Universidad de Navarra
Facultad de Ciencias

**MASTER'S DEGREE IN BIOMEDICAL RESEARCH**
**Research Project Proposal**
Academic year 2023-2024

**Project Nº 46**

**Title:** *Does RNA encode the molecular memory of stress episodes?*

**Department/ Laboratory**
CIMA, Gene Therapy and Regulation of Gene Expression (laboratory 4.03)

**Director** *Tomás Aragón Amonarriz*
**Contact:** *taragon@unav.es*

**Summary**

To ensure a rapid and effective adaptation to environmental, pathogenic or developmental stimuli eukaryotic organisms have evolved a set of RNA-based mechanisms. In our group, we study two intracellular stress responses, the Unfolded Protein Response (UPR) and the Integrated Stress Response (ISR), that promote a transcriptional and translational program to cope with a wide range of stresses including protein misfolding, mitochondrial dysfunction, viral infections, or neurodegenerative stresses. Beyond the rapid, pro-survival gene expression changes that have been exhaustively characterized, we have recently discovered that these mechanisms can also produce long-lived RNAs that remain in the cell for long periods of time, even when the stress episodes that triggered UPR/ISR have ended. We hypothesize that these RNAs act as a molecular memory of stress and condition the behaviour of the cells after damage.
In this project, we will 1) identify the long-lived transcriptome by longitudinally tracking the fate of stress response mRNAs and 2) we will explore if these transcripts indeed alter the behaviour of cells after stress. To that aim, we will use advanced RNA biochemical methods, as well as RNAseq and bioinformatic approaches.

| | |
|---|---|
| **yes** | |
| **no** | **x** |

Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?