



# **VIROLOGIA**

## **GENOMAS VIRAIS**

### **(Funcionalidades)**



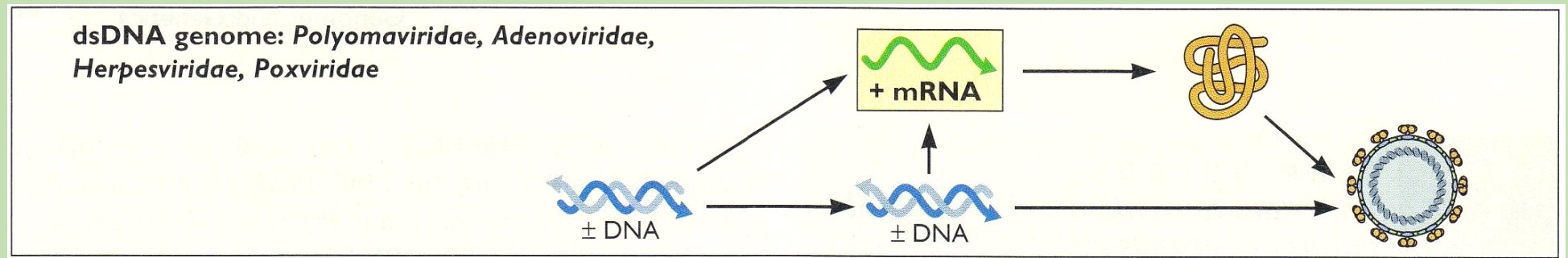
# Estratégias de expressão

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- Vírus a DNA
  - dsDNA
  - ssDNA
- Vírus a RNA
  - dsRNA
  - ssRNA(+)
  - ssRNA(-)
  - ssRNA ambisenso
- Vírus a DNA/RNA
  - Retrovirus
  - Vírus Hepadna

