



Stock Symbol:
NNVC
(NYSE American)

**NanoViricides Revolutionary Platform Technology For
Treatment of Antiviral Infections:
One Lead Drug Alone
Addresses a \$2.5 to \$4.3 Billion Market**

Presented on: 2024-09-18

Presented by:

Anil R. Diwan, PhD

President & Exec. Chairman

Mobile: +1 (203) 606-9180

email: adiwan@nanoviricides.com

Disclosure Statement

NanoViricides, Inc. is a NYSE-American listed publicly traded company (stock symbol: NNVC).

This is not an offering memorandum and should not be construed as such. It is provided as a non-confidential document for informational purposes only.

NanoViricides, Inc.(www.nanoviricides.com) is a clinical stage company that is creating special purpose nanomaterials as therapeutics against a number of different viruses. The Company's novel nanoviricide® class of drug candidates are designed to specifically attack enveloped and non-enveloped virus particles and to dismantle them. All of our drug candidates are based on broad and exclusive worldwide licenses in perpetuity from TheraCour Pharma, Inc. for the development of drugs to combat viral infections of Human Coronaviruses, Human Immunodeficiency Virus (HIV/AIDS), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Herpes Simplex Viruses (HSV-1 and HSV-2), Varicella-Zoster Virus (VZV), Influenza and Asian Bird Flu viruses, Dengue viruses, Ebola/Marburg viruses, Japanese Encephalitis virus, viruses causing viral Conjunctivitis (a disease of the eye). The Company's technology is based on broad, exclusive, sub-licensable, perpetual field licenses to all drugs developed in the licensed field areas (virus indications) from TheraCour Pharma, Inc. The Company obtains additional licenses after determining that it intends to pursue a drug candidate in the licensed field into commercialization. The Company's business model is based on licensing technology from TheraCour Pharma Inc. for specific application verticals of specific viruses, covering all drugs for the licensed field of application, as established at its foundation in 2005.

This document contains forward-looking statements that reflect the current expectation of NanoViricides, Inc. (the "Company") regarding future events. Actual events could differ materially and substantially from those projected herein and depend on a number of factors. Certain statements are "forward-looking statements" within the meaning of Section 27A of the Securities18 Act of 1933 and Section 21E of the Securities Exchange Act of 1934. You should not place undue reliance on forward-looking statements since they involve known and unknown risks, uncertainties and other factors which are, in some cases, beyond the Company's control and which could, and likely will, materially affect actual results, levels of activity, performance or achievements.

The Company assumes no obligation to publicly update or revise these forward-looking statements for any reason, or to update the reasons actual results could differ materially from those anticipated in these forward-looking statements, even if new information becomes available in the future. Important factors that could cause actual results to differ materially from the company's expectations include, but are not limited to, those factors that are disclosed under the heading "Risk Factors" and elsewhere in documents filed by the company from time to time with the United States Securities and Exchange Commission and other regulatory authorities.

Although it is not possible to predict or identify all such factors, they may include the following: demonstration and proof of principle in pre-clinical trials that a nanoviricide is safe and effective; successful development of our product candidates; our ability to seek and obtain regulatory approvals, including with respect to the indications we are seeking; the successful commercialization of our product candidates; and market acceptance of our products.

Presentation Outline

- NV-387, A Revolutionary Broad-Spectrum Antiviral Drug Candidate
- NV-387 Clinical Indications in Development and Markets: RSV, Influenza, COVID, MPOX/Smallpox, Severe Acute Respiratory Infections (SARI-Viral)
- Virus-Family-Specific Drugs in Pipeline
 - NV-HHV-1 -> HerpesVirus Family
 - NV-HIV-1 -> HIV/AIDS
- Cures for Non-Latency Viruses -> Example: NV-387-g-485
- Summary
- Executive Team
- Appendix - Details

NanoViricides, Inc. Attacking Very Large Market Sizes - Lead Drug 1 NV-387 is A Revolutionary Broad-Spectrum Antiviral

- Proven in Animal Efficacy Studies Against RSV, Influenza, COVID, Smallpox/MPox
 - RSV: NV-387 Cured RSV Lethal Lung Infection in Mice
 - Influenza: NV-387 Substantially Superior to Tamiflu, Xofluza in Lethal Influenza A in Animal Trial
 - COVID: NV-387 Substantially Superior to Remdesivir in COVID Animal Model
 - MPOX/Smallpox: NV-387 Equivalent to TPOXX in MPox/Smallpox Animal Models
- Effectiveness Against Many Other Viruses is Expected, Based on the Mechanism and the Drug Design
 - Hendra, Nipah Viruses, Possibly Dengue, Zika viruses, Chikengunya ...
- Over 90% of Human Pathogenic Viruses Use the Host-Side Feature (Sulfated Proteoglycan) that NV-387 Mimics
- NV-387 is Poised to Revolutionize Treatment of Viral Infections Just As How Penicillin Revolutionized Treatment of Bacterial Infections

NanoViricides, Inc. Attacking Very Large Market Sizes - Lead Drug 1

NV-387 is Available With Many Routes of Administration

- NV-387 is Orally Available
 - Oral Syrup -> Enables Titration by Body Weight for Pediatric Cases
 - Oral Gummies (“soft solid”, dissolving slowly in mouth) -> No Swallowing Issues
- NV-387 Solution for Injection, Infusion, and Inhalation
 - For Severe, Hospitalized Cases
 - Direct Lung Inhalation Using Aerosolization Technique Enables Rapid Drug Delivery to the Most Affected Organ - Lungs - in Respiratory Viral Infections
- NV-387 Solution for Nasal Spray
 - For Prophylaxis
- NV-387 Can Also be Developed into a Skin Cream or Ointment for Topical Delivery

NanoViricides, Inc. Attacking Very Large Market Sizes - Lead Drug 1 NV-387 is Phase II Ready; Clinical Trials for Multiple Indications

- NV-387 Has Completed Phase I Human Clinical Trial
 - No Reported Adverse Events
 - Safety and Tolerability in Humans Established
- NV-387 is Eligible for Phase II for Treatment of MPOX in Central Africa
 - MEURI Protocol of WHO (Monitored Emergency Use of Unregistered and Investigational Interventions)
- NV-387 for Treatment of Pediatric RSV Infection
 - Path: Phase IIa Adults, then Phase IIb/III in Infants and Young Children
- NV-387 for Treatment of Severe Acute Respiratory Infections, Viral (“SARI-Viral”)
 - Phase II: “One Drug - Many Bugs” Novel Adaptive Clinical Trial Design
 - Includes RSV, Influenza, Coronaviruses (SARS-CoV-2/COVID), as well as less known viruses such as hMPV, Others

NV-387 for Treatment of Influenza Infection - Large Market

- Influenza Viruses Develop Drug Resistance
- Resistance Not Likely Against NV-387, because of its Host-Mimetic, Direct-Acting Antiviral Mechanism
- ~\$4.6Bn in 2024 growing to ~\$5.9 Bn in 2027, 8.35+% CAGR, estimated for USA Market
- Exceeding \$10 Bn if and when An Anticipated Bird Flu Pandemic Hits
- Current MCMs are
 - Tamiflu, Xofluza (another, Relenza, has difficulty with administration)
 - Drug Resistance Develops Very Rapidly for Xofluza and Readily for Tamiflu
- NV-387 Oral was Substantially Superior to Current MCMs in Animal Trials

