

VIROLOGIA 2006/2007

APRESENTAÇÕES 8 e 9

**(VÍRUS COM ESTRATÉGIA
DE EXPRESSÃO AMBISSENSE)**

Maria Filomena Caeiro

NONSEGMENTED

RHABDOVIRIDAE

Vesiculovirus (VSV)

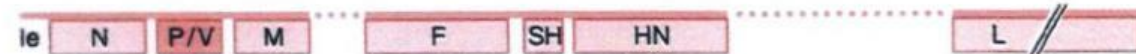


Lyssavirus (IHNV)



PARAMYXOVIRIDAE

Paramyxovirus (SV5)



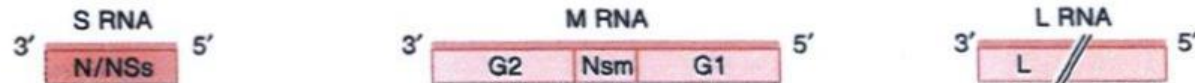
Pneumovirus (RSV)



SEGMENTED

BUNYAVIRIDAE

Bunyavirus (SSH)



Phlebovirus (UUK)



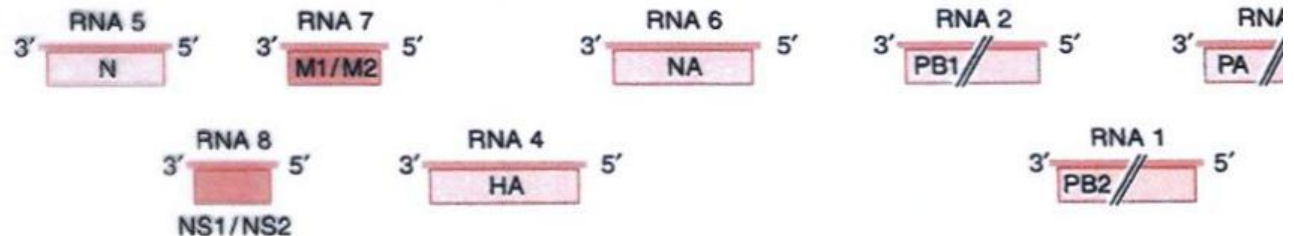
ARENAVIRIDAE

Arenavirus (LCM)



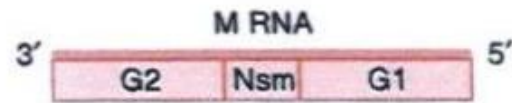
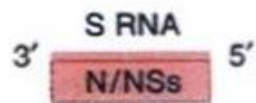
ORTHOMYXOVIRIDAE

Influenzavirus

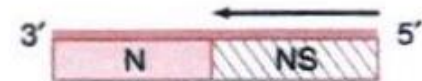


BUNYAVIRIDAE

Bunyavirus (SSH)

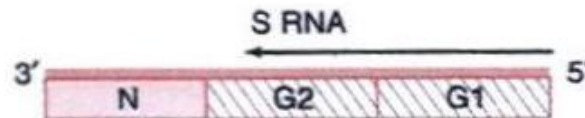


Phlebovirus (UUK)



ARENAVIRIDAE

Arenavirus (LCM)

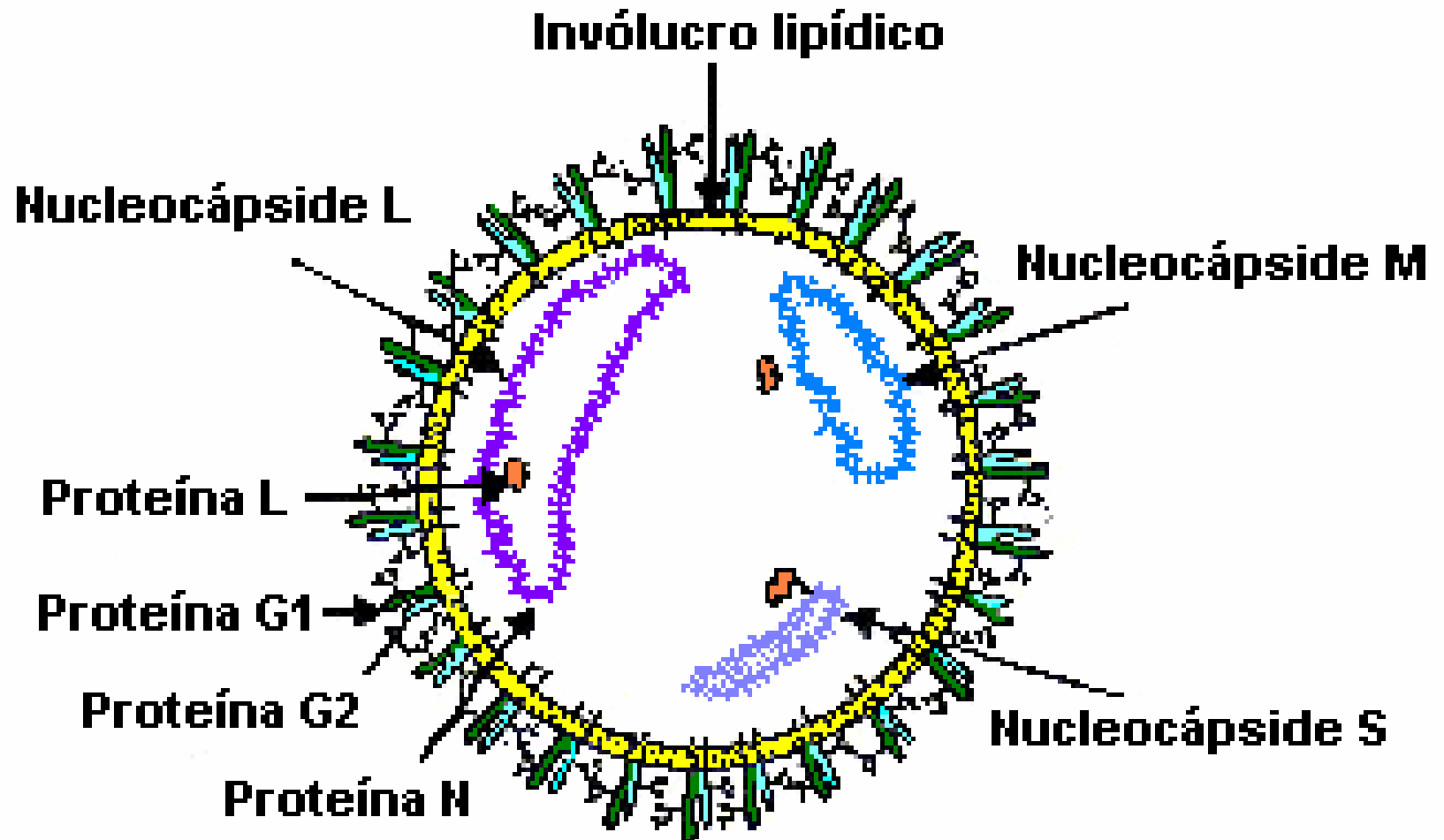


Singer, M. and Berg, P. (1997).
"Exploring Genetic Mechanisms".
University Science Books. Sausalito,
California.