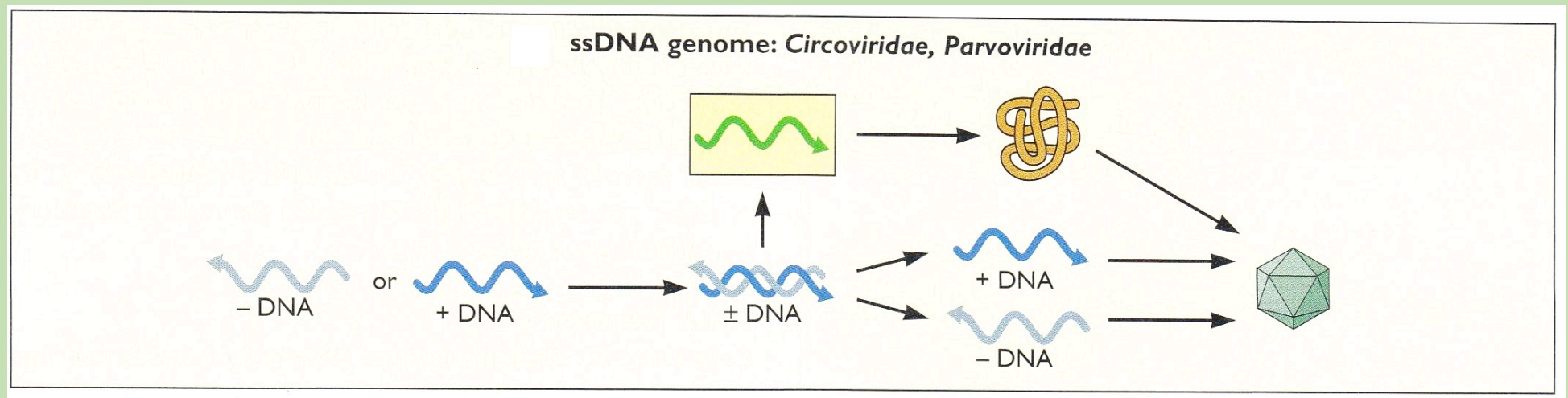


# dsDNA



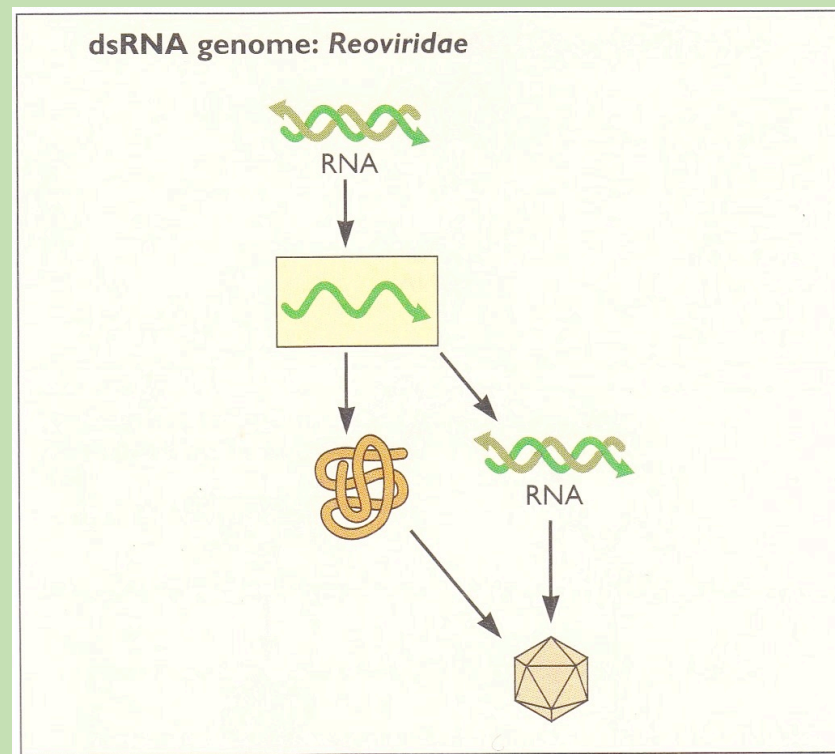


# ssDNA



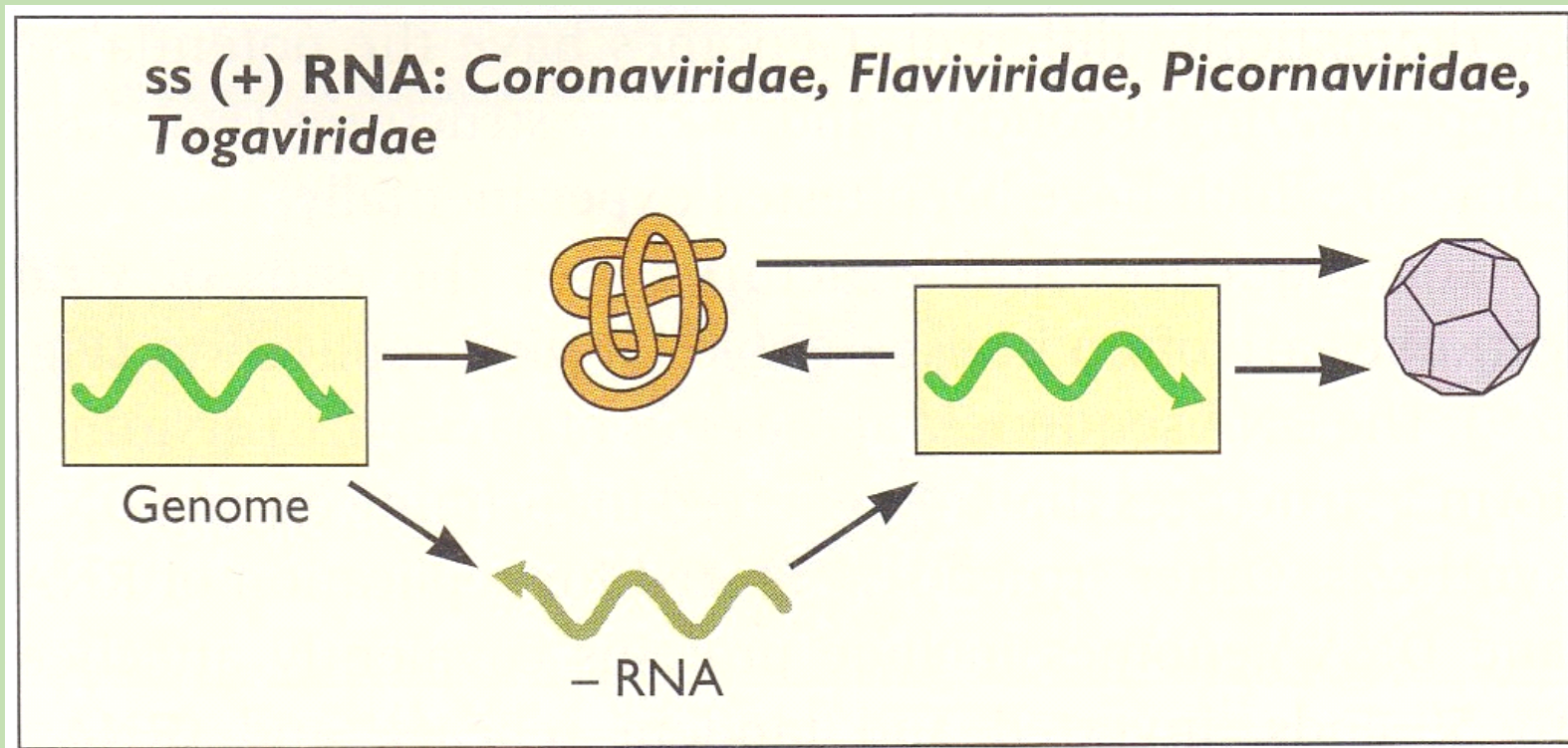


# dsRNA



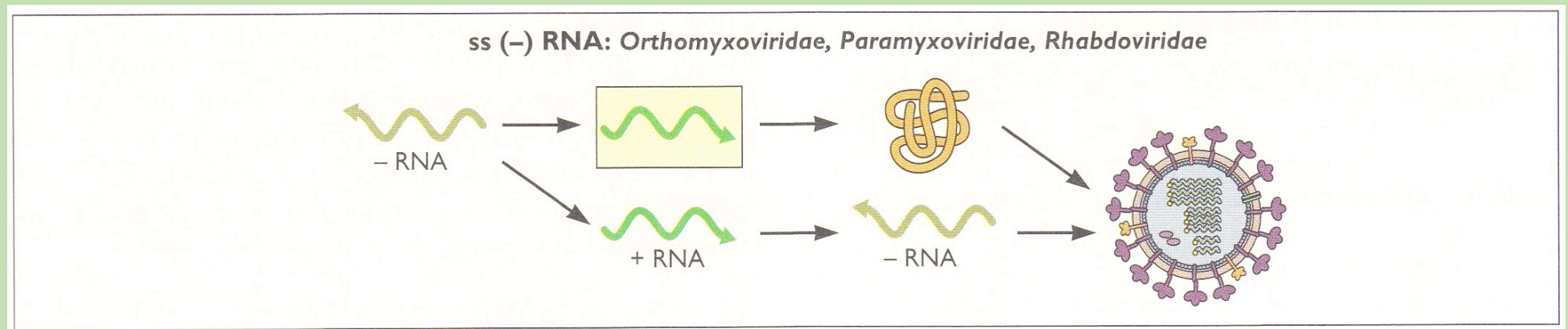


# ssRNA(+)



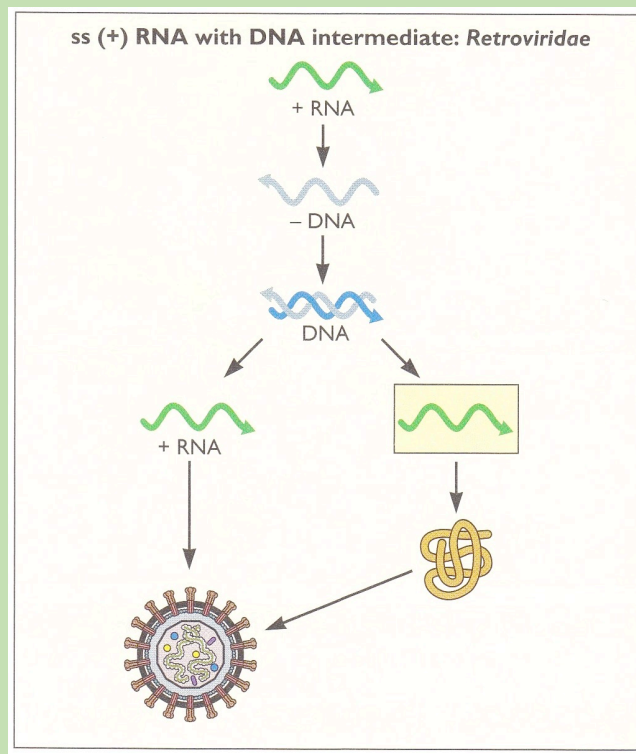


# ssRNA(-)





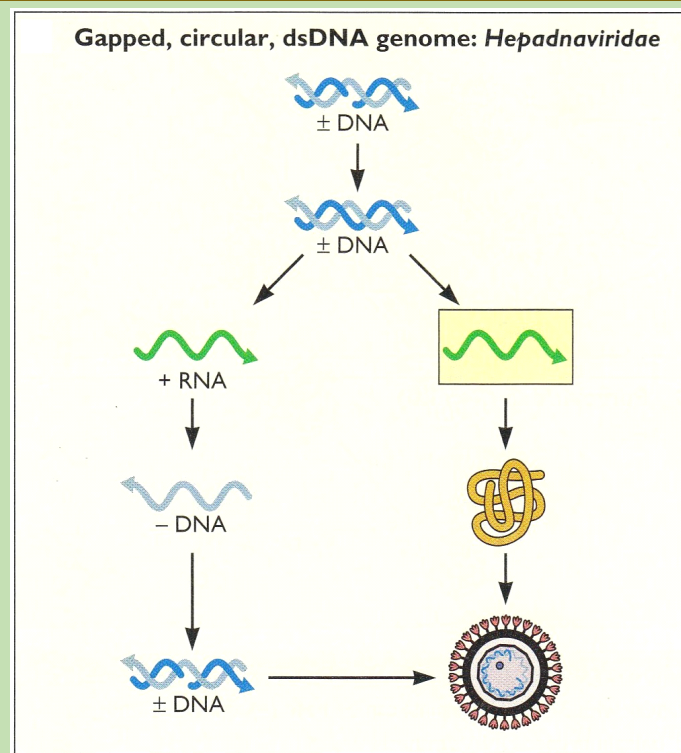
