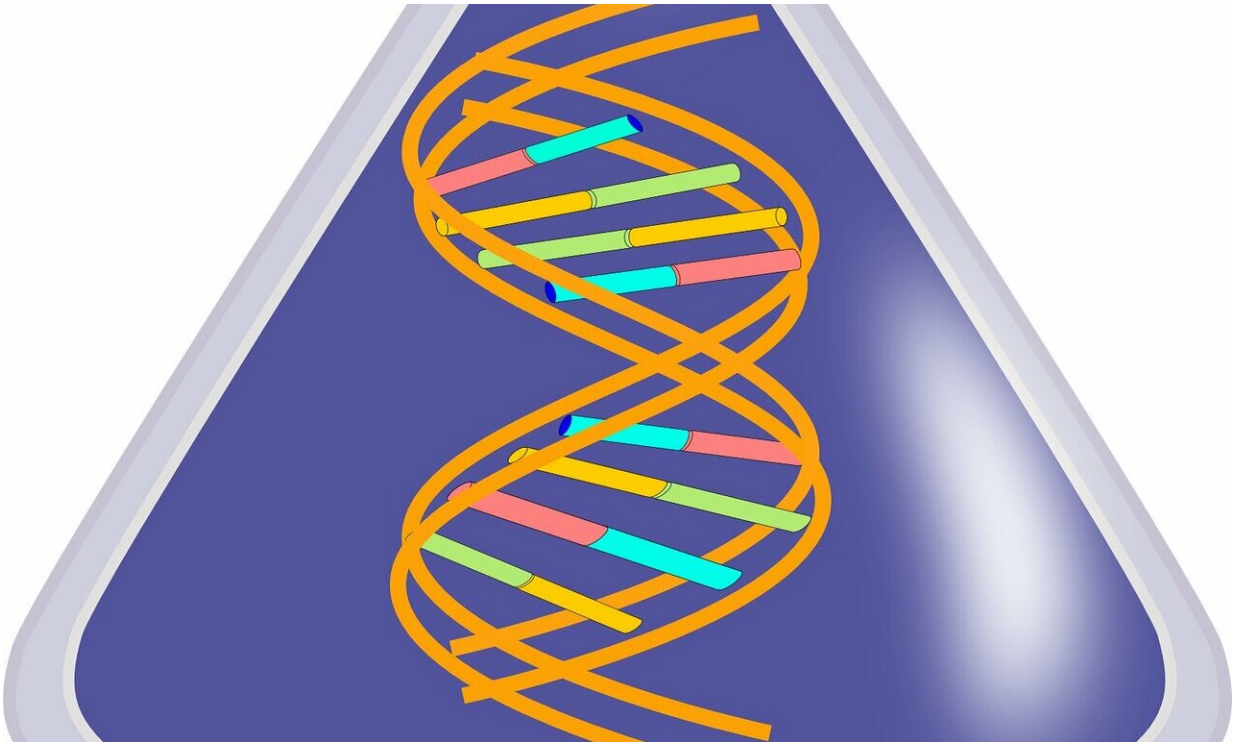

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A team of researchers at Stanford University has found evidence of glycans binding with mammalian RNA. The group has written a paper describing their findings and have posted it on the *bioRxiv* preprint server.

Glycans are a type of sugar thay typically play a role in modifying lipids

and proteins to facilitate molecular interactions. In this new effort, the researchers were studying a process called glycosylation, a reaction that occurs when sugar molecules attach to proteins. As part of their research, one of the team members was labeling glycoproteins when he noticed what appeared to be a glycan attaching to RNA. Such an event had never been observed before. A closer look showed that it was a certain type of sugar called an N-linked glycan, and that it was sticking to Y RNA—a small RNA molecule that is believed to play a role in DNA replication.

RNA is typically found in the nucleus and cytosol inside of cells. Glycosylation generally takes place in the Golgi bodies and endoplasmic reticulum. Thus, for the two molecules to meet, one of them would have to enter cell compartments in ways that have not been seen before. Another possibility would be a molecule that serves as a go-between.

The researchers were naturally quite skeptical of the find, which led to efforts to show that it was an anomaly. As part of that effort, they tried separating out proteins, but discovered that the sample they had found was only sensitive to enzymes that tend to cut up RNA. Further tests showed that such bindings also occurred in hamster and mouse cell cultures. Finally convinced that they were on to something new, the researchers named the bound molecules glycolRNA.

After some further study of the bound molecules, the researchers report that they were not able to figure out how the sugars were binding to the RNA—attempts to separate them failed except when they used enzymes to destroy one or the other molecule. They suggest it appears likely that the linkage is not protein-based and that it seems possible that it could be due to covalent bonding.

The finding by the team has yet to be verified by others, but if confirmed, it will likely open up a whole new avenue of RNA research.

More information: Ryan A. Flynn et al. Mammalian Y RNAs are modified at discrete guanosine residues with N-glycans, *bioRxiv* (2019). DOI: 10.1101/787614