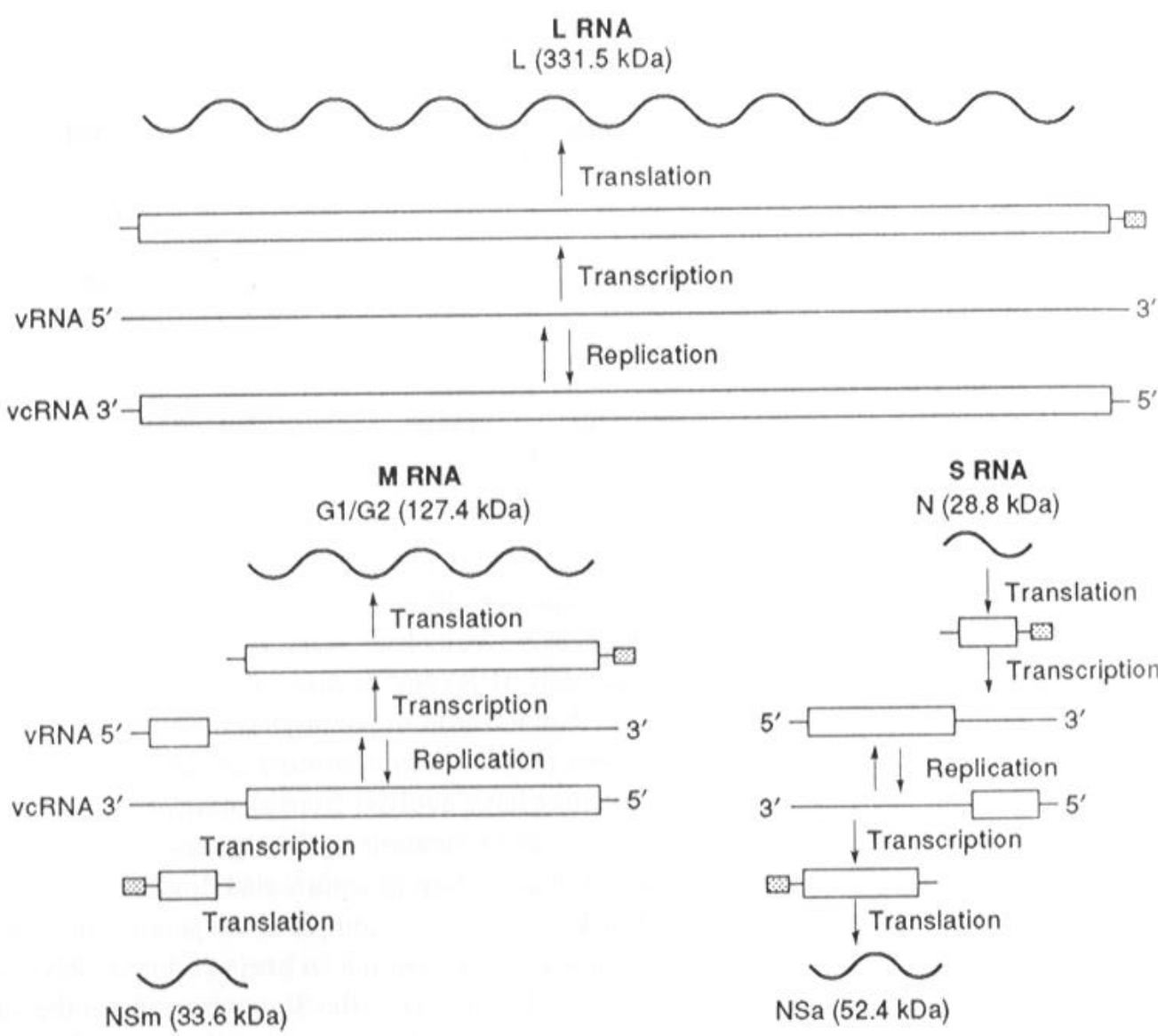
Bunyaviridae:

- *Bunyavirus*
- *Hantavirus*
- *Phlebovirus*
- *Nairovirus*
- *Uukuvirus*
- *Tospovirus* (vírus de plantas)

Bunyaviridae



Genome structure and expression strategy of TSWV (isolate BR-01). Open reading frames are indicated as open bars, and the hatched boxes at the 5' ends of mRNAs represent nonviral leader sequences. (Courtesy of R. W. Goldbach)