NV-387 for Treatment of RSV Infection - Another Large Market

- RSV - An Important Disease Especially for Newborns and Young Children
- Also for Adults over 65 and Patients with Immune Compromise Status
- USA Market Size Estimated at ~\$2.6Bn in 2024 growing to ~\$4.3 Bn in 2027, 18+% CAGR
- Current MCMs are 2 Vaccines for Adults and 2 Prophylactic Antibodies for Protection of Infants at Risk
- No Treatment for RSV-Infected Children or Adults, Except Ribavirin (Toxic) which is a Last Resort
- Market Size Could be Substantially Larger if a Treatment is Developed
- Non-Dilutive Funding is Possible for Clinical Trials

RSV Treatment Market Value - A Case Study

- Pfizer Acquired ReViral for ~\$525 Million in 2022
- Pfizer Estimated Revenues Exceeding \$1.5 Bn Per Year for this RSV Drug
- Company had only one Phase II drug, that was indicated only for RSV Infection (fusion inhibitor), Sisunatovir
- Pfizer Purchased Company Immediately After Phase IIa RSV Infection in Hospitalized Infants for Safety, Tolerability, PK and Clinical Effect
- Sisunatovir has apparently not completed further clinical trials
- Unmet medical Need for RSV Treatment Remains

NV-387 for Treatment of COVID, Long COVID - Large Market

- COVID Waves 2-3 Times Annually; plus other seasonal coronaviruses
- USA Market Size is Still in Billions, Post-Pandemic
- “Long COVID” Cases - A Majority Have Residual Virus
- Current MCMs are Not Very Effective
 - Remdesivir Requires Infusions; Toxic, and No Clear Clinical Benefit per WHO
 - Paxlovid Oral Had No Benefit for COVID in Young Adults in Clinical Trial
- NV-387 is Substantially More Effective in Animal Trials than Remdesivir
- NV-387 Clinical Trials as Indication for SARI-Viral May Enable Regulatory Approval for COVID
- Also Seek Non-Dilutive Funding and Institutional Support for this Indication
 - Clinical trials for COVID and Long COVID Clinical Trials Have Become Difficult to Administer, and Ideally Should be Performed by Medical Institutions

NV-387 Other Markets: Biodefense Smallpox/Mpox

- US BARDA Has a Requirement for an Alternative Drug for Smallpox
 - Also, TPOXX® (tecovirimat) Failed in Clinical Trial for Treatment of MPOX Infection; Raises Doubts About Its Clinical Value Against Smallpox as well
- NV-387 is Eligible for Phase II for Treatment of MPOX in the Current Epidemic in Central Africa
 - Could Lead to Approval If Successful for MPOX as well as Smallpox
- Standard Clinical Regulatory Pathway for Smallpox is “Animal Rule”
 - Phase II and Phase III Animal Trials to be Conducted under BARDA
- US Strategic National Stockpile (US SNS) Would Purchase Stock worth Billions of Dollars
 - Currently Annual Replacement Contracts worth over \$500M to SIGA for TPOXX

NanoViricides, Inc. Attacking Very Large Market Sizes - Lead Drug 2 NV-HHV-1 Phase I Ready

- NV-HHV-1 => A Drug Designed to Treat All HerpesViruses
- NV-HHV-1 as Skin Cream for Treatment of Shingles, HSV-1 “Cold Sores”, and HSV-2 “Genital Ulcers” is Phase I Ready
 - Has Completed Required Non-clinical Safety/Tolerability Studies
- Market Size for HSV-1, HSV-2, Shingles are Each in Multi-Billion Dollars

NanoViricides, Inc. Attacking Very Large Market Sizes - Lead Drug 3 NV-HIV-1 Towards Phase I

- NV-HIV-1 => A Drug Designed to Treat All HIV Viruses
- Injectable Drug Has Excellent Animal Trial Results
- Oral Drug Also in Development
- Next Step is to Advance it Into Regulatory IND-Enabling Studies
- -----
- Many Other Drugs in the Pipeline:
 - NV-387-g-485 Encapsulates a Nucleotide Analog NV-485 within NV-387; For Dual Mode Attack on the Complete Virus Lifecycle (Re-Infection and Replication), Enabling Cures of Susceptible Viruses
 - NV-HHV-2 for Systemic Treatment of Herpesvirus Infections

NanoViricides Current Drug Assets Summary

	Asset Name	Type	Indication(s) (Animal Model Efficacy)	Stage	Remarks
1	NV-387	Nanoviricide Drug Candidate	Broad-Spectrum Antiviral: COVID, RSV, Influenza, Poxviruses	Phase I Completed Oral Syrup and Oral Gummies	No AEs, No Drop-outs in Ph I Healthy Subjects. Efficacy Superior to Existing Drugs in Animal Models.
2	NV-HHV-1	Nanoviricide Drug Candidate	HerpesViruses-Specific Antiviral: HSV-1, HSV-2, VZV	Non-Clinical Completed Skin Cream	Ready to Proceed to Phase I. Efficacy Demonstrated in VZV - Human Skin Model.
3	NV-485	Small Molecule, Nucleotide Analog, CTA	Broad-Spectrum, RNA Viruses	Animal Model Efficacy & Preliminary Safety in RSV Tested	Can be developed by itself, but our intention is to use it in the Next-Generation drug candidate NV-387-g-485.
4	NV-387-g-485	Nanoviricide, Multi-Mechanism Drug Candidate	Broad-Spectrum, primarily RNA Viruses	Animal Model Efficacy in RSV Tested	Encapsulating NV-485 into NV-387 creates NV-387-g-485 with Greater Benefits than Either Alone.
5	NV-HIV-1	Nanoviricide Drug Candidate	HIV-1, HIV-2 AIDS	Animal Model Efficacy Tested	Ready for Non-Clinical regulatory IND-Enabling Studies.
6	NV-HHV-2	Nanoviricide, Multi-Mechanism Drug Candidate	Systemic Treatment. HerpesViruses-Specific Antiviral: HSV-1, HSV-2, VZV	R&D	Systemic, Multi-Mechanism Treatment of Herpesvirus Infections, Potentially Curing the Infections.

NanoViricides is Revolutionizing Treatment of Viral Diseases, Just as Antibiotics Revolutionized Treatment of Bacterial Diseases!

