Researchers identify a new tsRNA in blood to improve liver cancer diagnosis

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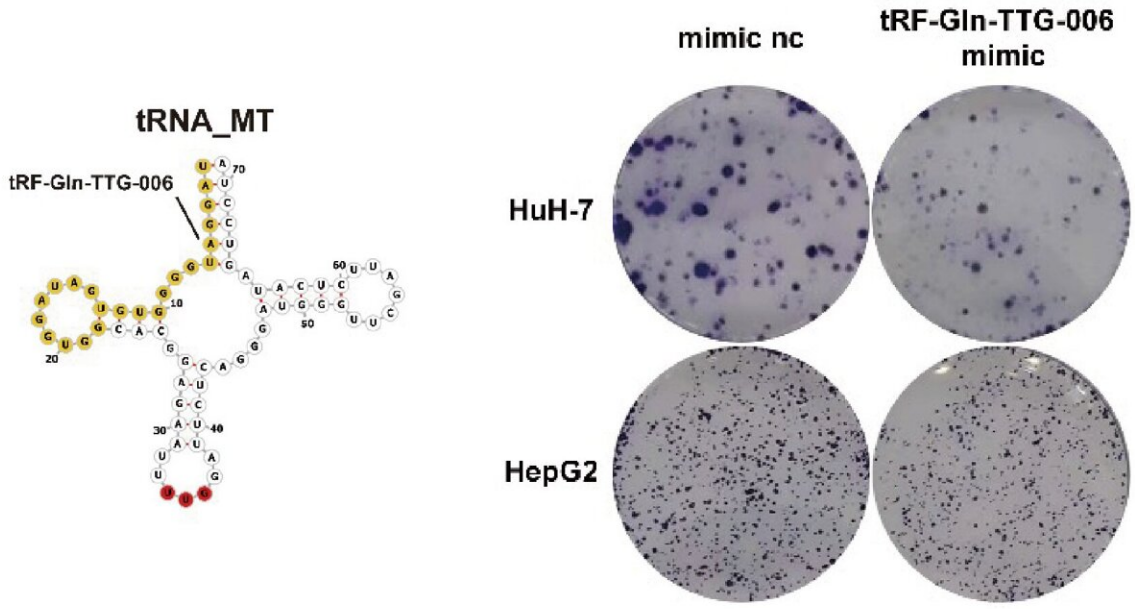

Position of tRF-Gln-TTG-006 in the cloverleaf secondary structure (left) and its inhabited ability to colony formation of both hcc cell lines (right). Credit: Higher Education Press

Hepatocellular carcinoma (HCC) is the most primary liver cancer. It is one of the most common and deadly cancer worldwide, especially in East Asia. Advanced HCC patients expect a significantly low 5-year survival rate as well as poor prognosis. Early diagnosis is of importance

for effective HCC therapies.

Researchers from Nanjing University have now shown that a tsRNA named tRF-Gln-TTG-006 in liver cancer patients' serum may become a promising blood biomarker to detect liver cancer even in the early stage. They also find that this tsRNA may have its potential biological function during HCC progression. The results have been published in *Frontiers of Medicine*.

tRNAs are known for amino acids transfer and thus play a vital role in protein synthesis. The new identified tRF-Gln-TTG-006 is a fragment of its parent tRNA. Unlike its "parent," tsRNA has been found to be a promising blood biomarker and regulator of disease progression in many cancer types. Serum tsRNA signature in HCC has not been elucidated yet. The current study helps fill this gap, in which discovery of HCC-related tsRNA would be valuable in terms of facilitating HCC detection especially at early stage.

To elucidate the tsRNA signature of HCC serum, the researchers adapted high-throughput sequencing specialized for tsRNAs which bear multiple modifications. Sequencing uncovered hundreds of new tsRNAs, which shed lights on a special HCC serum tsRNA profile. The study uses a two-stage validation strategy to screen and verify this unique tsRNA, which can separate early HCC patients from healthy people. When compared with the common used biomarker α-fetoprotein (AFP), tRF-Gln-TTG-006 shows a significantly superior diagnostic accuracy for patients with early-stage HCC. A total of 177 HCC patients are included in the study. The current study also shows tRF-Gln-TTG-006 may originate from tumor cells and affect tumor cell growth and thus take part in the HCC progression.

Yanbo Wang says that "based on our research, tsRNA is a promising biomarker of early HCC diagnosis and our study can provide more

information on the relationship between tsRNAs and the development of liver cancer."

More information: Shoubin Zhan et al, Serum mitochondrial tsRNA serves as a novel biomarker for hepatocarcinoma diagnosis, *Frontiers of Medicine* (2022). DOI: 10.1007/s11684-022-0920-7

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