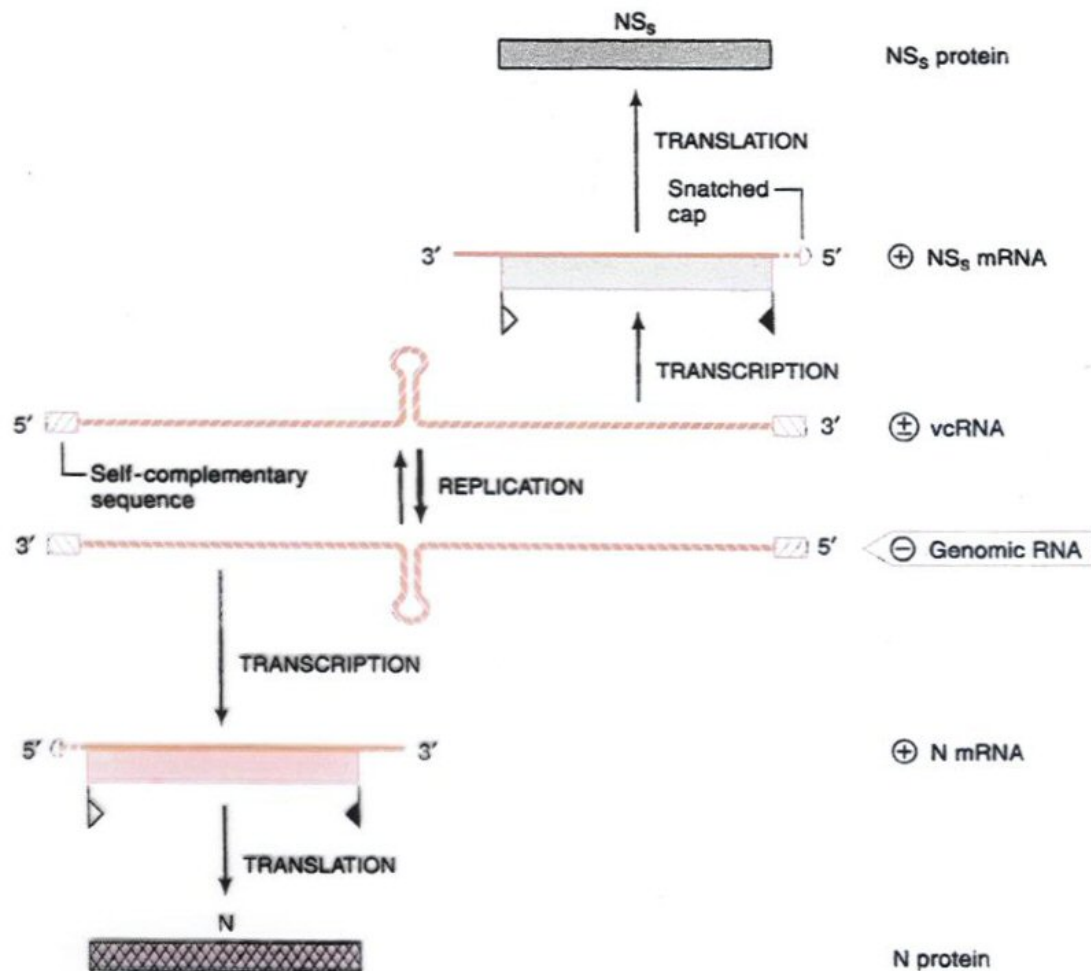
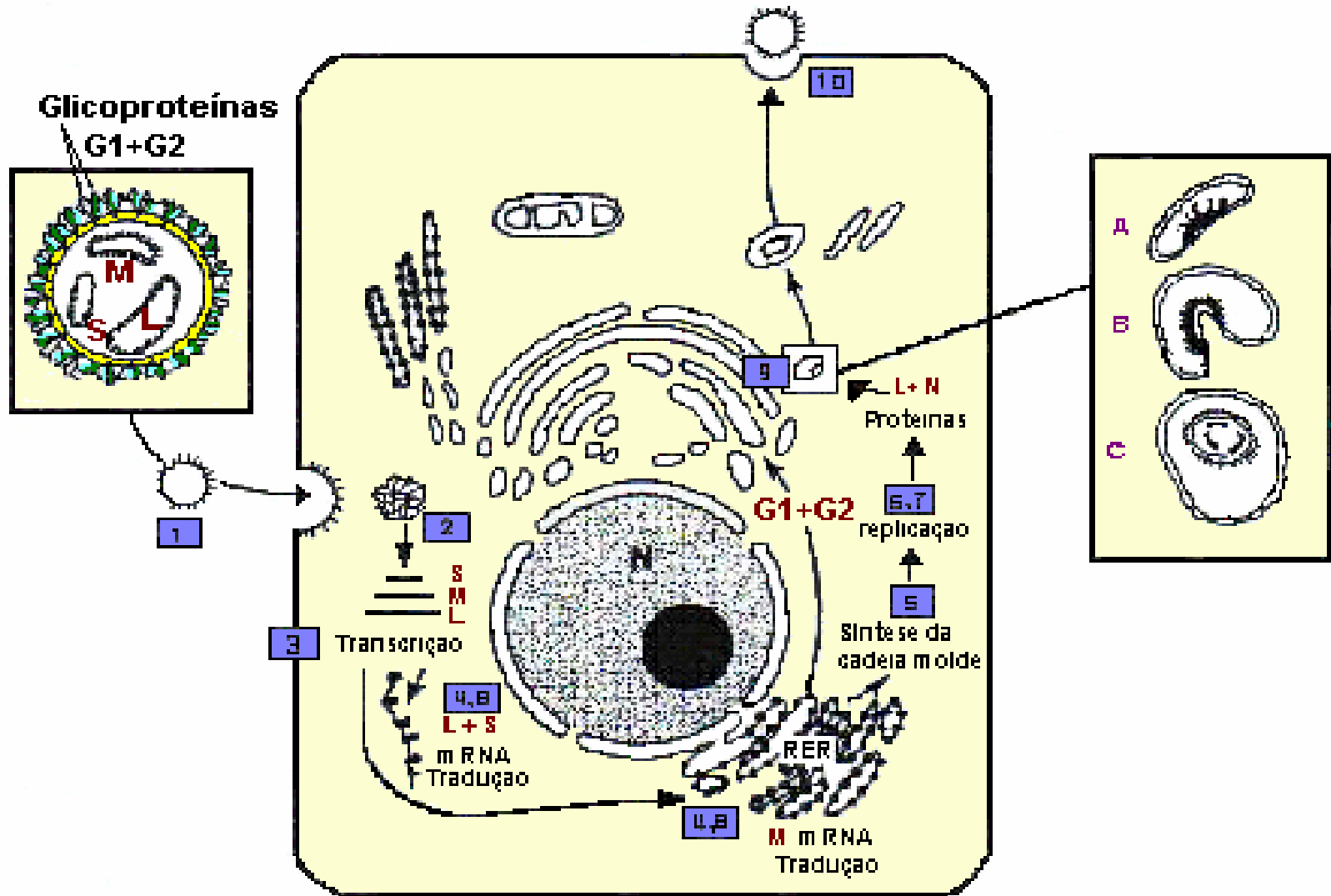


Figure 2.18

Ambisense transcription and translation strategy of the S RNA of a phlebovirus. The genomic RNA and the vcRNA are neither plus- nor minus-strand and therefore are shown as diagonally hatched dark-color lines. The plus-strand mRNAs are shown as solid dark-color lines. The 5' caps (open symbols) and a few nucleotides at the 5' ends (dashed lines) are derived from cellular mRNAs. The N mRNA that encodes the N protein (cross-hatched because it is a virion protein) is transcribed from the virion RNA itself. The NS_s mRNA is transcribed from the vcRNA. Both transcripts terminate at a hairpin structure between the two ORFs. The diagonally hatched boxes at the ends of the genomic and vcRNA are self-complementary sequences not present in mRNAs.

