



**Bio<sub>2</sub>XyTran** Inc.

# Corporate Overview

# Forward Looking Statement

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# Mission Statement

**Bioxytran** is a clinical stage pharmaceutical company developing platform technologies in the fields of Glycoviropology, Hypoxia and Degenerative Diseases to eliminate viruses and prolong lifespan using carbohydrate drug design.



GLYCOVIOLOGY



HYPOXIA



DEGENERATIVE DISEASES



# Technology Overview

## ProLectin Rx – Glycoviropology

### Virology:

- Covid-19
- Influenza
- Other virologic diseases

### Long term symptoms resulting from viral infections (long-hauler):

- ARDS
- Pulmonary Fibrosis

**ProLectin-M** is a licensed technology that targets COVID-19 mild to moderate cases

## BXT-25 – Hypoxia & Degenerative Diseases

### Ischemia:

- Stroke
- Alzheimer
- Dementia
- Traumatic Brain Injury

### Anemia

### Wound healing

### Oncology and Fibrosis

- Cancer Metastasis
- NASH
- Other Fibrotic condition

### Platform Overlap

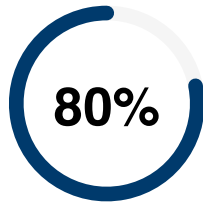
**OXYSENSE** is a licensed technology that uniquely allow the company to prove oxygen delivery to tissue. It will be used in clinical trials as a regulatory end-point



# ProLectin Rx Glycovirology

# Lingering Effects of COVID-19

## Variants are complicating the vaccination strategy



### Herd Immunity

80% level has not been reached



### Vaccination

Not everyone wants to get vaccinated

Not everyone has access to vaccines



### New mutations

Alpha, Delta, Omicron, ?



### Higher risk of death

For at risk population



### Asymptomatic spread

Spreads without showing symptoms

## Vaccinations Unknowns (risks)

- Duration of protection
- Effectiveness against variants
- Frequency of boosters
- Long Term consequences of Immune system

**If herd immunity is unattainable  
Therapeutic treatments are the  
ONLY fall back position**

# ProLectin-Rx Galectin Antagonist Platform



## Versatile

Mutation Agnostic  
Therapeutic



## Tested (Academic Study\*)

No toxicity  
Reduction of viral load to  
undetectable levels



## No Expected Limitations



## Efficient

Quickly eliminates  
contagion

**First line of defense  
against all mutations  
of Coronaviruses**

STATUS:

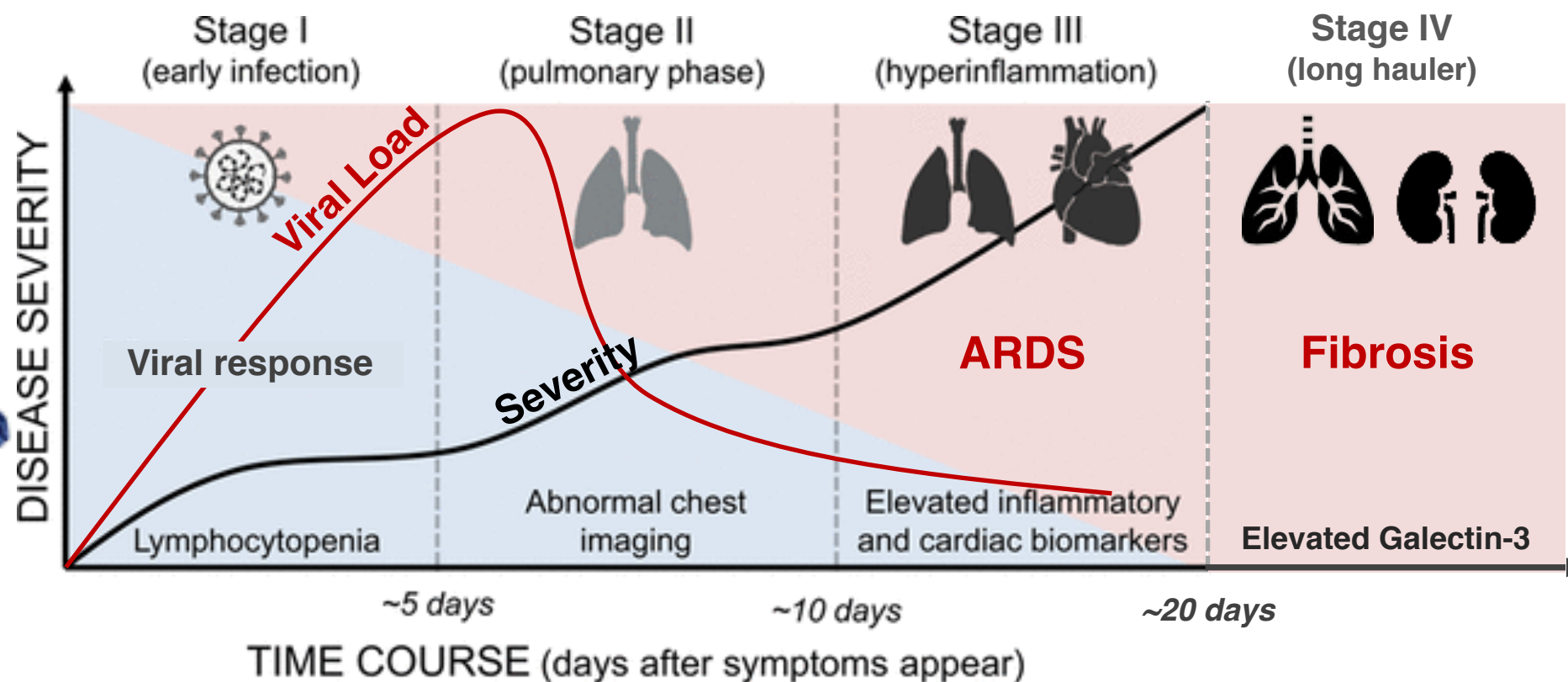
Clinical Trial Stage – **IND Submitted**