- Ultra-Broad-Spectrum Antiviral NV-387 Completed Phase I Clinical Trial
 - Collaboration in India
 - NV-387 is Highly Active Against Coronaviruses, RSV, Influenza, Smallpox/MPox...
 - Superior to Existing Drugs (where tested in Animal Models)
 - Potential for Activity Against >95% of Human Pathogenic Viruses
 - Host-Mimetic - Sulfated Proteoglycan-Mimetic - Ligand Design & Chemistry
 - Virus Escape-Resistant, Unlike Vaccines, Antibodies, other Small Molecule Drugs
- Pan-HerpesVirus Drug NV-HHV-1: Active Against Shingles/Chickenpox Virus (VZV), Cold Sores (HSV-1), Genital Ulcers (HSV-2); Close to IND
 - NV-HHV-1 Skin Cream for Topical Treatment of Shingles/Chickenpox Rash - 1st Indication
- HIV/AIDS Highly Active Lead NV-HIV-1 - Orthogonal to Existing Drugs
 - Efficacy in SCID-Hu Thy/Liv Animal Model
 - HIV Would Not Escape Drug! Ligand is CD4-Mimetic for Conserved Gp-120 Binding

NanoViricides Technology is Not Limited to Antivirals or Anti-Infectives: Applications Across Many Therapeutics Areas

- Biomimetic, Biocompatible, and Biodegradable Drug Delivery Platform
- Site-Directed Drug Delivery is Feasible
- Oncology - Replace Antibody-Based Receptor Recognition
- Multi-modal Drugs with reduced Complexity
- Oncology and Other Programs - Rescue “Non-Lipinski” Drug Candidates

Strong Executive Team

Anil R. Diwan, PhD President & Exec. Chairman

Co-Founder

Led Uplisting to NYSE-American Exchange in 2013

Raised Over \$100M

Co-Inventor of Nanoviricides™ & of TheraCour®

25+ years Leadership & Entrepreneurial experience

Key Patents, Several NIH SBIR Awards

PhD (Biochem Eng - Rice), BTech (ChemEng - IITB)

Ranked 9th All India on JEE to IITs (1975)

Krishna Menon, VMD, MRCS, PhD Consulting Pre-Clinical Studies

30+ Years of Pharmaceutical Industry Experience in Drug
Discovery and Pre-clinical Regulatory Development

Eli Lilly President's Award

AZT, GemCitabine, Pemetrexed (Alimta) Development

Eli-Lilly, Dana-Farber, Beth-Israel, Bayer Alumnus

Meeta R. Vyas, MBA CFO

30+ years Experience in Corporate Performance Improvement,
Finance, M&A, EBITDA Growth...

Previously: Principal, The Gores Group; Director, Kamyron
Capital; CEO, Signature Brands, Inc. (a public company, known
for "Mr. Coffee"); Ran \$1B GE Appliances Division; Consultant,
McKinsey & Company

MBA (Finance) Columbia U, BS (ChemEng) MIT

Jayant Tatake, PhD VP, R&D

30+ Years of Pharmaceutical Industry Experience in Drug
Discovery, Manufacturing, QA/QC, CRO, Synthesis, Scale-up,
Formulations, and Pharmaceutical cGMP Expertise

Former Asst. Director, Pharma. Analytics,
InterPharm, Inc.

Co-Inventor of Nanoviricides® & TheraCour®
PhD, UICT, Mumbai, India

Board of Directors

Anil R. Diwan, PhD President & Exec. Chairman

Co-Founder, Led Uplisting to NYSE-Amer. in 2013, Raised \$100M+, Co-Inventor of Nanoviricides™ & of TheraCour®
30+ years Leadership & Entrepreneurial experience

(Not an Independent Board Member)
Director and Chairman Since Founding in 2005

Mak Jawadekar, PhD ✓

35+ Years of Pharmaceutical Industry Experience, Pharma Strategic Consultant. Previously at Pfizer, Inc., as Director, Portfolio Management & Analytics, and as Vice President, Asia Colleague Resource Group, in Pfizer Global R&D. Business and Research experience in joint ventures, alliance management, contracting, pharma R&D, drug delivery, clinical supply manufacture, etc. Global experience working with United States, Europe, India, Japan, China.

Independent Board Member since February, 2020

Hon'ble Theodore "Todd" Rokita, JD ✓

Presently Attorney General, State of Indiana. Former US Rep. from Indiana (4 terms since 2010). Served on several House Committees. Co-owner, Apex Benefits Group, Inc. Extensive executive, team-building, business strategy, and fiscal management expertise in the private sector, alongside his public service leadership experience. Serves or has served as a Member of the Board of Directors of several commercial and charitable institutions.

Independent Board Member since May, 2020

Brian M. Zucker, CPA ✓

30+ years of experience as a CPA specializing in the securities industry. A Partner at CFO Financial Partners, LLC (<https://www.cfopartners.com/>). Also serves as the CFO and Financial Operations Principal for numerous broker dealers and hedge funds. Partner at RRBB Accountants & Advisors. CFO of EIG Energy Partners Capital Markets, LLC. Ex-Senior Consultant at Deloitte Haskins & Sells and at Price Waterhouse. Mr. Zucker holds several FINRA licenses.

Independent Board Member since November, 2020

✓ = Independent Board Member

**NanoViricides is Revolutionizing
Treatment of Viral Diseases,
Just as Antibiotics Revolutionized
Treatment of Bacterial Diseases!**



“Nanotechnology-Enabled Targeted Viricides”

A Publicly Traded Company, “NNVC”

www.nanoviricides.com

Thank you for your attention.

**Please address additional inquiries/
correspondence to:**

**Anil R. Diwan, Ph.D.
President & Executive Chairman
NanoViricides, Inc.**

Office:

**1 Controls Drive
Shelton, CT 06484.**

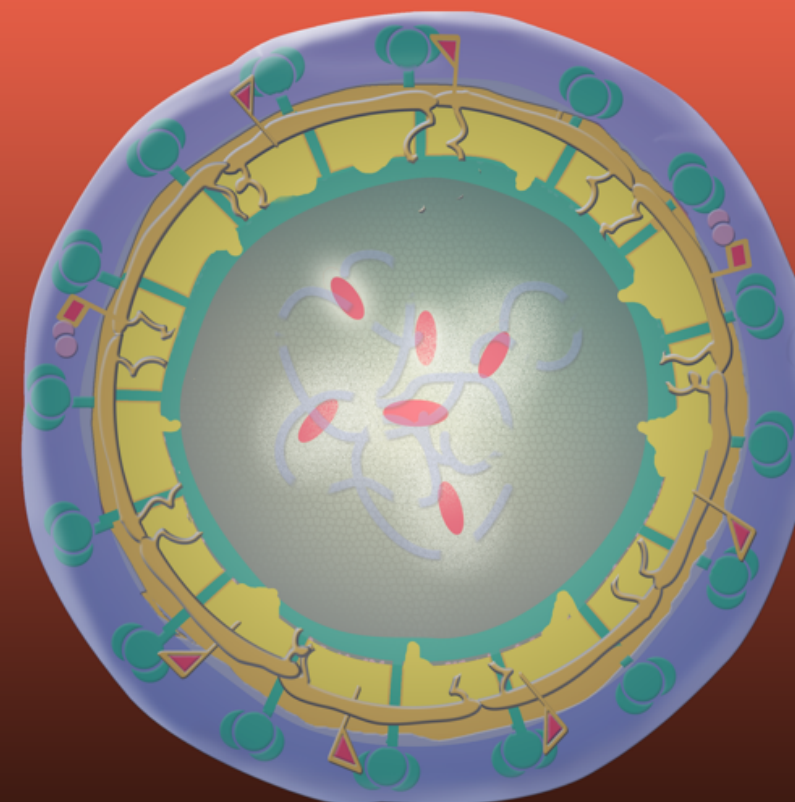
Mobile Phone:

