

# RNA-Protein Complexes & Cell Proliferation

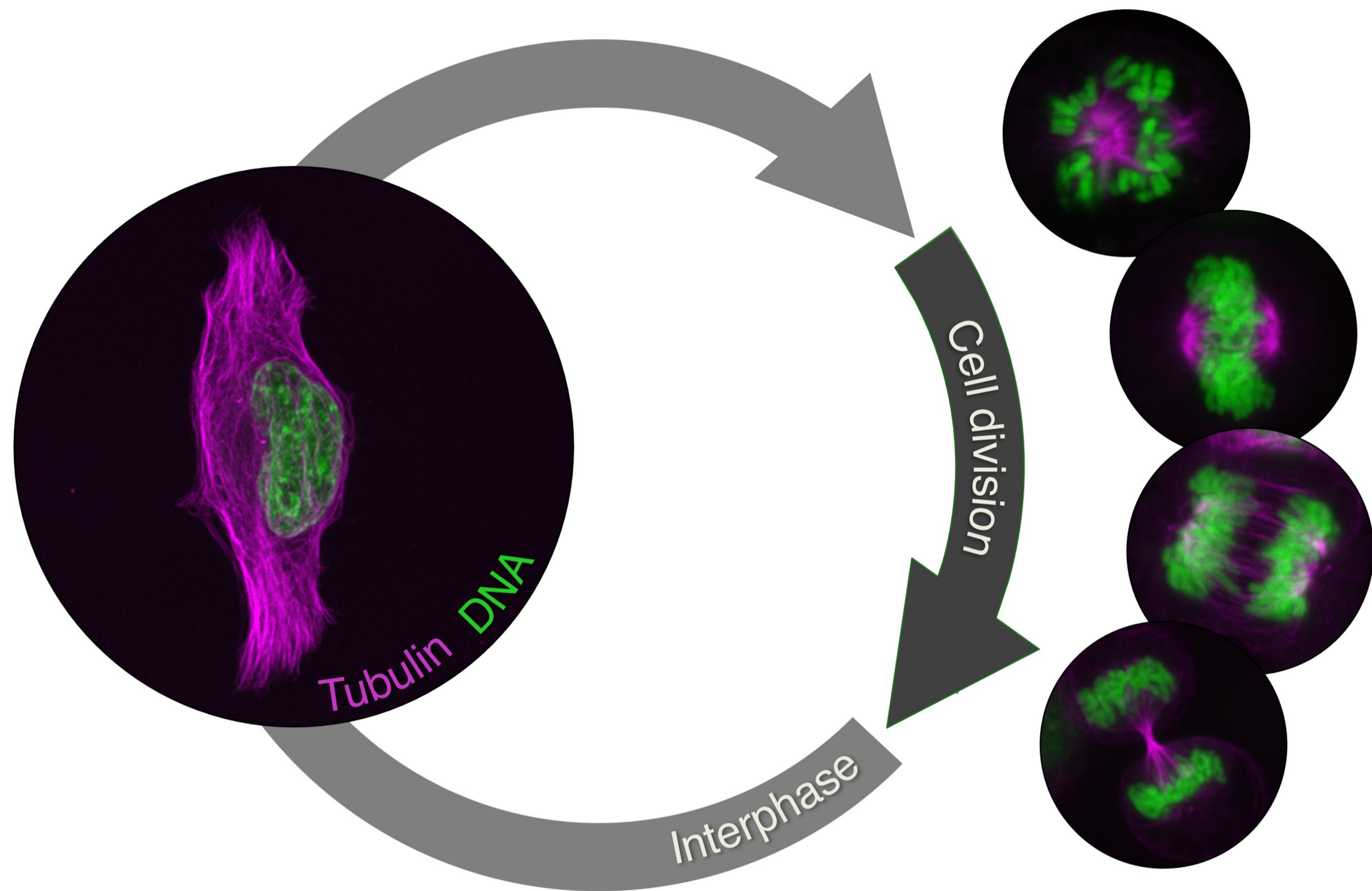
German Cancer Research Center (DKFZ)

dkfz.