# ssRNA(+)/DNA







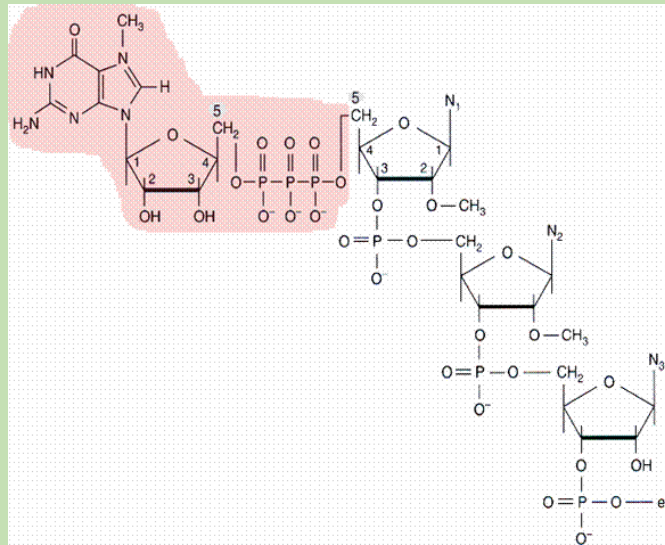
# DNA gap / RNA





# 5'-cap

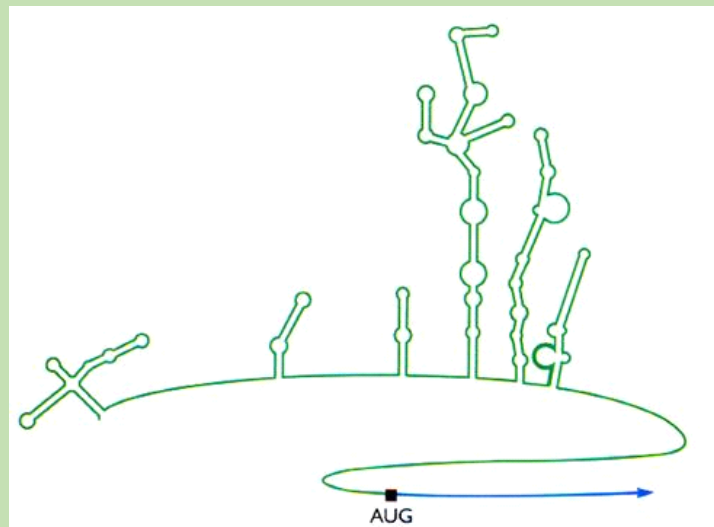
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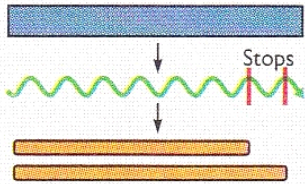
# IRES – Internal Ribosomal Entry Site

| Mechanism | Diagram                                 | Virus                                        |
