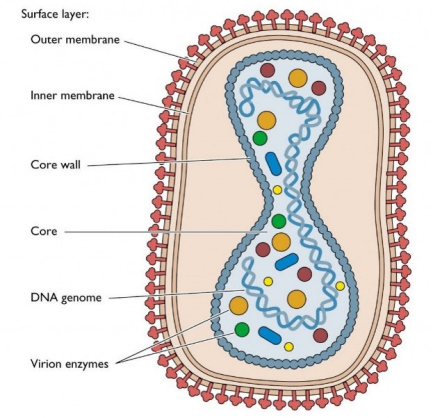
Poxvirus Structure, Genome and Replication Cheat Sheet

by Chanusai2215 via cheatography.com/140891/cs/30095/

Structure



Structure

Spherical Shaped	
Enveloped virus	One lipid membrane
Outer layer	Corrugated due to protrusions
Internal Core	Dumbbell shaped
Lateral bodies	Two present in the concavities between outer layer and Core
Outer core wall	Palisade structure with T shaped spike proteins
Inner Core wall	Smooth

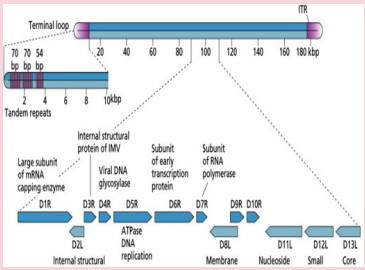
Proteins for Attachment and Entry

Attachment	A17, A25, A26, A27, D8, H3
Entry Entry Fusion Complex	A16, A21, A28, F9, G3, G9, H2, I2, J5, L1, L5, O3

proteins with enzymatic activities

Redox active proteins	E10, A2.5, and G4
Phosphorylation	Kinase- F10 & B1
Dephosphorylation	Phosphotase - H1
Proteolytic processing	proteinase - I7

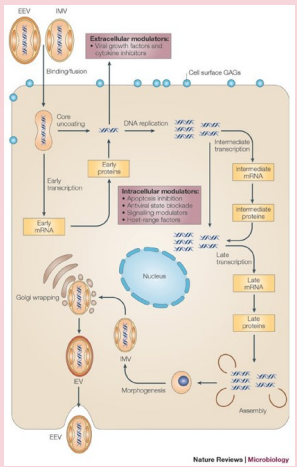
Genome



Genome Organisation

Terminal Regions	Has ITRs with secondary hairpin loop structures that connect two DNA strands and contains the variable genes that are responsible for host cell interactions
Central Regions	Conserved genes responsible for replication and morpho-genesis

Replication Cycle



Replication steps

Attachment
Entry
Early gene transcription
Replication
Intermediate gene transcription
late gene transcription
Assembly
Release

Proteins For Replication

Early Gene Proteins	Inducing proliferation of neighb-ouring cells
	Counteracting host immune defences
	Some proteins can induce a second uncoating reaction thereby releasing the viral genome from the core
	Mediating replication of the genome
Protiens In Replic-ation	Viral DNA polymerase
	Helicase-primase
	Uracil DNA glycosylase
	Single-stranded DNA-binding protein
	DNA ligase
	Holliday junction resolvase
Proteins In Transc-ription	RNA polymerase
	ETF
	Capping enzyme
	VITF-3

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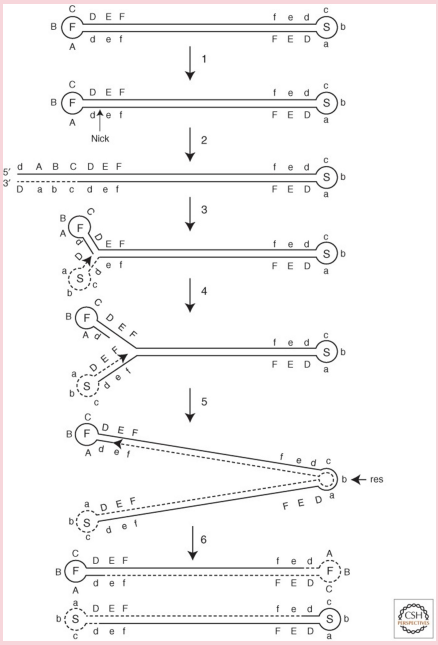
Proteins For Replication (cont)

VLTF-1, VLTF-2, VLTF-3, VLTF4
Release factor Elongation factor
Poly(A) polymerase
DNA topoisomerase

Repliation strategy



Pathogenesis

Entry through skin	Entry through respiratory tract
Replication in Malpighian layer of epidermis, fibroblasts and histocytes	Replication in alveolar macrop-hages and small bronchioles
Entry into lymphatic system	
Entry into systemic circulation	
The virus moves from the regional lymphatics to the bloodstream to cause primary viremia.	
And then multiplies in the spleen, liver, bone marrow, and other reticuloendothelial organs.	

Pathogenesis (cont)

After this, a second viremic period ensues, followed by seeding of distant sites, specially the skin, and generation of the characteristic generalized rash.
An eruption begins, with lesions forming macules, papules, vesicles, pustules, and crusts to scar formation from days 6 to 23 of the infection.