+1 (203) 606-9180

Email:

adiwan@nanoviricides.com

To Destroy Viruses

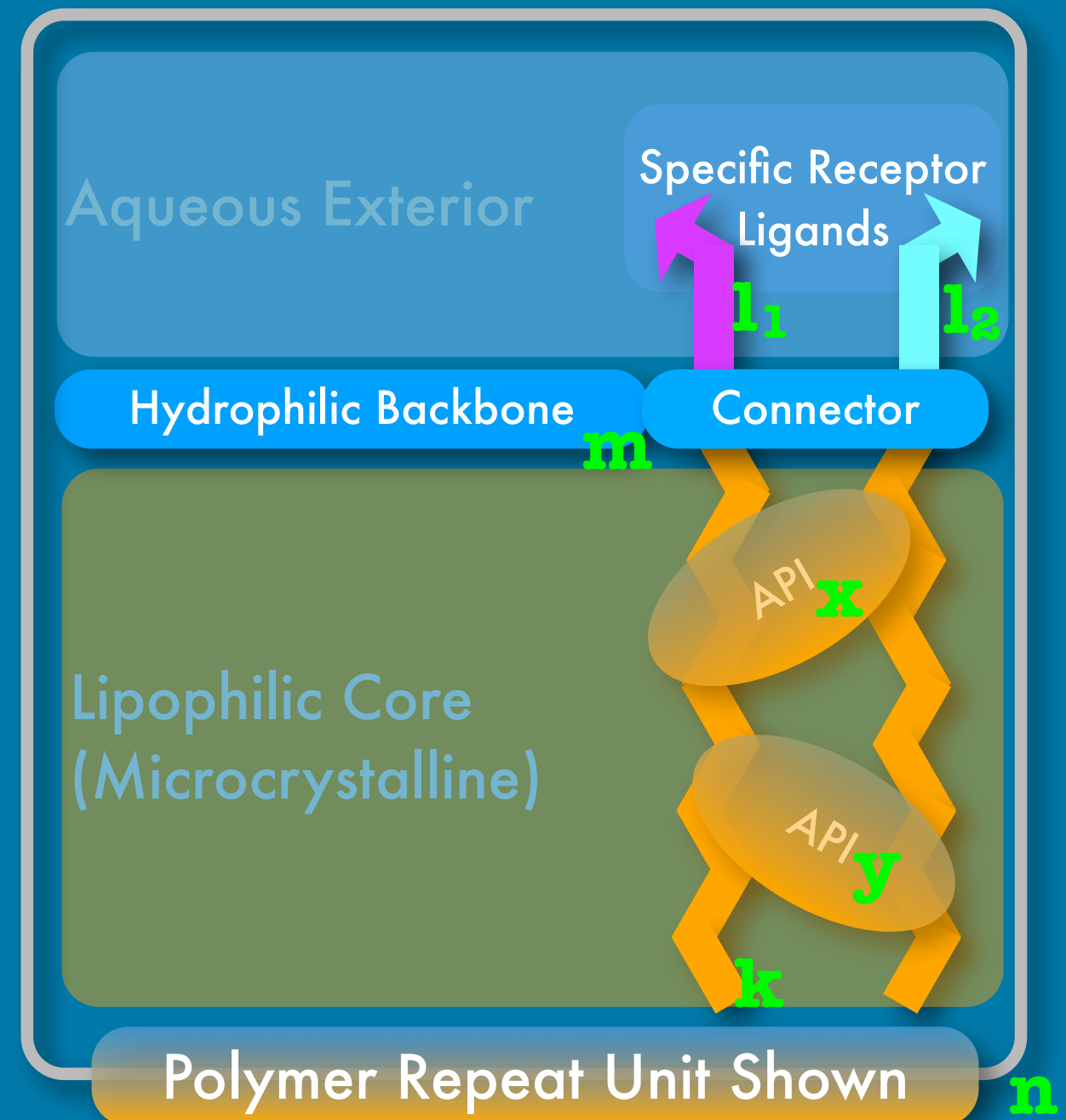


APPENDIX

Schematic Structure of a Nanoviricide™: Customizable, Tailorable Platform Technology

1. An Antiviral Ligand is designed based on how the virus binds to a cell.
2. This ligand is chemically attached to a Nanoviricide Base Polymeric Micelle to Create a Nanoviricide.
3. Optionally, Other APIs with Complementary MoA can be Encapsulated.

- Nanoviricide Base Polymeric Micelle
- PEG based polymer - minimize immune reactions & clearance
- Lipid pendants - **shape-shifting ability**, and **encapsulation** of APIs
- “Biomimetic” - take advantage of addressing, lipid fusion, encapsulation
- Multiplicity of Ligands evenly spaced
“Address” the envelope to a specific site - virus, specific cell/tissue
- Nano-scale “Velcro” Effect
- Different Ligands for “Multi-Specific” or “Multi-Targeting” Interaction
- Sustained Drug/Delivery - Tailorable
- Administration Route Defined at Design Time - minimize formulation development
- Oral (Syrup, “Gummies”), Sub-lingual, Skin Cream, Ophthalmic, Injectable, Infusion, Lung Inhalation



NanoViricides Technology Platforms Summary

	Technology Platform Asset	Purpose	Stage	Remarks
1	NanoViricides Encapsulation Technology	For Encapsulation of Difficult Drugs, Enabling Oral and Other Delivery Routes	Tested in Animal Models for Remdesivir itself, a Remdesivir-prodrug, a Ribavirin-prodrug, and a new nucleotide analog NV-485	Protect Guest Drug & Improve PK/PD. Enable Oral Delivery. Enable Sustained Effect & Infrequent Dosing.
2	NanoViricides Specific Targeting Technology	Covalently Attached Small Molecules Provide Multi-prong Targeting	Tested in Animal Models. Ex.: NV-HHV-1, NV-HIV-1, Others.	Specific Targeting of Viruses, Cancer Cells, Other Cell Types. Receptor-Mediated Delivery
3	NanoViricides Specific Targeting & Encapsulation Technology	For Tissue- or Onco-Specific Targeting of Encapsulated Drugs	Tested in an Animal Model for HSV-2 infection (NV-HHV-1 encapsulating an Acyclovir-prodrug). Tested in an Animal Model for Metastatic Pancreatic Cancer.	Receptor-Mediated Drug Delivery. Develop Tissue/Cell/Virus-Targeted, Multi-Modal Drugs.

