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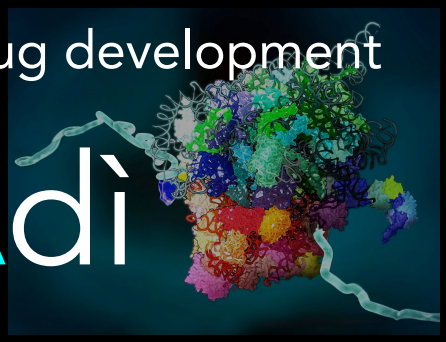
Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA
spoke.6

MUR PNRR National Center for Gene Therapy and Drugs based on RNA Technology

Spoke 6: RNA drug development

veRNAdì



A webinar series about RNA

to share projects and competences,
increase networking, discuss issues
and new ideas, and disseminate results

Every last Friday of the month

➡ *https://rb.gy/y40y6*

XV veRNAdì: May 30 2025, 15:00

Uncovering stress-induced responses in the tRNAome of actively translating ribosomes

Massimiliano Clamer

Immagina Biotechnology, Trento

Living organisms adapt to environmental changes by regulating gene expression at multiple levels, including protein synthesis. During translation, tRNA molecules deliver specific amino acids to the ribosome in a manner coordinated with the sequence encoded in the messenger RNA. However, the precise role of tRNAs, including their modifications, in modulating translation remains poorly understood due to lack of methods to map ribosome selected tRNAs. Traditional analyses of tRNA dynamics often focus on total cellular tRNAs, which can mask subtle, stress-induced changes. To address this challenge, we developed a method to isolate ribosome-associated tRNAs from actively translating ribosomes and applied direct nanopore sequencing to compare these functionally active tRNAs with the total cellular pool in immortalized human cells. This approach combines antibody- and tag-free pull-down of active ribosomes with multiplexed sequencing, enabling comprehensive and comparative measurements of tRNA abundance, charging, and modifications in both the total and ribosome-embedded RNA pools.