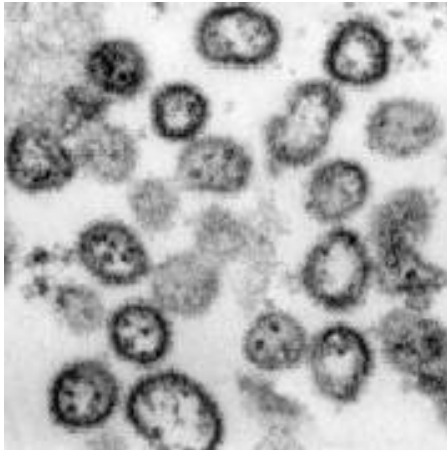
Singer, M. and Berg, P. (1997).
"Exploring Genetic Mechanisms".
University Science Books. Sausalito,
California.

Bunyaviridae – Ciclo replicativo



N- núcleo; RER- retículo endoplasmático rugoso

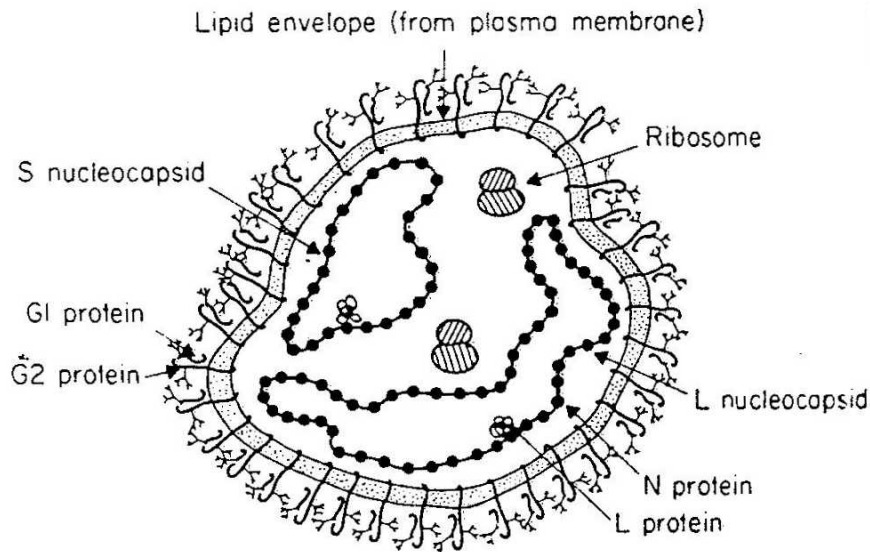
Arenaviridae



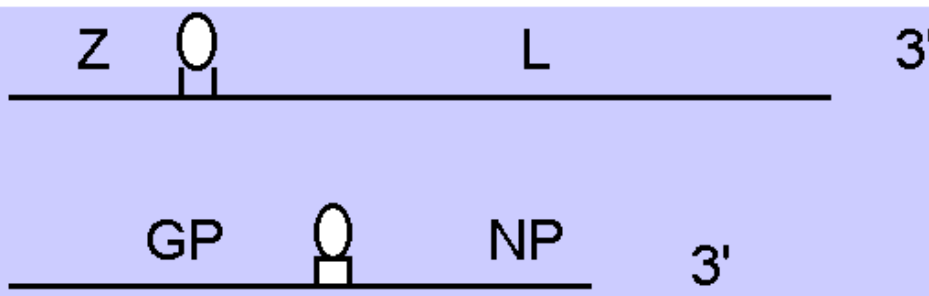
Vírus	Distribution	Principal vertebrate host
Old World species		
LCM	Virtually worldwide	- <i>Mus musculus</i>
Lassa	West Africa	- <i>Mastomys natalensis</i>
Ippy	Central African Republic	- <i>Arvicanthis</i> species
		- <i>Praomys</i> species
Mobala	Central African Republic	- <i>Praomys jacksoni</i>
Mopeia	Mozambique	- <i>Mastomys natalensis</i>
New World species: Tacaribe complex		
Amapari	Brazil	- <i>Oryzomys</i> species
		- <i>Neacomys guianae</i>
Flexal	Brazil	- <i>Oryzomys</i> species
Junin	Argentina	- <i>Calomys laucha</i>
		- <i>Mus musculus</i>
		- <i>Akodon arenicola</i>
		- <i>Calomys callosus</i>
Latino	Bolivia	- <i>Calomys callosus</i>
Machupo	Bolivia	- <i>Oryzomys buccinatus</i>
Parana	Paraguay	- <i>Oryzomys albigularis</i>
Pichinde	Colombia	- <i>Thomasomys fuscatus</i>
Tacaribe	Trinidad	- <i>Artibeus lituratus</i>
		- <i>Artibeus jamaicensis</i>
Tamiami	Florida	- <i>Sigmodon hispidus</i>
		- <i>Oryzomys palustris</i>

- Ribossomas do hospedeiro observados dentro do invólucro: “arena”, latim para arenoso.
- Virião pleomórfico com 50-300nm de diâmetro.
- Vírus de ssRNA com invólucro.
- Genoma constituído por 2 segmentos de ssRNA ambisense.
- Zoonóticos: hospedeiros naturais são animais.
- 23 espécies das quais 6 são patogénicas para humanos.