Responding to Novel Viral Pandemics - The Pain Points

MCM Technology  Attribute 	Vaccines	Antibodies	Small Chemicals	Nanoviricides
Escape Variants Arise?	Yes. Necessitating New Development	Yes. Requiring New Development	Yes. Not Amenable to Rapid New development	Highly Unlikely (Drug Remains Active)
Activity Spectrum	Very Narrow; Few Strains	Very Narrow	Somewhat Broad; Limited by Resistant Variants	Extremely Broad, Encompassing Multiple Virus Families
Routes of Administration	Injections, Some Oral, Some Nasal Possible	Infusions	Some Oral, Some Infusions, Some Aerosols	Same Drug Available via Many Routes Including Oral and Inhalation
Side Reactions	Important (Because of Large Numbers to be Vaccinated)	Important	Limited	No Reportables in Phase I
Limitations on Subject Pools?	Yes. Limitations Exist.	Yes. Limitations Exist.	Yes. Limitations from DDI, Inherent Toxicities, etc.	Very Few If Any: Strong Safety and Multiple RoA's

NanoViricides Technology Differentiation

	Nanoviricide Drug	Antibodies	Other Drugs	Vaccines
Mechanism	Re-Infection Inhibition	Neutralization	Replication Inhibition	Antibodies Generation
Therapeutic Post-Infection?	Yes	Yes	Yes	No
Viral Resistance	Unlikely	Rapidly	Eventually	Rapidly
Cure Possible for Non-Latency Viruses?	Yes	No	No/Maybe (Combo.)	No
Broad Spectrum?	Yes	No	No/Maybe	No
Immune-Compromised Patients?	Yes	No/Maybe	Yes	No
Oral Dosing?	Yes	No	Yes/Maybe	No/Maybe
No Need for Infusion	Yes	No	Yes	Yes
Infrequent Dosing?	Yes	No	No	Yes
Easy Compliance	Yes	No	No	No (Social Factors)
No or Minimal Side Effects	Yes	No	No	No (Large Populations)
Safety (Allergy, Mutagen, Immunogen, Genotox)	Yes	No (Immune Reactions)	No (Mutagenic, Other)	No (Immune Reactions, Allergy)
Storage and Supply Chain Conditions	RT, 2-8°C	2-8°C	RT/2-8°C	-20°C
Site Targeting	Yes	Yes	Yes/Maybe	No/Maybe
Encapsulation	Yes	No	No	No

Complex Virus LifeCycle Enables Many Strategies for Attack

After Primary Infection from External Sources;
for the Infection to Take Hold in the Host:

- All Viruses Must Infect Cells
 - BIND to ATTACHMENT RECEPTOR(s)
 - TRANSFER to COGNATE RECEPTOR(s)
 - FUSE OR (PINO/ENDO)-CYTOSE INTO CELL
- All Viruses Must Replicate Within Cells
 - UNCOAT in CELLULAR COMPARTMENT
 - ASSEMBLE VIRAL and HOST MACHINERY
 - CLONE GENOME
 - REASSEMBLE VIRAL PARTICLE
- and Successfully Exit Cells
 - Without Killing Cell or by Destroying Cell
- To Succeed, The Virus Must Dysregulate Host Immune System

BUT

Viruses Have Evolved Diverse Strategies for Each of the LifeCycle Events Making it Very Difficult to Design & Develop a Drug that Works Against a Large Number of Viruses

e.g. Nucleo(s)(t)ide Inhibitors, although Broad Spectrum, In Practice, They Have Dose-Limiting Toxicities that Limit Effectiveness and Usability

NanoViricides Platform Technology is a New Approach that Overcomes These Problems

The “Achilles Heel(s)” of the Virus

THE ENTRY MECHANISMS OF VIRUSES CAN YIELD
SAFE AND EFFECTIVE, BROAD-SPECTRUM AS WELL AS SPECIFIC,
DRUG STRATEGIES RESULTING IN
DRUGS THAT THE VIRUS CANNOT ESCAPE

- Even As a Virus Mutates, including in its Receptor Interaction Regions; the Site on the Receptor to which it binds DOES NOT CHANGE Much
- NanoViricides Technology Enables Drugs that the Virus Cannot Escape, Because We Copy That Invariant Attachment or Receptor Site !

Just mimicking the Attachment/ReceptorSite is Not Enough!
We Design the Mimetic into a Nanomachine
to Destroy the Virus Particle!

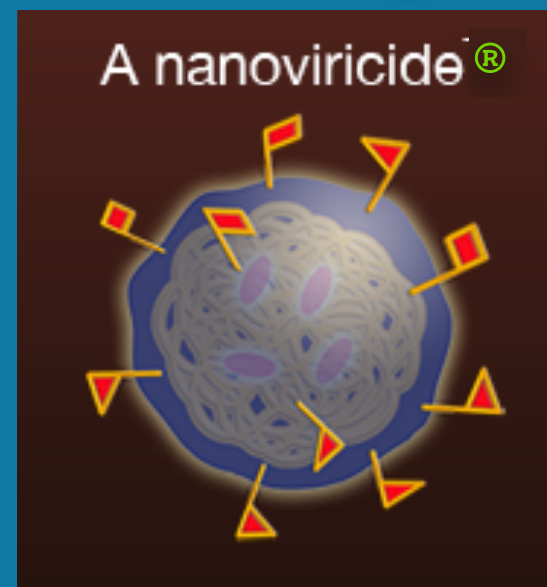
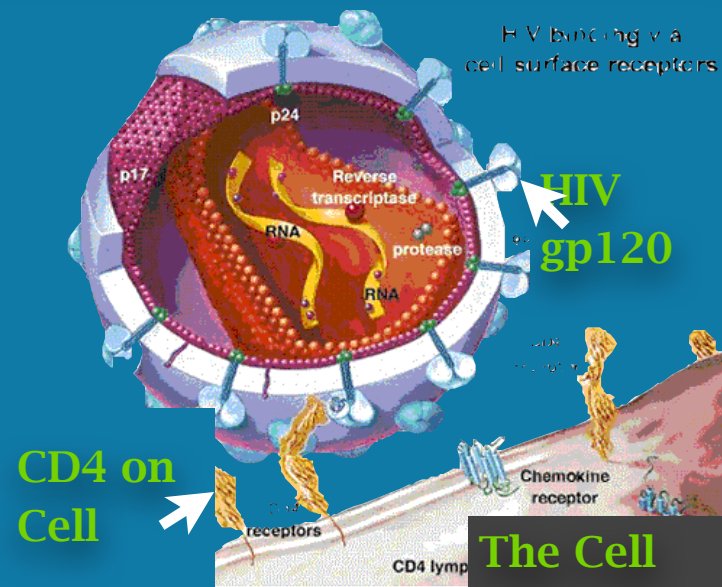
The “Achilles Heel(s)” of the Virus: Attachment Receptor(s) and Cognate Receptor(s)

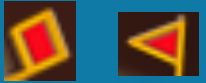
- Cognate Receptors are Virus-Type/Subtype Specific (e.g. SARS-CoV-2 uses ACE2, HIV uses CD4; HSVs use HVEM).
- Activity Spectrum of Drugs Mimicking Cognate Receptor Sites would be that of the Virus Type including all mutants.
- NV-HHV-1, NV-HIV-2 Mimic Cognate Receptor Sites (HVEM and CD4 Respectively).
- Certain Classes of Attachment Receptors are Broadly Employed by Many Diverse Virus Families! Examples: Sulfated ProteoGlycans, Sialylated Receptor(s), Hyper-Mannose-Binding Lectin-Type Cellular Receptors.
- Nanoviricides Mimicking Attachment Receptor Sites Would Provide an Extremely Broad Activity Spectrum.
- NV-387 is Designed to Mimic the Virus-Binding Structures of Sulfated Proteoglycans (“S-PG”).
- Over 90% of Human Pathogenic Viruses Use Heparan Sulfate PG; Many Other Viruses Use Chondroitin Sulfate, Dermatan Sulfate, and Others!