|-----------|-----------------------------------------|----------------------------------------------|
| IRES      | <p>Viral gene<br/>mRNA<br/>Proteins</p> | <i>Flaviviridae</i><br><i>Picornaviridae</i> |





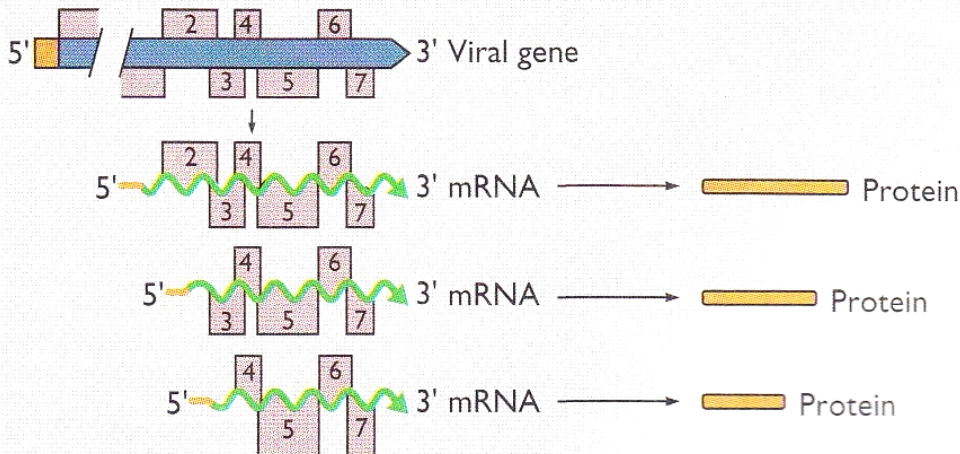
# Supressão da terminação

| Mechanism                  | Diagram                                                                                                                           | Virus                               |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Suppression of termination |  <p>Viral gene</p> <p>mRNA</p> <p>Proteins</p> | Alphaviruses<br><i>Retroviridae</i> |