Vírus da Febre de Lassa

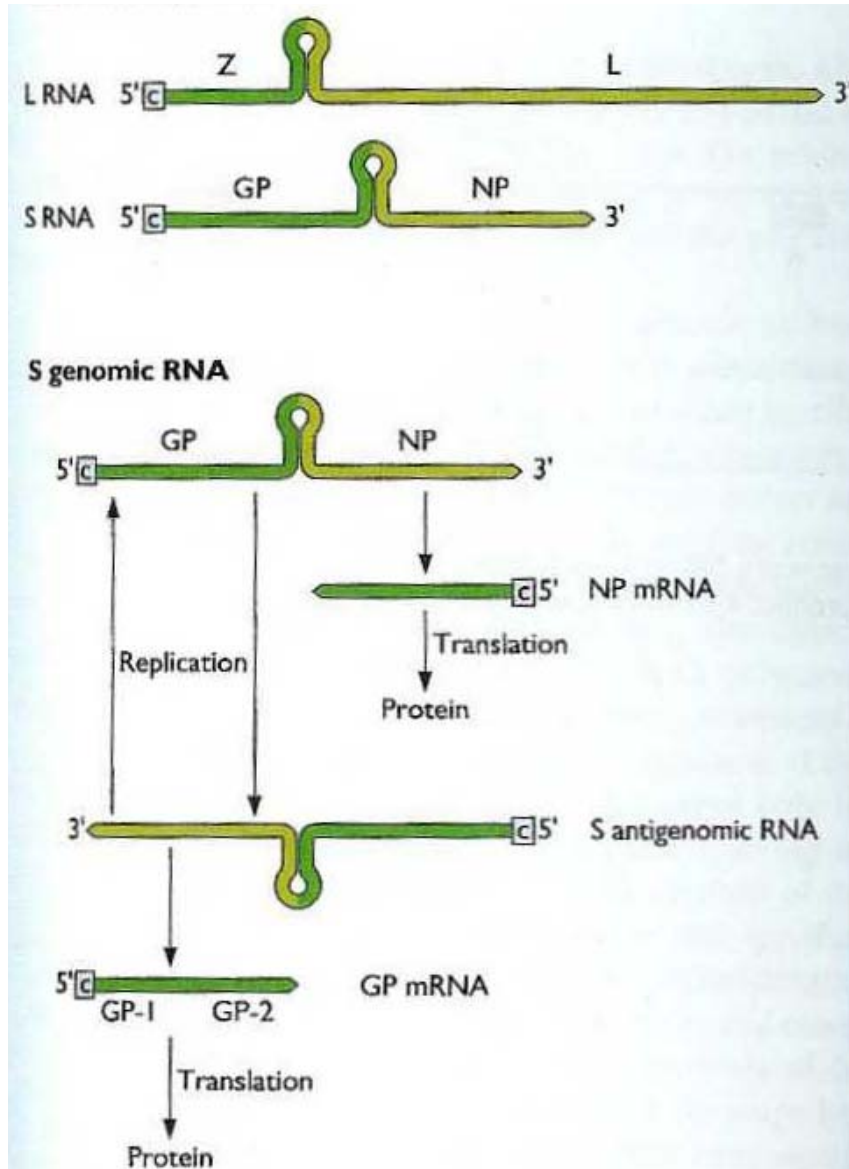


- **Invólucro lipídico com espículas (glicoproteínas GP1 e GP2).**
- **2 segmentos de ssRNA associados com a proteína da nucleocápside.**
- **Ribossomas.**
- **Polimerase de RNA.**



- **Genoma consiste em 2 segmentos de ssRNA ambisense: L (7,2kb) e S (3,4kb).**
- **Cada segmento tem 2 genes não-sobreponíveis:**
 - L tem genes Z e L;
 - S tem genes GP e NP.

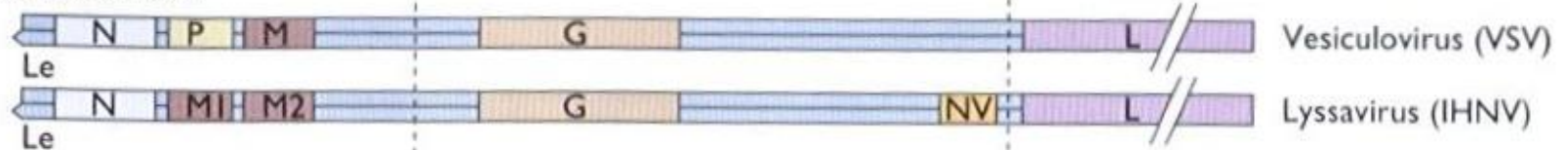
Arenaviridae – Expressão na célula hospedeira



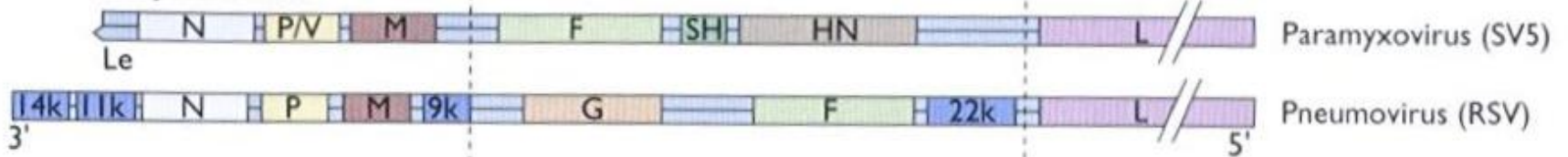
- **Interação GP1- receptor celular**
- **Fusão do invólucro com a membrana plasmática (GP2).**
- **Entrada da RNP no citoplasma.**
- **Síntese de mRNAs .**
- **Tradução dos mRNAs.**
- **Síntese de RNAs complementares**
- **Transcrição de mRNAs que codificam pré-GP e proteína Z.**
- **Síntese de RNAs genômicos**
- **Morfogénese da descendência viral**