NanoViricides Technology Platform Defines A Novel Paradigm : Cell-Mimicking Nanomachines that Seek to Bind, Encapsulate and Destroy a Virus Particle Without Immune System Assistance

A Virus Uses Specific Cellular Receptor(s).

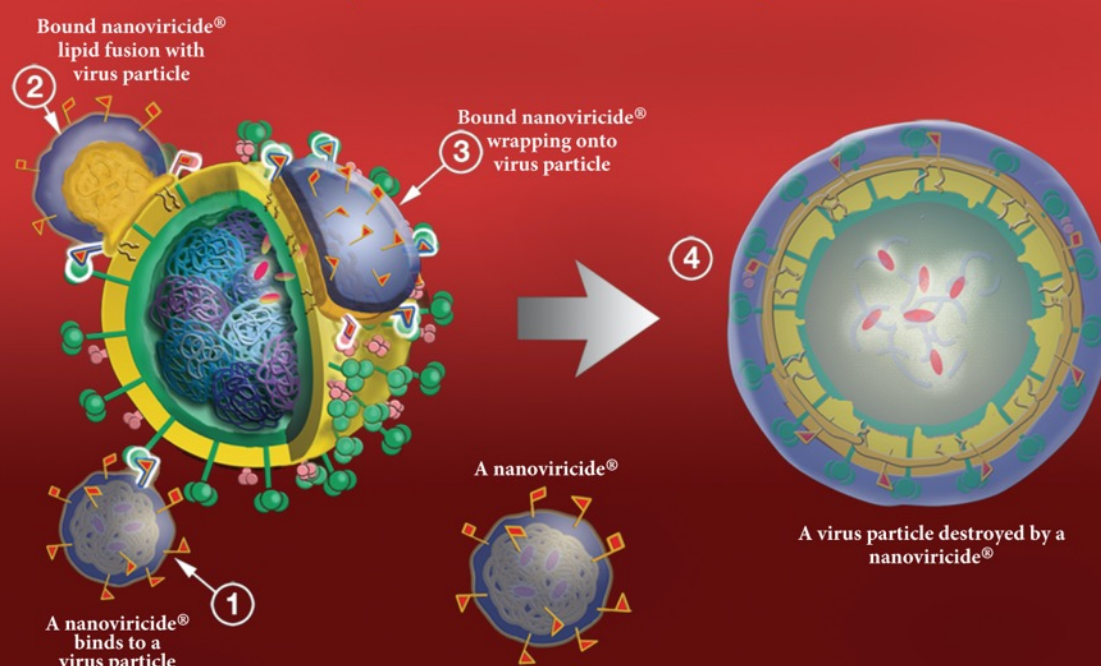
Viral Coat Protein Mutates Readily;
But Binds to the Same Site(s) on Its Cellular Receptor(s).



Small Chemical Ligands : 
that Mimick the “Key” Invariant
Virus Binding Site on Cellular
Receptor(s) Drive Binding to Virus.

Polymeric Micelle with Pendant
Lipid Core and Amphiphilic
PEG-based Shell Drives
Lipid-Lipid Fusion with Virus
Envelope and Destabilization of
the Particle.

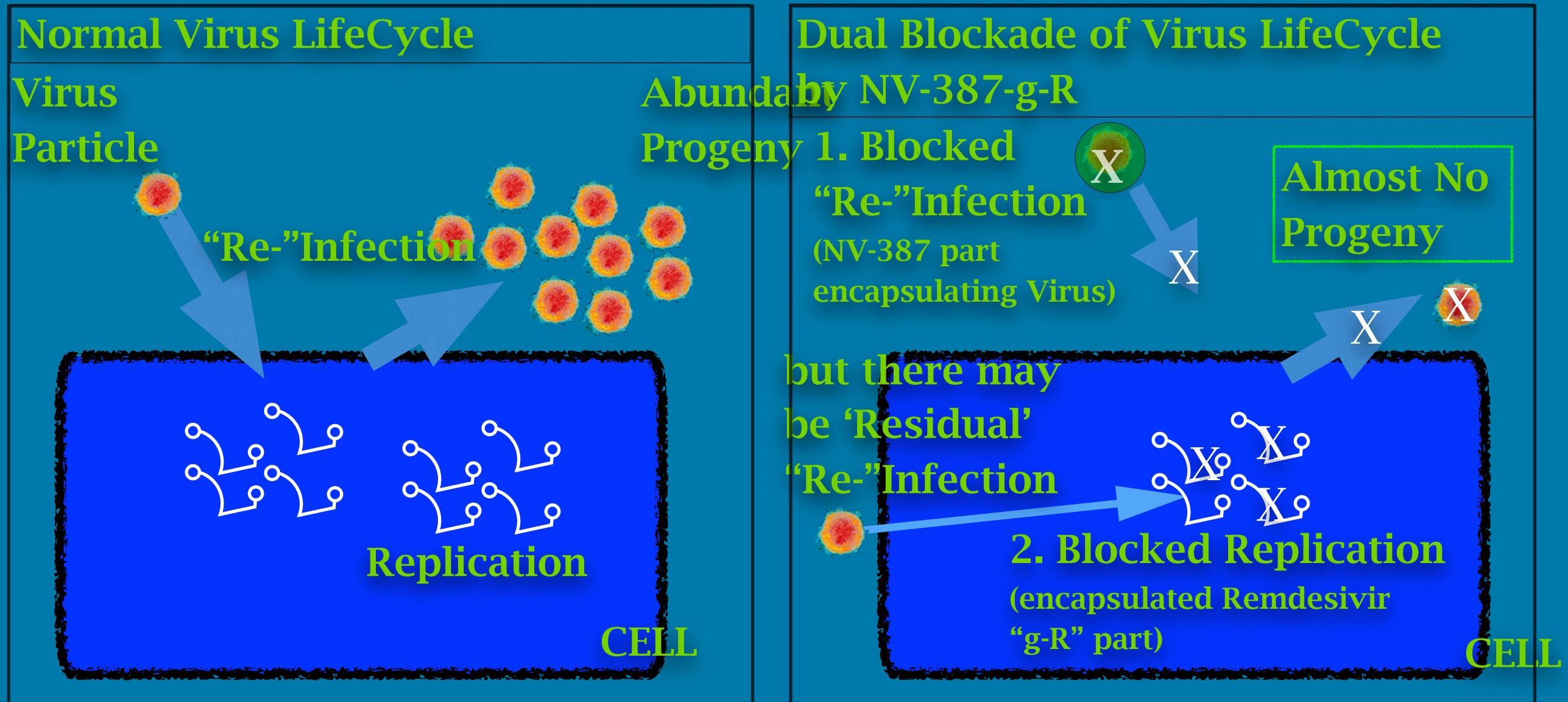
Attacking the Virus Using Its Own, Conserved, Cell-Binding Features:
Multi-point, Multi-targeted Therapeutics