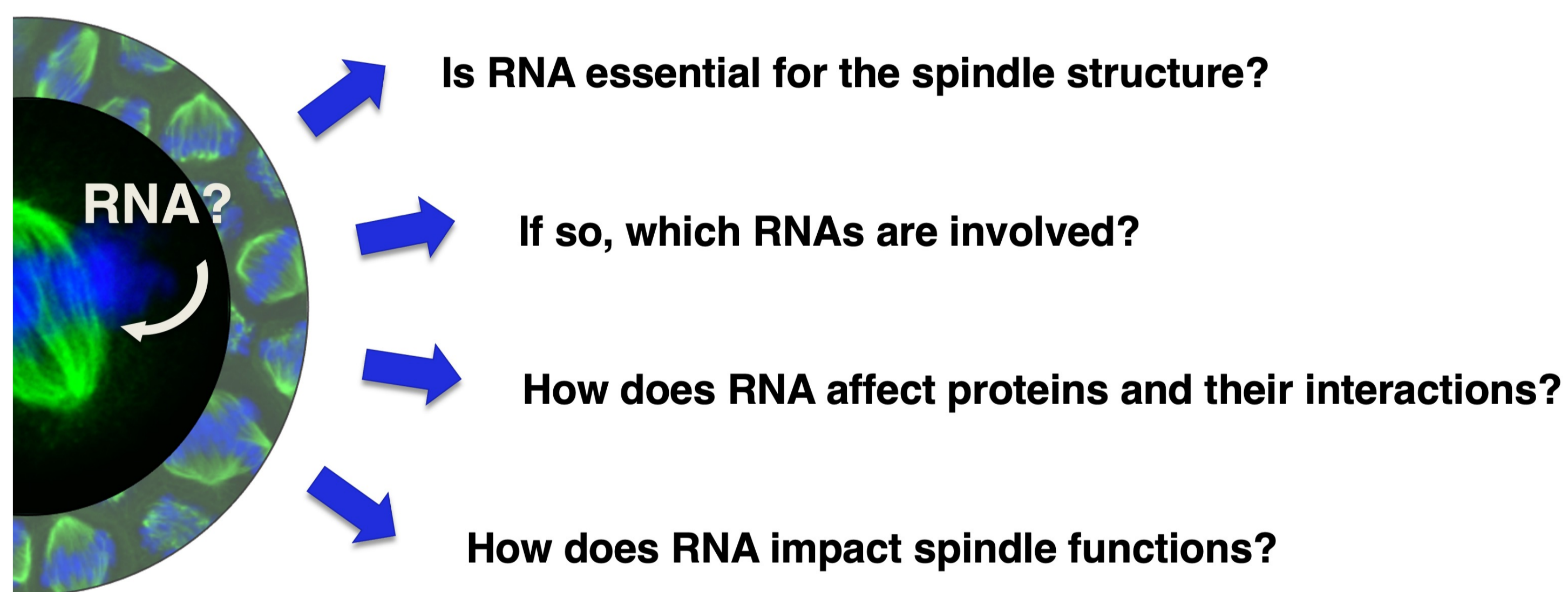
GERMAN  
CANCER RESEARCH CENTER  
IN THE HELMHOLTZ ASSOCIATION



