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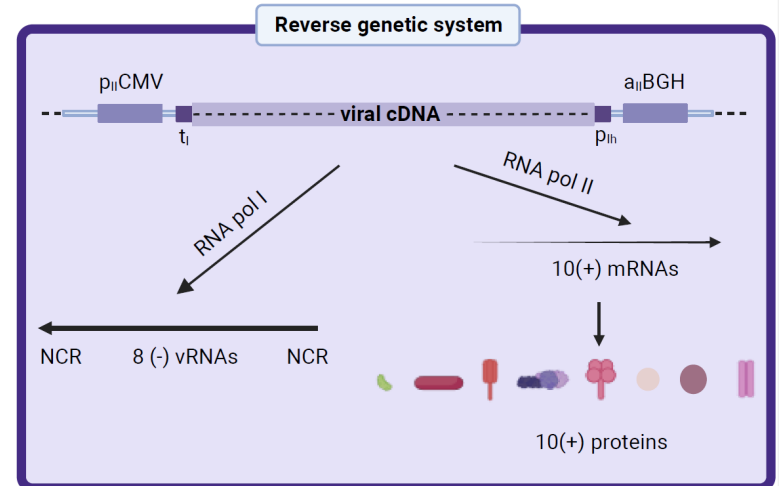
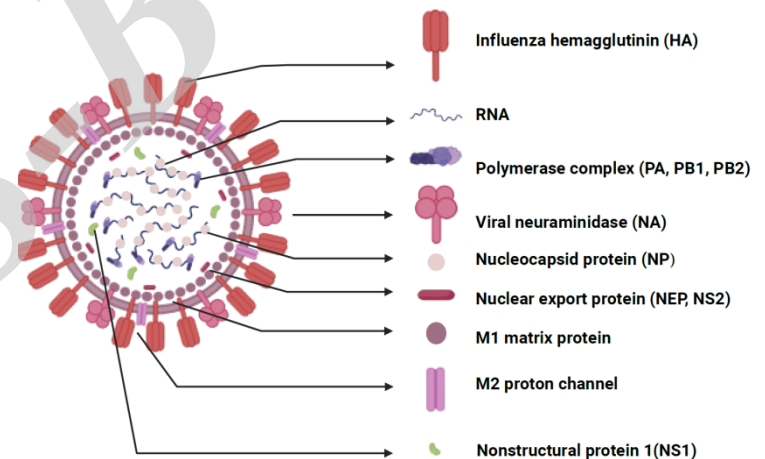
New characteristics of cancer immunotherapy: trends in viral tumor immunotherapy with influenza virus-based approaches

Key words: Oncolytic virus, Influenza A virus, Antitumor, Reverse genetic technology, Vaccine, Viral immunotherapy

Research Summary

This review mainly focused on the use of influenza virus in cancer immunotherapy, and provide insights essential for refining influenza A virus-based viral tumor immunotherapies in the following aspects:

- Expression of proteases and increased spread in the tumor
- Expression of cytokines
- Expression of tumor-associated antigens (TAA) and immune responses initiation
- Expression of ICIs drugs



Innovation points

- **Introduction** of the various forms of influenza viruses and their applications in cancer immunotherapy, with a focus on their advantages and challenges.
- **Summary** of the most updated research progress about methods and effects of engineering flu viruses through genetic Modification, with a focus on their advantages and challenges.
- **Insights** for optimizing viral tumor immunotherapy based on influenza A virus.

Influenza A virus for tumor immunotherapy

- Life competent influenza virus
- Attenuated IAV vaccine
- Inactivated IAV vaccine

Combinational therapy of IAV viral immunotherapy

- Immune checkpoint blockade
 - Cytokines
- Cytotoxic drugs
- Radiotherapy

Armed influenza viruses

- Tumor-associated antigen
 - Cytokines
 - Proteases
- Monoclonal antibody drugs