- Bind the Virus Particle at Multiple Points, “NanoVelcro” Effect (Stages #1,2,3)
- Engulfment of the Virus Particle by “Shape-shifting” Nanoviricide Micelle would Render the Virus Particle Incapable of Infecting Cell (stage #4)

Enabling Potential Cures of Non-Latency Viruses: UNIQUE DUAL MODE ATTACK Enabled by Encapsulation Capability

Example: NV-387-g-485 is Designed to Completely Block Many Viruses
(Encapsulates a Nucleotide Analog NV-485 within NV-387 Polymeric Micelles)



A Note on Nomenclature of nanoviricides:

The general form is: NV-XXX-c-YYY-g-ZZZ . In this, NV-XXX is the base polymer to which Covalently ("-c-") attached is the ligand NV-YYY (if present); and in the resulting polymer, the guest API ("-g-") NV-ZZZ (if present) is encapsulated or complexed in.

NV-387

NV-387 is a Host-side Sulfated-ProteoGlycan-Mimetic Nanoviricide

**Its Activity Spectrum Includes:
Influenza Viruses* including H5N1 Bird Flu**,
Coronaviruses (incl. COVID, Long COVID-virus associated),
RSV, as well as
Poxviruses**

**Potentially Activity Anticipated Against:
Dengue Viruses, Hendra-Nipah Viruses,
and Many Other Viruses**

* Influenza Viruses Use Heparan Sulfate as the Attachment Receptor,
Followed by Sialylated Glycoproteins as the “Cognate” Receptor(s).

** All Highly Pathogenic (Avian) Influenza Viruses, e.g. H5N1 “Bird Flu”, Possess
a Multi-Basic Site (or Polybasic Site) in their HA
that has natural high electrostatic affinity to Sulfated Proteoglycans and to NV-387.
The Multi-Basic Site is Responsible for the High Pathogenicity!
NV-387 is Expected to Possess Strong Activity Against HPAI.

NV-387 Safety Studies

NV-387 Safety is Established in Non-Clinical Studies:

Non-Immunogenic;

Non-Allergenic

Non-Mutagenic

Non-Genotoxic (In-Vitro MNT)

NOAEL 1,200 mg/Kg and MTD 1,500 mg/Kg for IV in Rats

No Adverse Effects in Micro-Histology

GLP Cardiotoxicity Study in Cyanomolgus Monkeys (NHP): No Adverse Effects

GLP Neuro-Pulmonary Study in Rats: No Adverse Effects

NV-387 Safety in Phase I Healthy Human Subjects:

SAD and MAD Studies

No Drop-outs

No Reported Adverse Events

Report Pending

NV-387 Pharmacokinetics

Both I.V. and Oral Dosing Result in Sustained, Plateau Plasma Profiles

**Non-GLP PK/TK in Cyanomolgus Monkey (NHP) upon
Slow Infusion Dosing:**

**A Nearly Flat Plateau from 0.5-6h with ~70% Retained at 24h
at Doses of 25, 50 and 100mg/Kg.**

**Non-GLP PK/TK in of Oral Gummies Formulation in Rats and Dogs
Upon Repeated Dosing (Day 1: 2X, Then Days 2-5, 1X)**

**A Nearly Flat Plateau from 0.5-8+h Followed by:
On First Dose, Total Clearance by 12 h.
On Sixth Dose, Total Clearance by ~24-36 h.**

Increased Dosing Extended Time to Clearance.

cGMP-Compliant Manufacture at Clinical Scales

**NV-387 Scale-Up in Stirred-Tank Reactors to
~5-6Kg Drug Substance Scale Completed**

**NV-387 Clinical Drug Products -
Oral Syrup and Oral Gummies (500mg, 1g Strengths)
Multi-Kg Scale
Formulated, Filled, Packaged, Labeled and Shipped
for Phase I Clinical Trial**

**NV-HHV-1 cGMP-Compliant Drug Product -
Skin Cream Formulation
Multi-Kg Scale
Formulated, Filled, Packaged, Labeled and Shipped
for Non-Clinical IND-Enabling GLP Safety/Tox Studies**

**Additionally, We Have
On-Site Class 100 Clean Rooms for
Injectables, Inhalation, and Ophthalmic Drug Formulations**

NV-387 Phase I Clinical Trial of NV-387 Oral Syrup and Oral Gummies Completed Successfully

- Clinical Trial for COVID Indication Conducted In India, by the Drug Sponsor and Our Collaborator, Karveer Meditech Pvt. Ltd.
- In-Hospital Stage Completed ca. end of December, 2023
- No Drop-Outs
- Clinical Observations: Well Tolerated, No Findings, No Reportable Adverse Events
- Additional Data Will be Available - Pending Analysis and Reporting

NV-387 Phase I Clinical Trial of NV-387 - Design

- Two Formulations (Oral Syrup and Oral Gummies); 3 Dose Levels Each
 - 10 mg/Kg, 20 mg/Kg and 40 mg/Kg Oral Syrup
 - 500 mg, 1,000 mg and 2,000 mg Oral Gummies
 - Total 6 Cohorts at SAD and MAD; 6 Healthy Subjects per Cohort
 - All Subjects Sequestered in Hospital in an Isolated Ward Until Discharge
- Phase Ia, Single Ascending Dose (SAD): 36 Healthy Volunteer Subjects
- Phase Ib, Multiple Ascending Dose (MAD): 36 Healthy Volunteer Subjects
 - MAD Design: Double (Loading) Dose on Day 1, then 1X Dose on Days 3, 5, 7, 9 (Total Exposure Equivalent to 6 Doses)
 - A Phase Ib-COVID Treatment Part i.e. MAD with COVID Patients was planned, but could not be executed because of lack of PCR Positive Patient Recruitment, despite addition of a 2nd Site
 - Phase Ia/Ib Healthy Subjects is Now Closed

NV-387, A Single Drug that is Effective Against a Diverse Family of Viruses: In Lethal Animal Infection Models NV-387 is Superior to Existing Drugs

Virus Family	Virus	Animal Model	Survival, Days	% Improvement in Survival, Compared to Reference Drug
RSV	RSV, A2	Balb-c Mice Lethal Lung Infection	NV-387, PO = Full Survival VS. Ribavirin, PO = 13.8 Days Vehicle, PO = 7 Days	NV-387, PO, Led to Full Survival, Possibly Cured, vs. Ribavirin Increased Survival by only ~ 7 Days
Influenza	Influenza A / California/2/2014 (H3N2)	Balb-c Mice Lethal Lung Infection	NV-387, PO = 15 Days VS. Oseltamivir, PO = 10 Days Baloxavir, PO = 11 Days Peramivir, I.V. = 11 Days Vehicle = 8 Days	NV-387, PO = 350% vs. Baloxavir, PO = 150% Peramivir, IV = 150% Taking Oseltamivir, PO = 100%
Corona-viruses	hCoV-NL-63 (SARS-CoV-2 Surrogate)	Rat Lethal Lung Infection	NV-387, IV = 14 Days NV-387, PO = 8.4 Days VS. Remdesivir/SBECD, IV = 7 Days Vehicle, IV = 5 Days	NV-387, IV = 450% NV-387, PO = 170% Taking Remdesivir = 100%
Orthopox Viruses (Smallpox/ MPox)	Ectromelia	SCID-Balb-c Mice Lethal Lung Infection	NV-387, PO = 14 Days NV-387-m-T (*), PO = 16 Days VS Tecovirimat, PO = 11 Days Vehicle, PO = 7 Days	NV-387, PO = 175% NV-387-m-T, PO = 225% Taking Tecovirimat, PO = 100%
		* NV-387-m-T: Tecovirimat Mixed into NV-387; demonstrates that their orthogonal mechanisms enable improved effect, when taken together.		