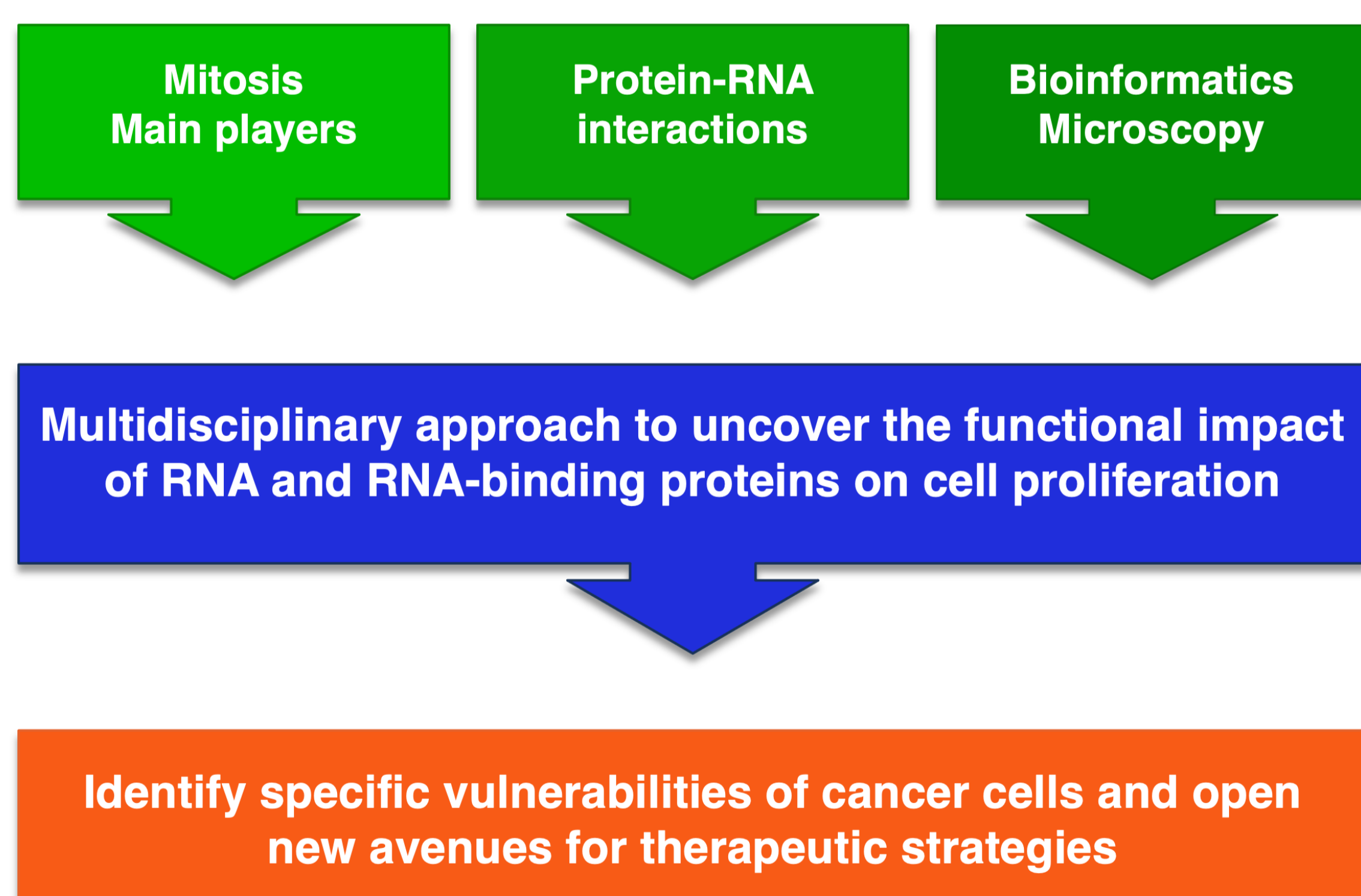
## 1 – Faithful cell division is crucial to preserve genome integrity