Nonsegmented

Rhabdoviridae

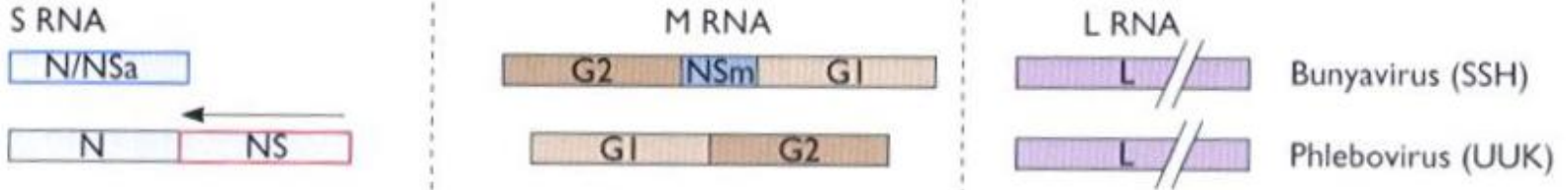


Paramyxoviridae



Segmented

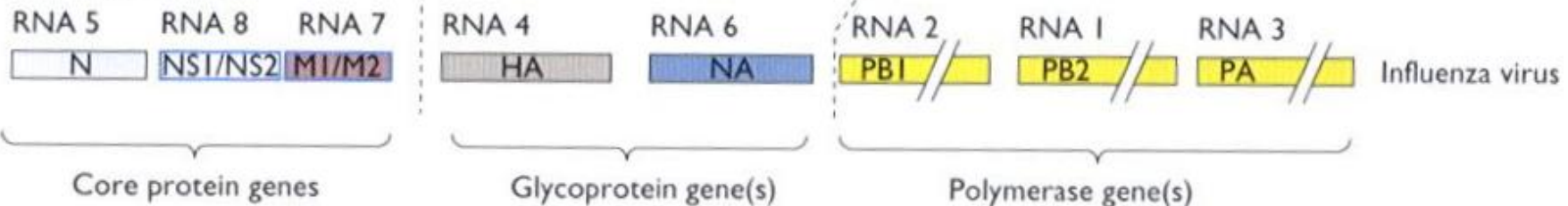
Bunyaviridae



Arenaviridae



Orthomyxoviridae



VIROLOGIA 2006/2007

APRESENTAÇÃO 9

**(VÍRUS COM GENOMA DE CADEIA
DUPLA DE RNA)**

Maria Filomena Caeiro

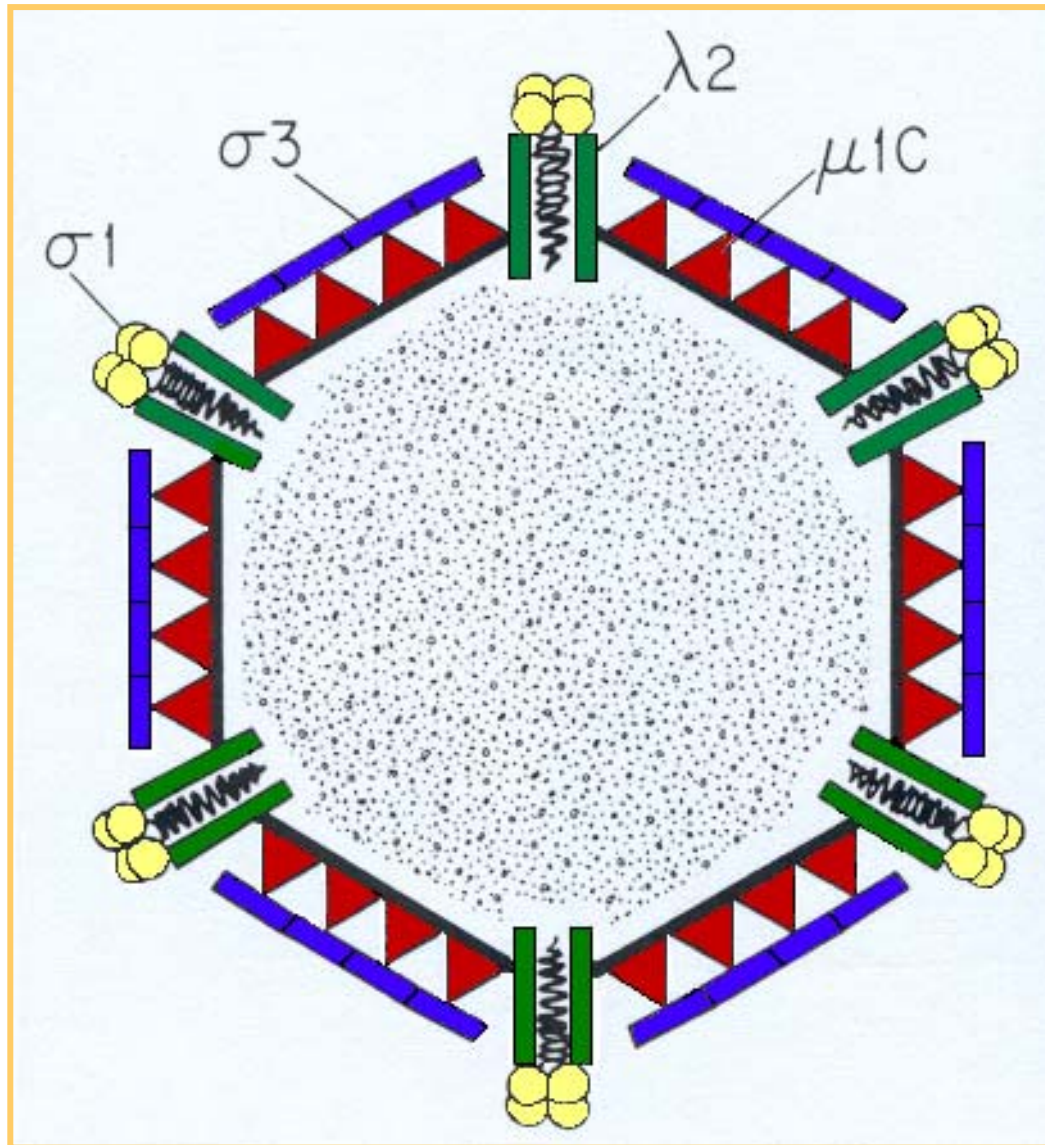
VÍRUS COM GENOMA DE dsRNA

- *Reoviridae*
- *Totiviridae*
- *Partitiviridae*
- *Birnaviridae*
- *Criptovirus*

Reoviridae

- Inicialmente classificados como Picornaviridae (1951-1959)
- Família “Reoviridae” (“respiratory enteric orphan virus”)
 - 9 géneros:
 - Orthoreovirus
 - Orbivirus
 - Rotavirus MAMÍFEROS
 - Coltivirus
 - Aquareovirus
 - Cypovirus – INVERTEBRADOS (insectos)
 - Phytoreovirus
 - Fijivirus PLANTAS
 - Oryzavirus
- 10 ou 12 segmentos genómicos
- Relativamente estáveis a uma vasta gama de pH, resistentes ao éter, clorofórmio e solventes lipídicos

