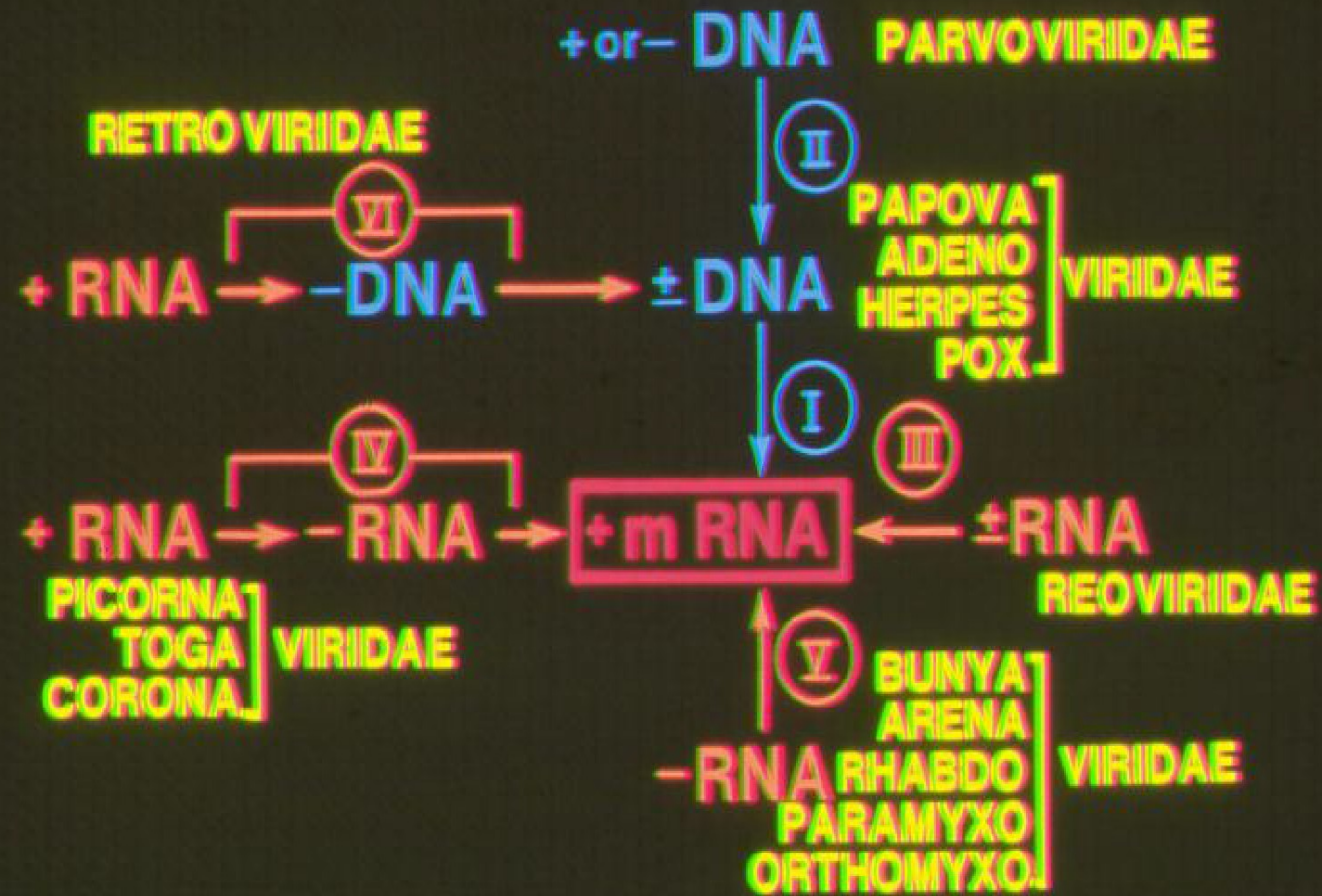


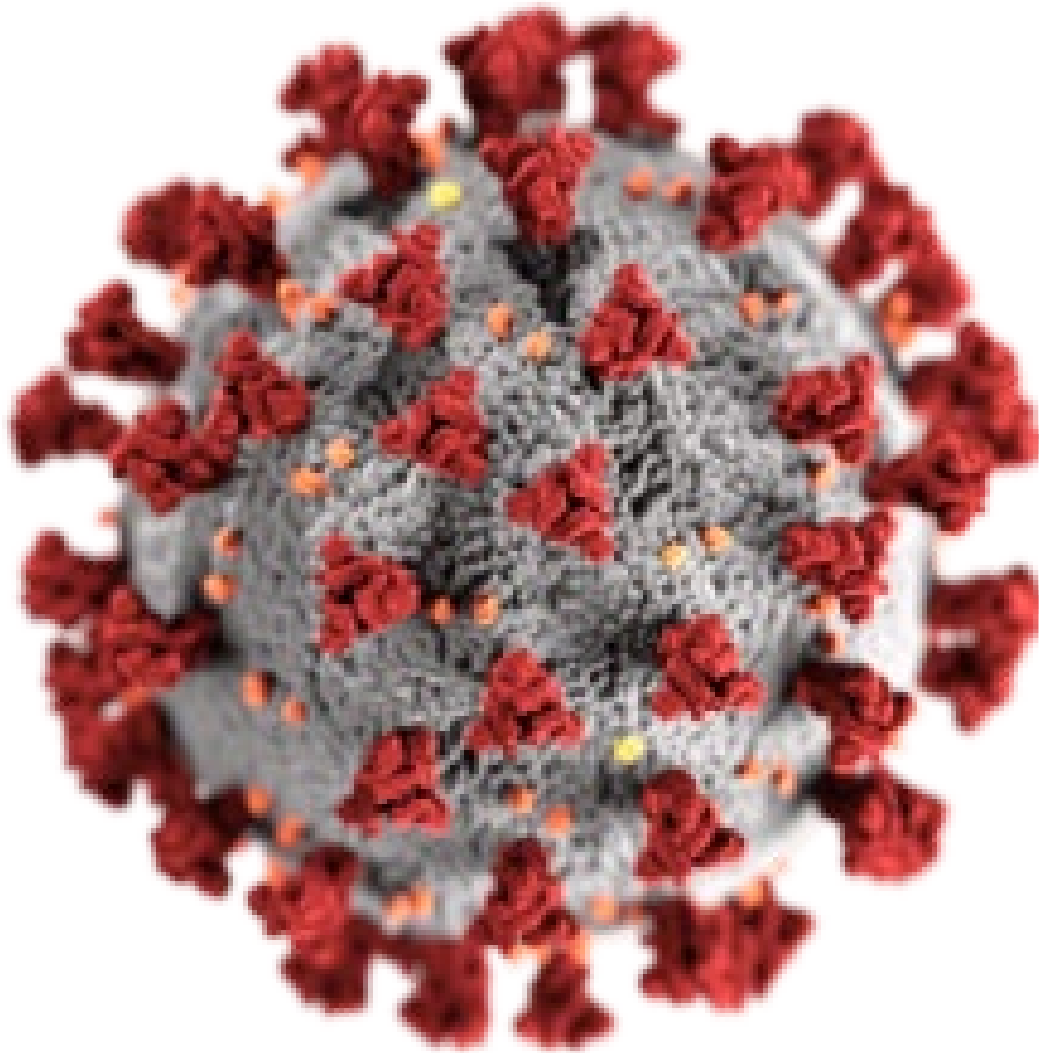
SARS CoV-2



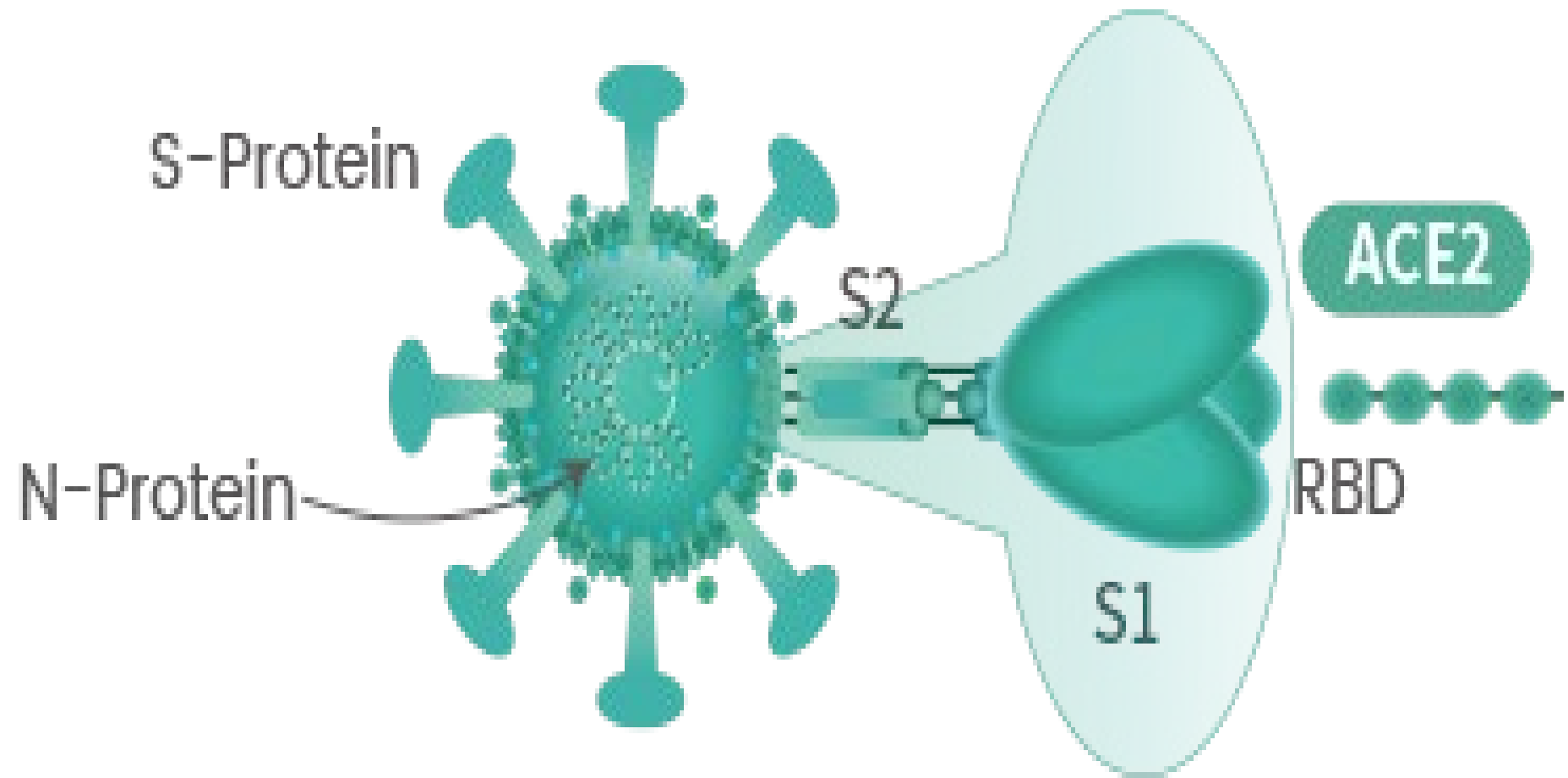
Coronavirus: An Overview

- An Example of An “Emerging Disease”
- Molecular Level Research Has Been Conducted On CoV For Over 40 Years
- Coronavirus Genome Is A Positive Polarity RNA and Has a Larger Overall Length Compared To Other RNA Viruses (Polio, Influenza, Rabies, etc)
- Large Size RNA Genome Equates To Large Protein Coding Capacity, 24 Proteins