\*<https://www.longdom.org/abstract/galectin-antagonist-use-in-mild-cases-of-sarscov2-pilot-feasibility-randomised-open-label-controlled-trial-61087.html>



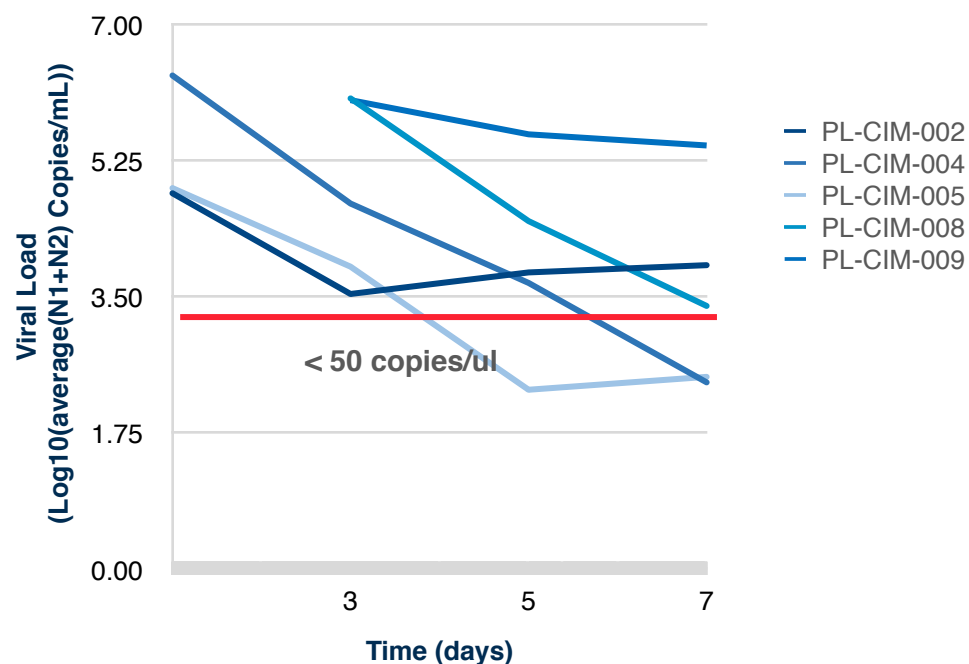
# End-to-End Solution

Treatment	ProLectin-M Oral	ProLectin-I Intravenous	ProLectin-A Intravenous	ProLectin-F Intravenous
Combination			MDX-Viewer	



# Patients Treated With Galectin Antagonist Experienced Reductions In Viral Load

## Viral Load Vs. Time in Treated Patients



Day	N1+N2 Copies/mL			
	1	3	5	7
PL-CIM-002	137080	6970	13180	16340
PL-CIM-004	4468590	101170	9660	510
PL-CIM-005	159730	15630	410	600
PL-CIM-008	N/A	2268630	60180	4890
PL-CIM-009	N/A	2154530	783750	563430

Patient 9 appeared to be an anomaly. Additionally, Patient 8 had no PCR measurement of viral load on day 1, so day 1's PCR measurement was assumed to equal day 3's measurement.