Orthoreovirus - Virião



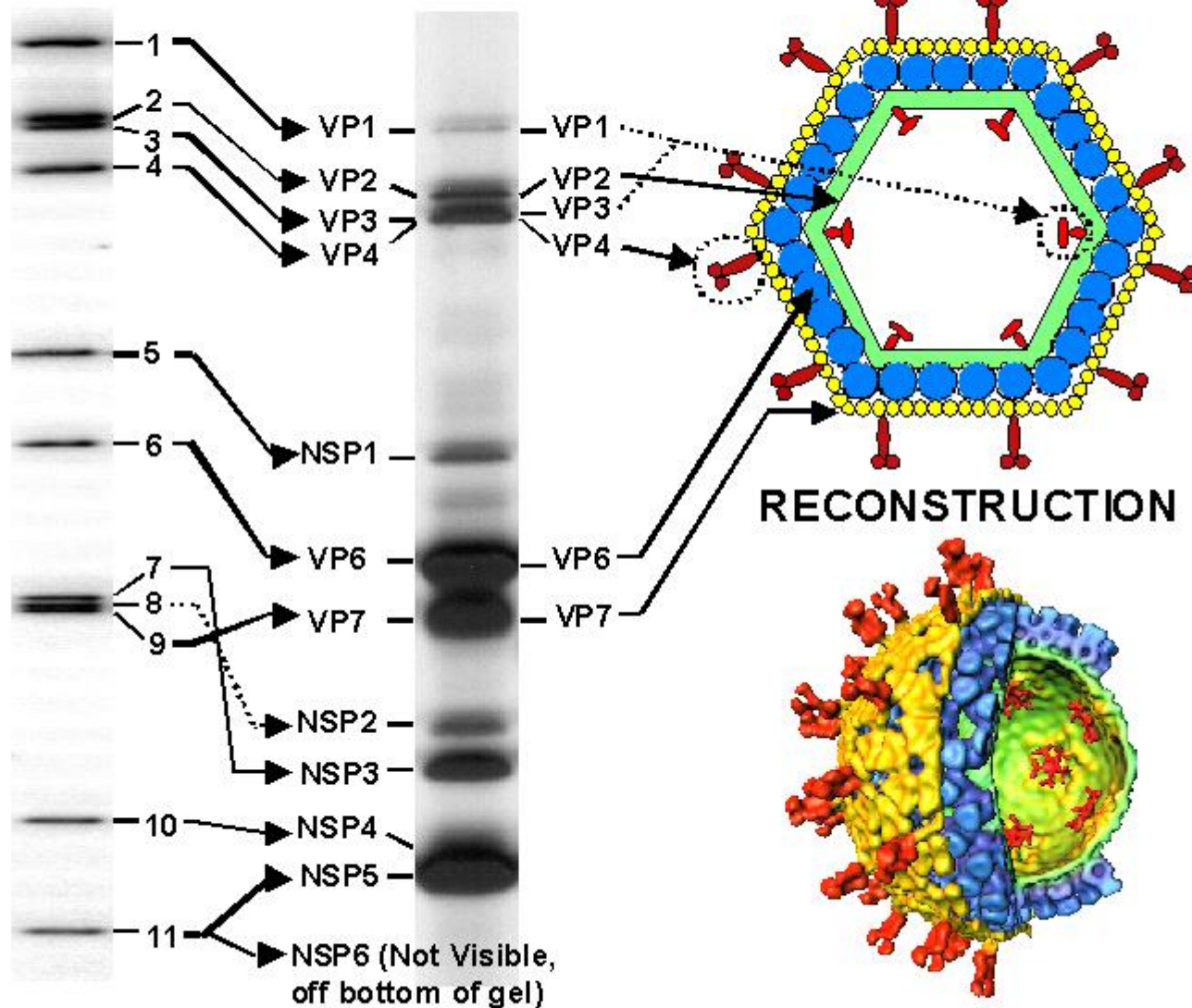
Genoma *Orthoreovirus*

Segemento Genómico	Tamanho (pb)	Proteína(s)	<i>Mr</i> (Kd)	Número aproximado de moléculas por partícula viral	Localização
L1	3854	$\lambda 3$	135	12	Cáp. interna
L2	3912	$\lambda 2$	140	60	Cáp. interna
L3	3901	$\lambda 1$	155	120	Cáp. interna
M1	2297	$\mu 2$	70	12	Cáp. interna
M2	2203	$\mu 1/\mu 1C$	80/72	20/700	Cáp. externa
M3	2240	μNS	75	—	Não estrutural
S1	1442	$\sigma 1/\sigma 1s$	42/12	48/ —	Cáp. externa/ Não estrutural
S2	1331	$\sigma 2$	38	180	Cáp. interna
S3	1198	σNS	36	—	Não estrutural
S4	1196	$\sigma 3$	34	720	Cáp. externa

GENOME SEGMENTS

ENCODED PROTEINS

VIRION SCHEMATIC (Protein Locations)