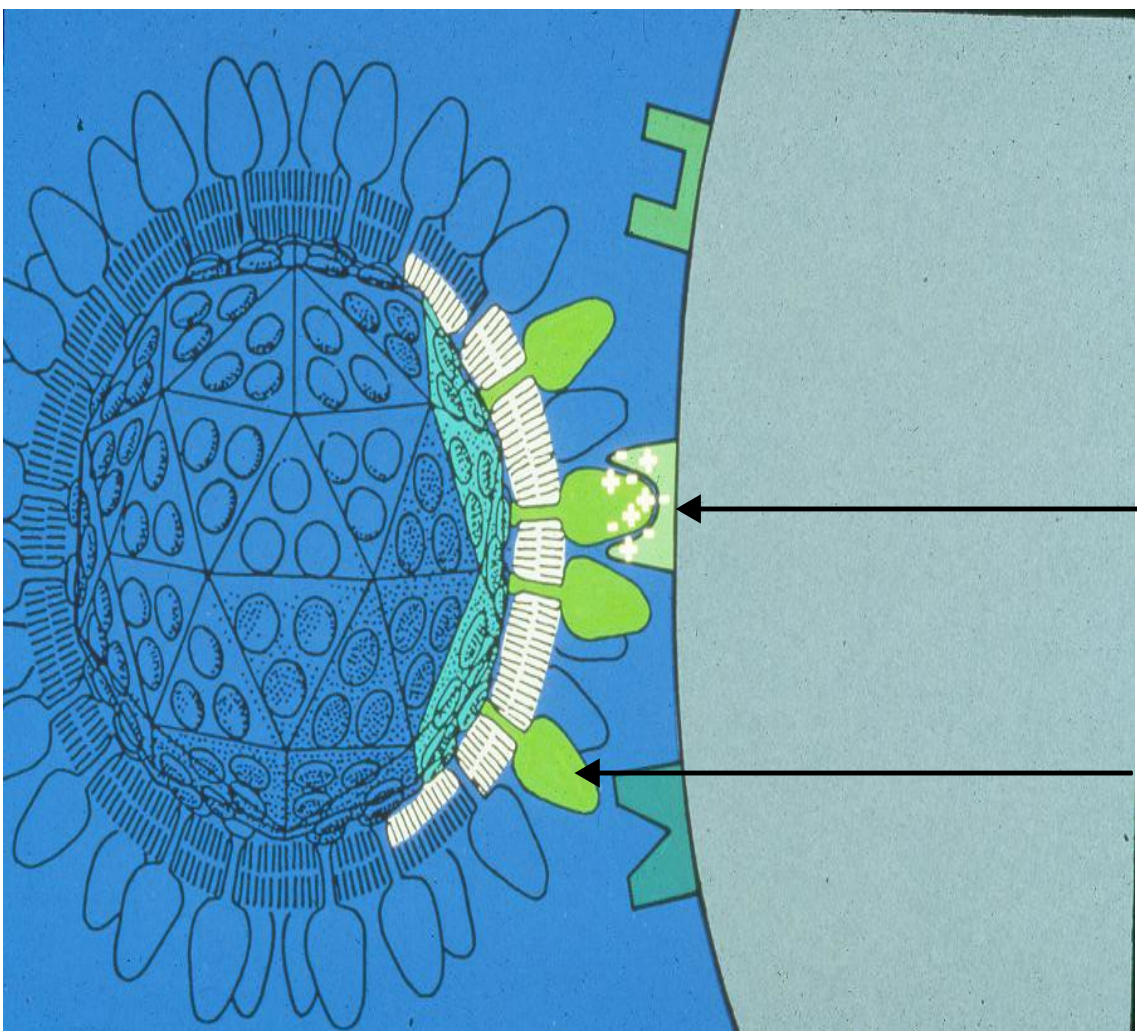
Spike Proteins



<https://phil.cdc.gov/Details.aspx?pid=23312>

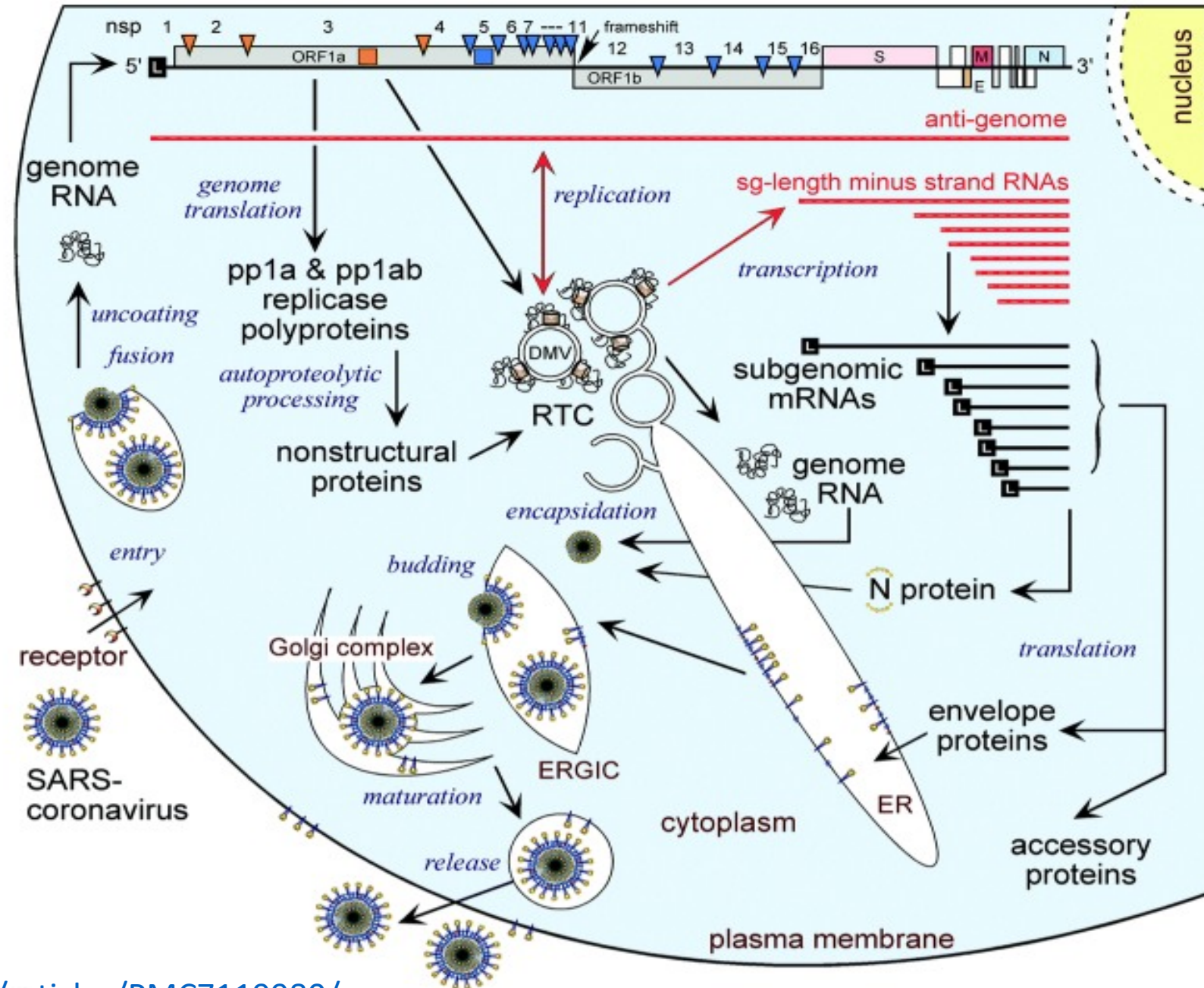


<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7291026/>

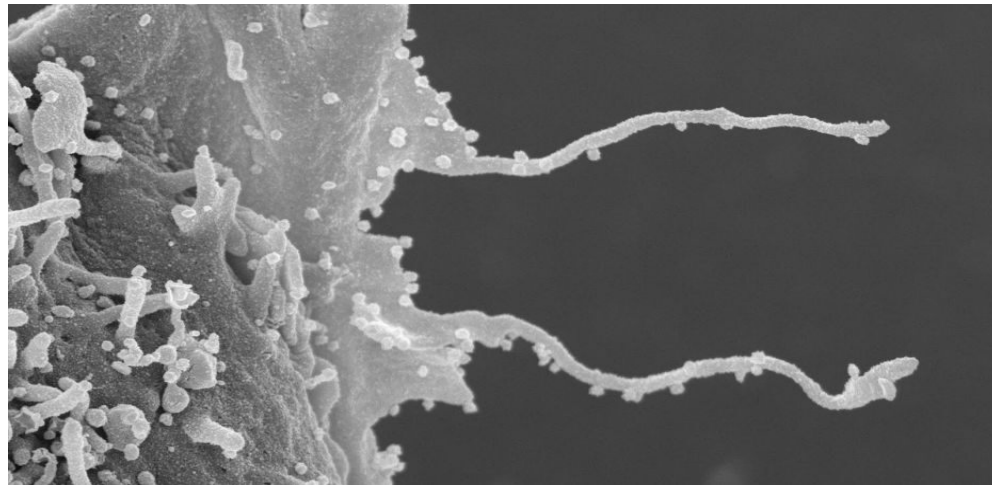


- S1 Component Of Spike Protein Possesses Receptor Binding Domain (RBD)
- S2 Component Mediates Entry Of Virus Into Cell Via Fusion Between Virus Envelop and Cell Membrane