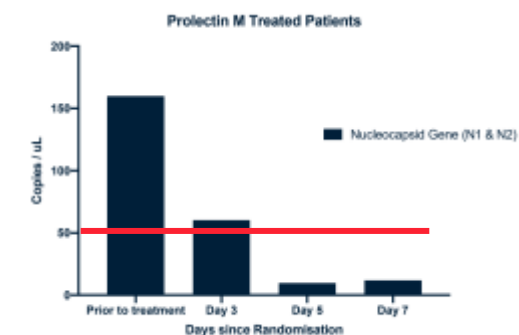
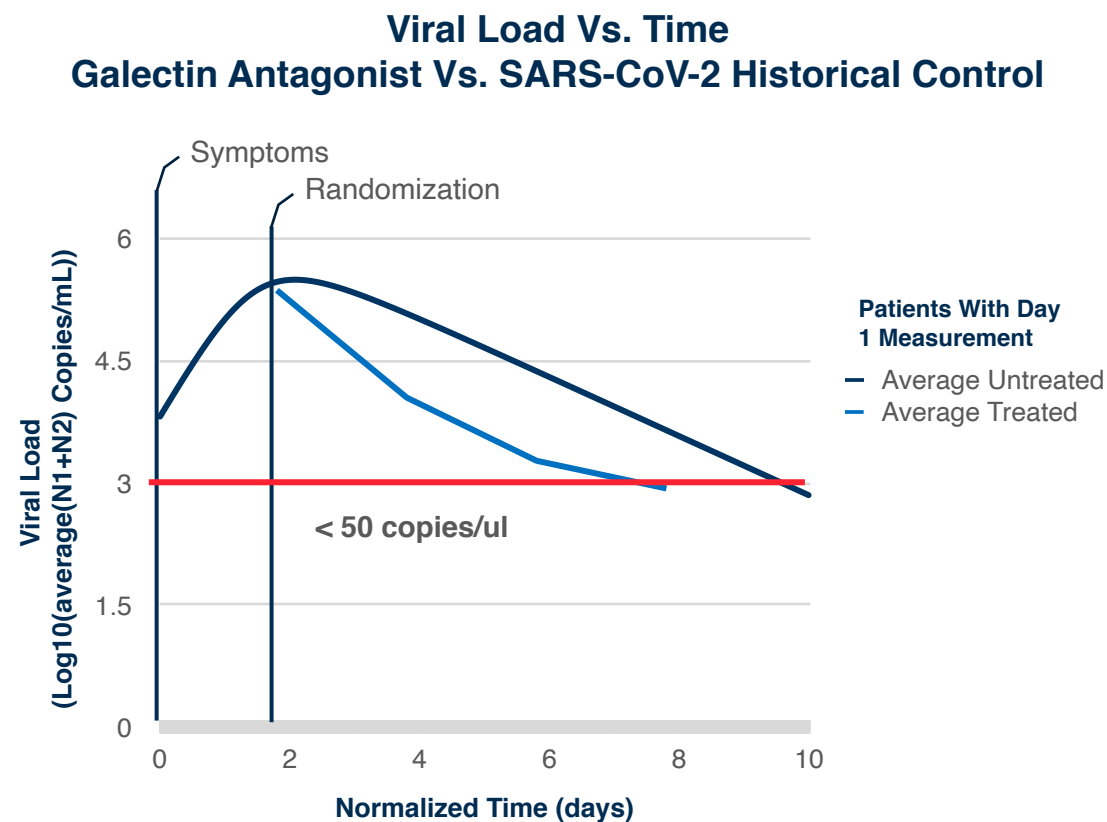


Figure 3 – drop in absolute copy numbers of nucleocapsid gene over time – Treated group

# Viral Curve Comparison



Historical control is taken from a mathematical model using longitudinal data across four different studies of symptomatic, untreated cases<sup>1</sup>

Assumed symptom onset at a viral load of 6500 copies/mL (i.e.  $\log_{10}(3.81)$ )<sup>1</sup>

Patients treated within 2 days of symptom onset (average 1.80 days)<sup>2</sup>

Upper and lower bounds of the model are 95% confidence interval<sup>1</sup>

<sup>1</sup> [A quantitative model used to compare within-host SARS-CoV-2, MERS-CoV, and SARS-CoV dynamics provides insights into the pathogenesis and treatment of SARS-CoV-2 \(plos.org\)](https://doi.org/10.1371/journal.pone.0171111)

<sup>2</sup> [Galectin Antagonist use in Mild Cases of SARS-CoV-2; Pilot Feasibility Randomised, Open Label, Controlled Trial \(longdom.org\)](https://doi.org/10.1186/s13063-022-03000-0)