NV-HHV-1 Further Developments (HerpeCide™ Program)

- IND - NV-HHV-1 Skin Cream for the Treatment of Shingles Rash
- Non-Clinical Development of Systemic NV-HHV-1 and NV-HHV-2
- Phase I/II - NV-HHV-1 Skin Cream for the Treatment of Shingles Rash
- Phase I/II - NV-HHV-1 or NV-HHV-2 for the Systemic Treatment of HSV-1, HSV-2 and Shingles Infections
- Expand NV-HHV-1, NV-HHV-2 to Other HerpesVirus Infections

NV-HIV-2 Further Developments

- Non-Clinical Development of Systemic NV-HIV-2
- Phase I/II - NV-HIV-2 for the Systemic Treatment of HIV-1, HIV-2 Infections
- Goal - First-Line Treatment to Bring Viral Load to Undetectable Levels, Study Length of Treatment Discontinuation Before Retreatment Required

NanoViricides Drug Pipeline

Virus Family	Virus	Drug Candidate & Formulations	Brief Description of Drug	Notes	Indications	Stage
Paramyxo-viruses	RSV	NV-387	NV-387 carries covalently attached multiple copies of mimics of the host-SPG region that interacts with viral entry glycoproteins that enable infection.	- Complete Survival of Lethally Infected Mice from RSV Infection, Compared to Ribavirin that extended lifespan slightly. - There is no current drug to treat RSV infection. \$8 Billion Market Size in the USA.	RSV Infection leading to hospitalization in Adults RSV Infection in Infants and Children	Preparing for Phase II Clinical Trial - RSV in Adults; Pediatrics to Follow
Influenzas	All INFV A, HPAI	Oral Gummies Oral Syrup IV Injection		- Substantially Superior to Existing Drugs (Oseltamivir, Peramivir, Baloxavir) in Animal Model. - Mechanism Orthogonal to Existing	Influenza	Preparing for Phase I/II Clinical Trial
Corona-viruses	SARS-CoV-2, Seasonal CoVs	IV Infusion Solution for Inhalation		- Substantially Superior to Existing Drug Remdesivir in Animal Model. - Mechanism Orthogonal to Others. - No Limitations on Patient Eligibility	SARS-CoV-2, Seasonal CoVs	Ready for Phase II Clinical Trial
Orthopox-viruses	Smallpox, Mpox			- Substantially Superior to Tecovirimat (TPOXX® SIGA) in an Animal Model - US FDA “Animal Rule”: Animal OPV infection studies in 2+ models, & an expanded Phase I clinical trial	MPox Infection (Africa; potential pandemic) Smallpox & Variants (Biodefense/Terrorism Threats)	Preferably collaborate for development
Herpes Viruses	VZV (Shingles, Chicken-pox) HSV-1 HSV-2	NV-HHV-1: Skin Cream Formulation (Oral Drug in Development)		- Effective in Human Skin Patch Model Against Shingles Virus Infection - Safety/Pharmacology Completed for Skin Cream - Effective in HSV-1 Cell Culture and Mouse (in vivo) Models - Preliminary Efficacy Shown in HSV-2 Mouse Model	Primary: Shingles Skin Rash - Topical Post-Herpetic Neuralgia - Topical HSV-1 Cold Sores Topical HSV-2 Genital Ulcers Topical Oral Drug in Development	Preparing for Phase I/II Clinical Trial - Shingles
HIV/AIDS	HIV - All Clades and Mutants	NV-HIV-2 : Injectable, Oral	NV-HIV-2 carries covalently attached multiple copies of mimics of the host-CD4 region that interacts with HIV gp120.	- Highly Effective Against HIV Infection in SCID-Hu-Thy/Liv Mouse Model when Compared with a Triple-Drug-Cocktail - Showed long term benefit post drug stoppage in lethal animal study.	HIV/AIDS	Starting Non-Clinical Pharmacology
Many Other Viruses		Many other Indications (40+) for different disease manifestations from above-mentioned and other viruses. Broad-spectrum nanoviricide antivirals potentially to cover all human, zoonotic, and biodefense viral diseases!				

NanoViricides Encapsulation Platform: NV-387, Already Phase I Completed (DMF Possible)

- Drug Rescue: Rescue Active APIs with Poor Pharmacokinetics/Metabolism
- NV-387 Encapsulation of Drugs or Pro-drugs Provides Many Benefits
- Sustained Pharmacokinetic Profile
 - Enable Twice Daily or Less Frequent Dosing for Oral or Sublingual
 - Potentially Weeks for Subcutaneous (with Highly Active APIs such as Peptides)
- Oral Delivery is Made Feasible - Solid Dosage Form, Oral Syrup Form
- Sublingual Delivery (for Small Quantities) Possible
- Protection of Guest API from Metabolism Over Extended Period
- Increased AUC of Guest API
- Stable at Room Temperature or 2-8°C for Supply Chain Efficiency
- Demonstrated Encapsulation for Remdesivir (RDV), RDV-Prodrug,

NanoViricides Encapsulation Platform: NV-387 with Site-Directing Ligands Attached for Receptor-based Drug Delivery

- NV-387 can be Covalently Modified with Small Chemical Ligands
- Delivery of Guest API to Specific Sites of Action is Made Possible by Receptor-Mediated Drug Delivery Using such Conjugates for Encapsulation
- Antivirals Development Demonstrated : NV-HHV-1&2, NV-HIV-1&2 are Specific Protein-Directed Agents
- Encapsulation of Other Actives as Prodrugs is Feasible
- Expect Additional Benefits of Encapsulation including potentially Oral Delivery, Sustained Release PK, and Protection of Guest API from Metabolism
- Same Technology Applicable to Other Therapeutic Areas - Oncology etc.

NanoViricides is a Unique Drug Developer Company with Its Own cGMP-Capable Manufacturing Capability

- Nanomedicines Characterization Facility
- Virology BSL-2 Certified Lab
- Protect Proprietary Technology & Intellectual Property
- Rapid Transfer from Lab Bench to cGMP Manufacture
- Highly Customizable and Flexible Pharma Manufacturing Capability
- Skin Creams, Eye Drops, Gels, Injectables, Oral...
- Significant Time and Cost Savings
- Potential for Manufacturing Commercial Product: Market Entry & Early Revenues