- S Protein is The Antigenic Component In Vaccines Or mRNA Vaccine Encodes S Protein To Yield Immunity

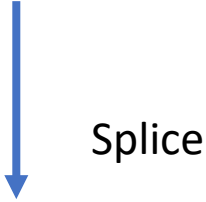
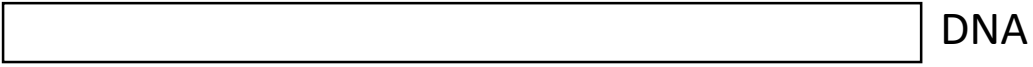
(a)



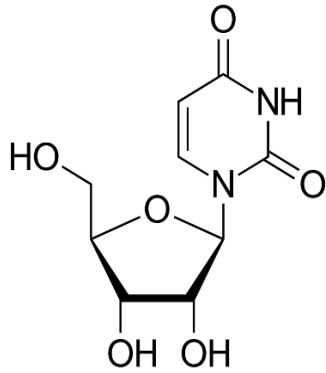
(b)



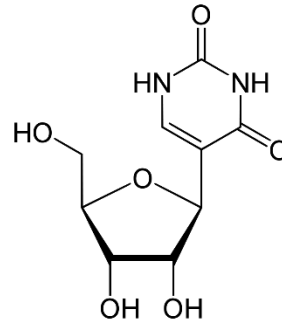
<http://www.sci-news.com/medicine/sars-cov-2-coronavirus-filopodia-08584.html>



mRNA Modification



Uridine



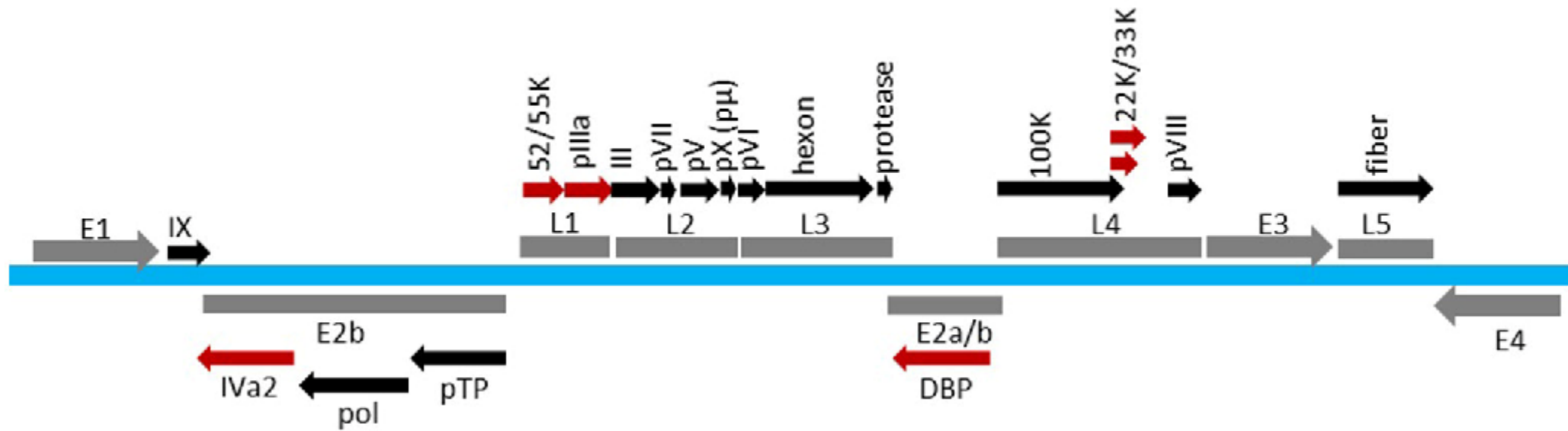
pseudouridine

mRNA Modifications

- Enhance mRNA Stability and Translation Efficiency
 - Adjust ribonucleotide sequence in 5' and 3' untranslated regions
 - Choose the optimal length of polyA
 - Remove and replace rare codons
 - Choose best cap structure
- Limit the Activation of Innate Response (degradation of RNA)
 - Replace uridine with pseudo-uridine Ψ or methylated derivative of pseudo-uridine ($m1\Psi$)
 - Purify mRNA mod via HPLC or FPLC which removes double stranded RNA