# Sobreposição de sequências

| Mechanism    | Diagram                                                                             | Virus                                        |
|--------------|-------------------------------------------------------------------------------------|----------------------------------------------|
| Nested mRNAs |  | <i>Coronaviridae</i><br><i>Arteriviridae</i> |



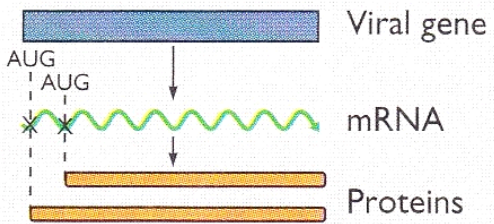
# Frameshift

| Mechanism               | Diagram                                                                                                                                      | Virus                                                              |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Ribosomal frameshifting | <p>Viral gene</p> <p>Frameshift site</p> <p>mRNA</p> <p>Upstream of frameshift site</p> <p>Downstream of frameshift site</p> <p>Proteins</p> | <i>Astroviridae</i><br><i>Coronaviridae</i><br><i>Retroviridae</i> |



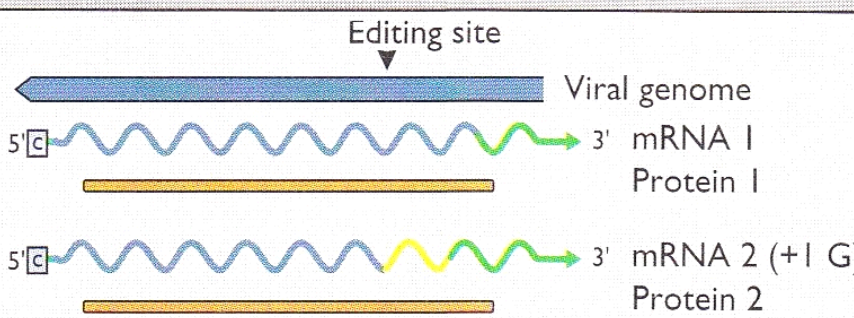


# AUG alternativos

| Mechanism      | Diagram                                                                             | Virus                                                                                             |
|----------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Leaky scanning |  | <i>Orthomyxoviridae</i><br><i>Paramyxoviridae</i><br><i>Polyomaviridae</i><br><i>Retroviridae</i> |



# Edição de RNA

| Mechanism   | Diagram                                                                             | Virus                                                                     |
|-------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| RNA editing |  | <i>Paramyxoviridae</i><br><i>Filoviridae</i><br>Hepatitis delta satellite |





# Splicing alternative

| Mechanism     | Diagram | Virus                                                                                  |
|---------------|---------|----------------------------------------------------------------------------------------|
| mRNA splicing |         | Adenoviridae<br>Orthomyxoviridae<br>Papillomaviridae<br>Polyomaviridae<br>Retroviridae |



# Poliproteína

| Mechanism             | Diagram                                                            | Virus                                                          |
|-----------------------|--------------------------------------------------------------------|----------------------------------------------------------------|
| Polyprotein synthesis | <p>Viral gene</p> <p>mRNA</p> <p>Polyprotein</p> <p>Processing</p> | Alphaviruses<br>Flaviviridae<br>Picornaviridae<br>Retroviridae |



# Particularidades na expressão

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- IRES
- AUG alternativos
- Splicing alternativo
- Poliproteínas
- Edição de RNAs
- Supressão de terminação
- Grelha de leitura alternativa
- ORF sobrepostas
- ....