## 2 – What is the impact of RNA interactions on cell proliferation?



## 3 – Our strategy



## 4 – R-DeeP: identification of RNA-dependent proteins<sup>1,2</sup>

Search for RNA-dependent proteins in a specific cell line

### Proteins of Unsynchronized Cells

HeLa S3 Proteins

4765



A549 Proteins

3743



### Proteins of Synchronized Cells

HeLa S3 - Interphase Proteins

7069

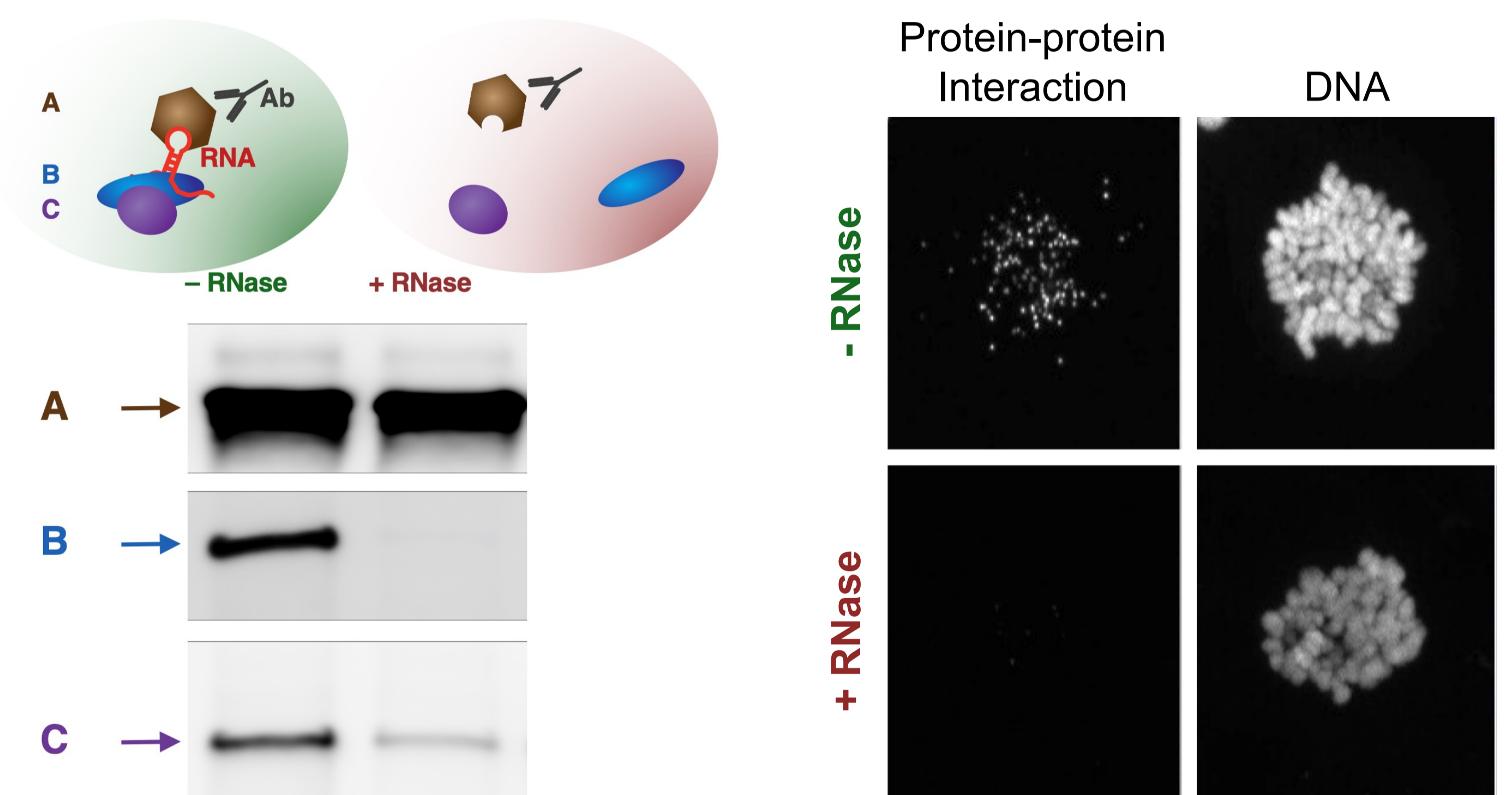


HeLa S3 - Mitosis Proteins

7152



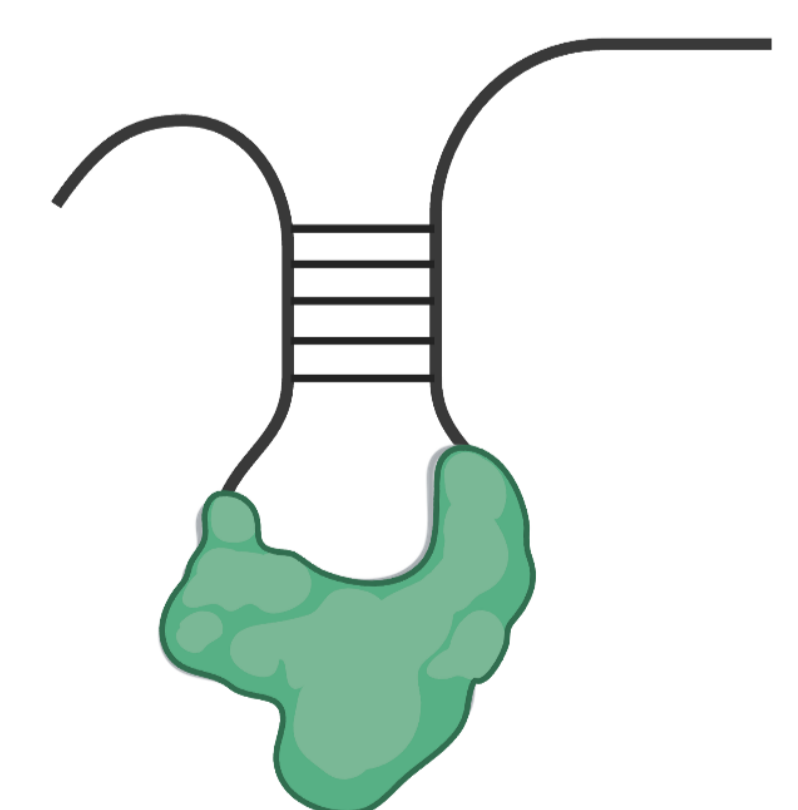
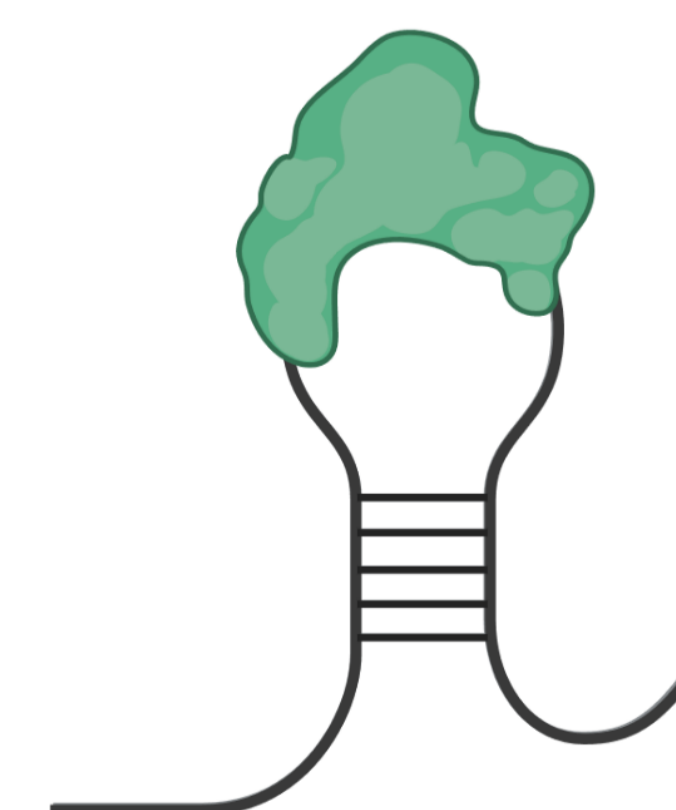
## 5 – Validation of RNA-dependent protein-protein interactions



## 6 – The concept of riboregulation

RBPs regulate the fate of RNA

RNA regulates the fate of RBPs  
"Riboregulation"



- Transcription
- Splicing
- Degradation
- Translation

- **Function**
- **Interaction**
- Localization
- Conformation

Functional and Structural Genomics



## References

1. Caudron-Herger, M. et al. R-DeeP. Proteome-wide and Quantitative Identification of RNA-Dependent Proteins by Density Gradient Ultracentrifugation. *Mol Cell* 75, 184–199.e10 (2019).
2. Caudron-Herger, M. et al. Identification, quantification and bioinformatic analysis of RNA-dependent proteins by RNase treatment and density gradient ultracentrifugation using R-DeeP. *Nat Protoc* 15, 1338–1370 (2020).

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