Adenovirus Vectors: The Other Vaccine

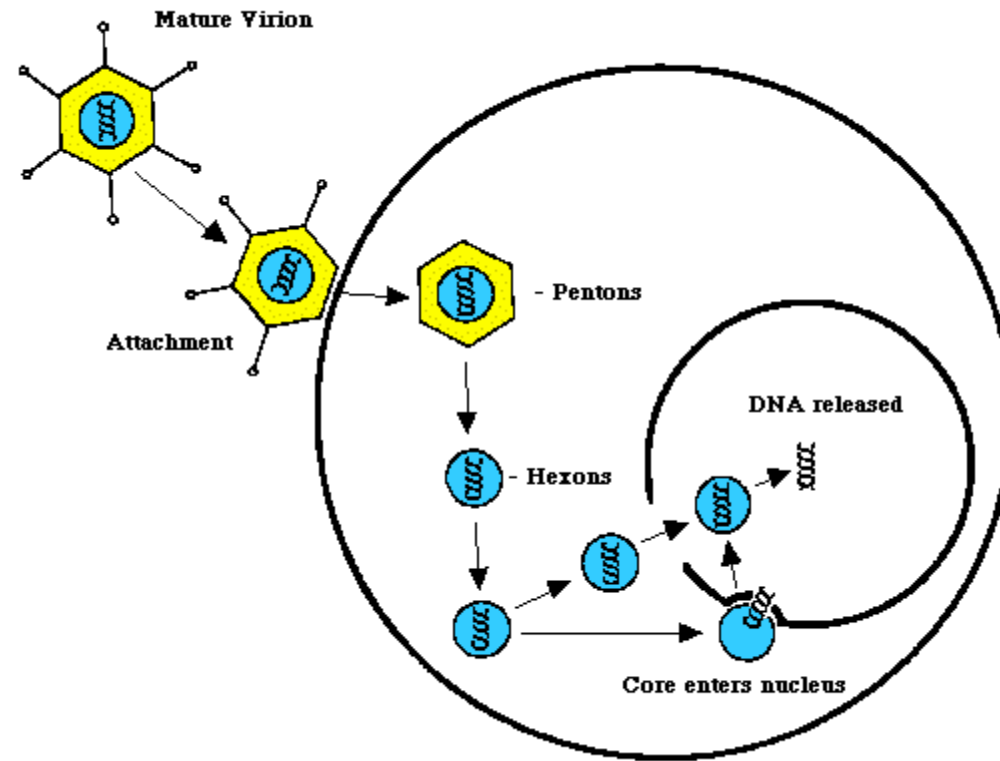
- 51 Types of Human Adenoviruses
- Most Individuals Are Infected By Multiple Types Over A Lifetime
- Older Individuals Have Antibodies To More Types
- Adenovirus Type Common In A Human Populations Will Generate Neutralizing Antibodies That Could Minimize An Adenovirus Vaccine Vector Of The Same or Related Types
- Chimpanzee Adenovirus Vector
- Ad 26 Vector, Not Seen In Most Human Populations



Published in Front. Microbiol. 2016

Components of Adenovirus Genome

Packaging Yadvinder S. Ahi, S. Mittal



<https://web.archive.org/web/20130420102446/http://www.microbiologybytes.com/virology/Adenoviruses.html>

Healthcare: Cybertarget In The Age Of COVID

Corporate Espionage , Theft Of Proprietary Vaccine Formulations

Healthcare Information, A Valuable Commodity

Theft Of COVID Vaccines, For Sale On The Dark Net

Counterfeit Vaccines

Ransom For Encrypted Health Data