Ciclo Replicativo

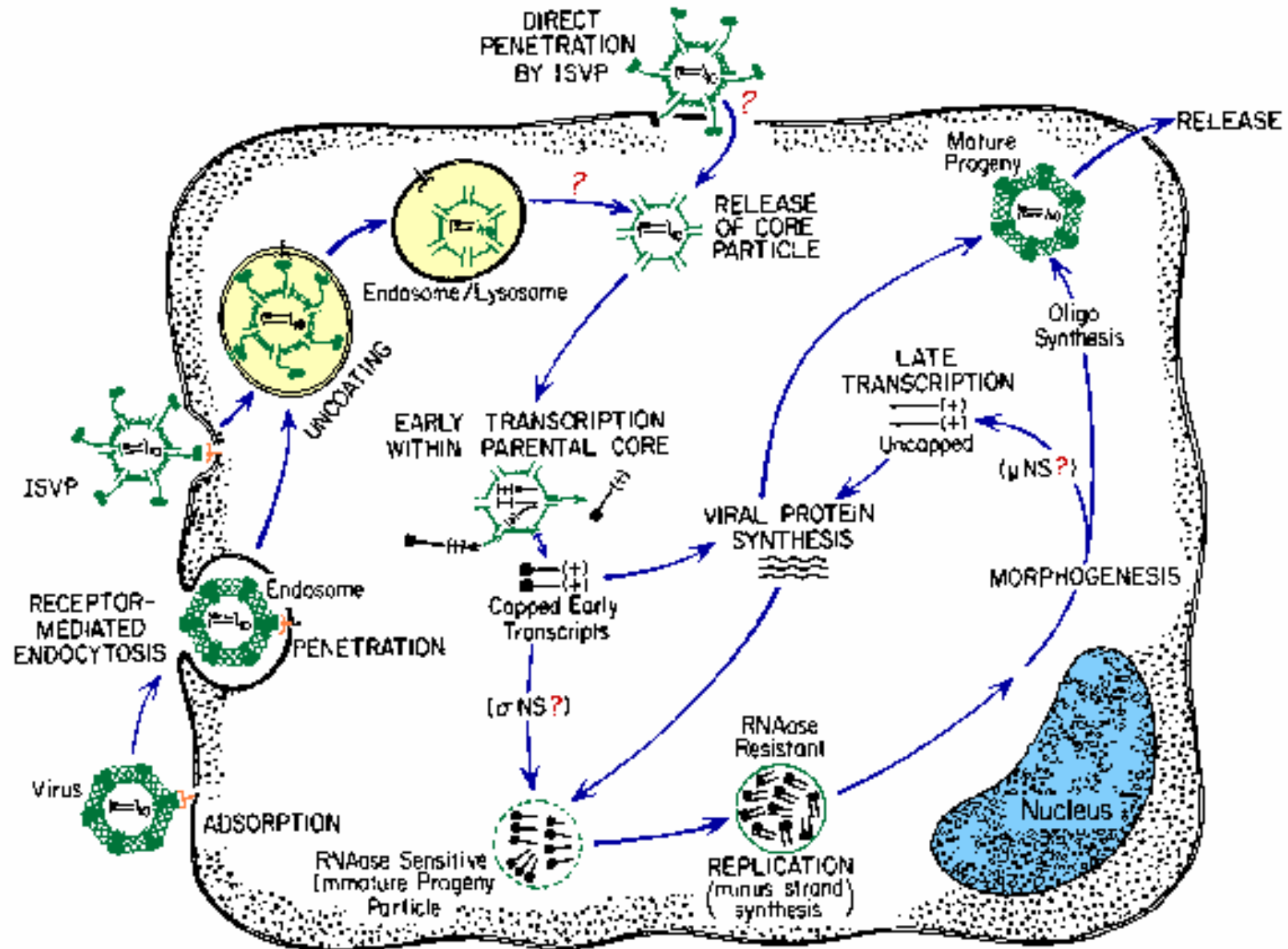


FIGURE 5.6

Schematic presentation of: (a) the "semiconservative" mode of transcription (displacement) of partitivirus and $\phi 6$ (see Secs. 5.5 and 5.6) as contrasted with (b) the "conservative" transcription of the Reoviridae. The solid lines represent parental RNA, the dashed lines, transcripts. Replication is always semiconservative.

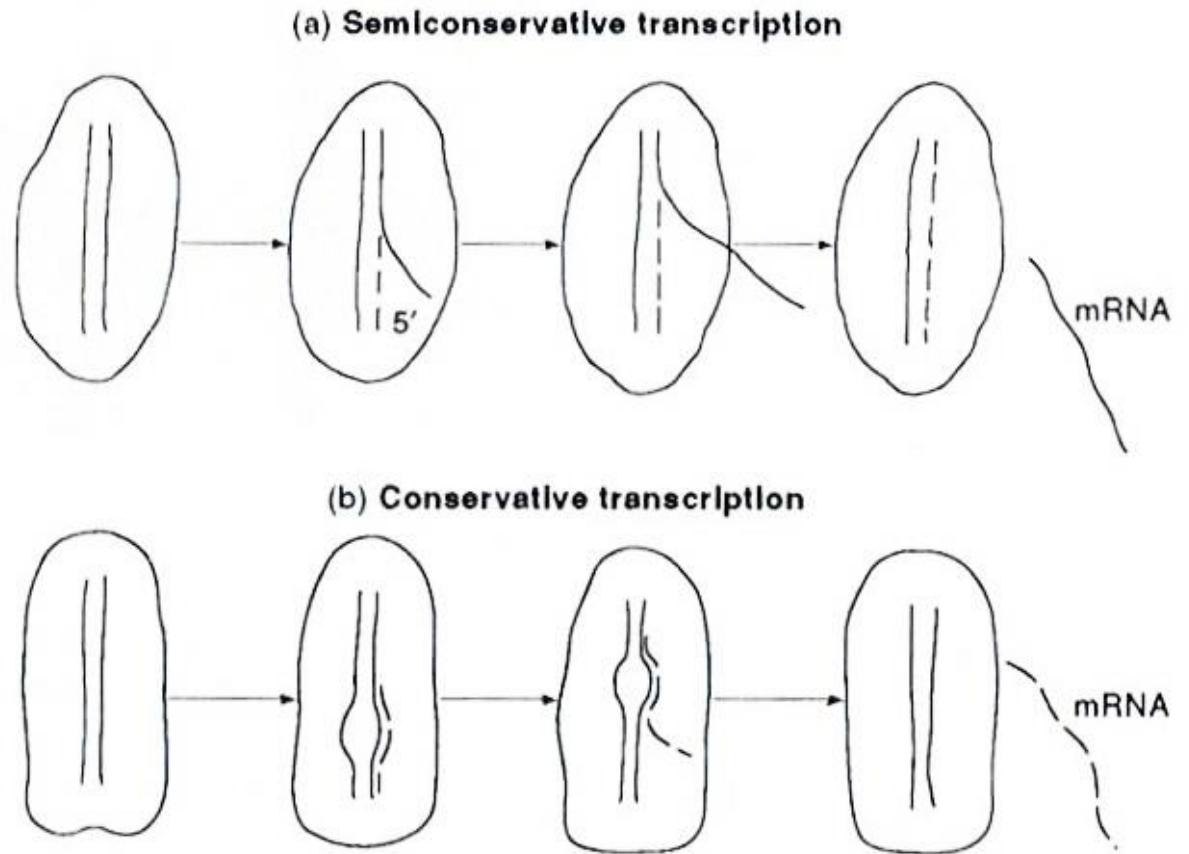


FIGURE 5.9

Genome structure of infectious pancreatic necrosis virus (IPNV), a fish birnavirus which contains two segments of double-stranded RNA in its nucleoid. Segment A mRNA is translated into a large polyprotein which is subsequently cleaved by the NS (non-structural) protein, an autocatalytic protease. Segment B mRNA encodes an RNA dependent RNA polymerase. (Courtesy of J. Leong)