# Galectin Antagonist Treatment Results in SARS-CoV-2 Spike Protein Specific Antibody Immunity

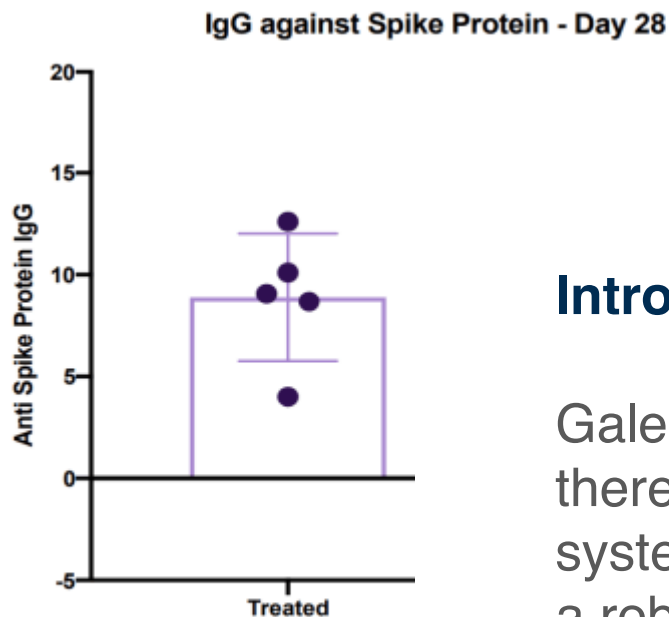
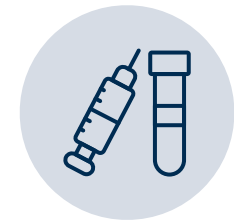


Figure 4 – difference in IgG on day 28

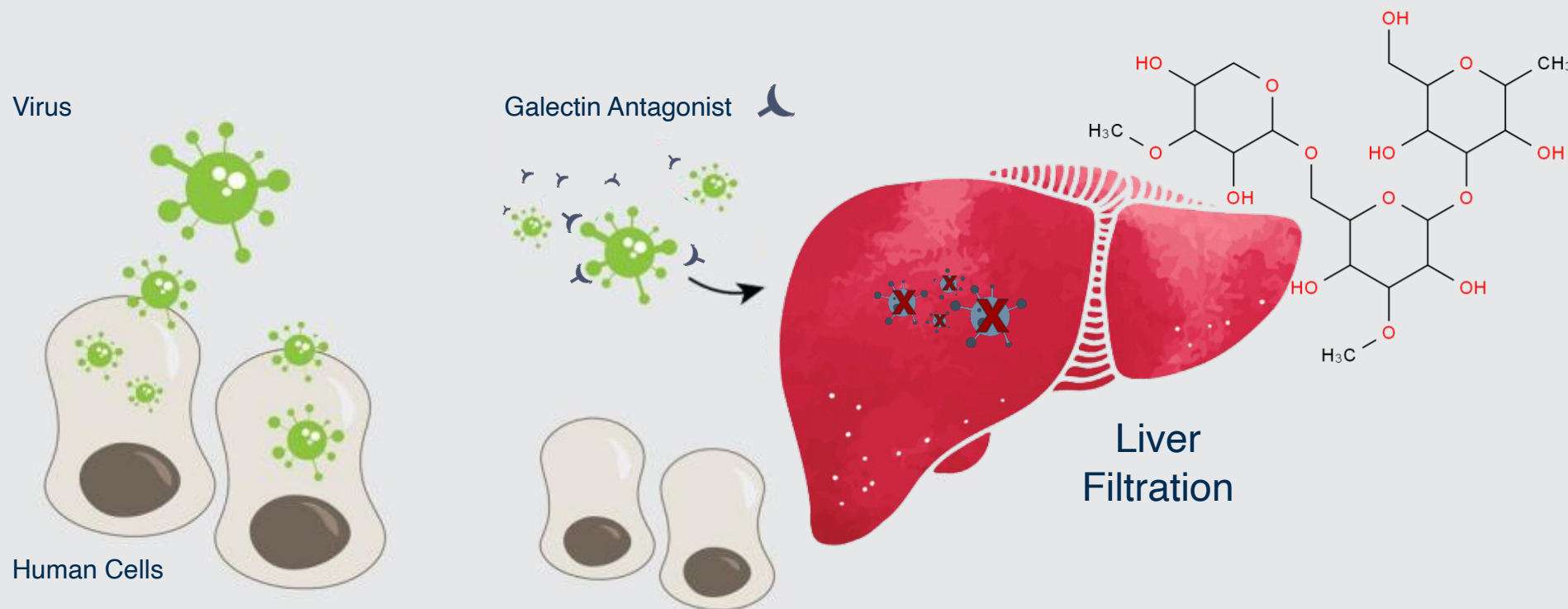
## Introducing Post Infection Immunization

Galectin antagonists clear the blood of viral load thereby reducing the strain on the **Innate** immune system so the **Adaptive** immune system can build a robust response toward future infection.



# Galectin Antagonists Tags Virus For Elimination

## Theoretical Mechanism of Action



# Clinical Research

## Galectin Antagonist use in Mild Cases of SARS-CoV-2: Pilot Feasibility Randomised, Open Label, Controlled Trial

👤 Alben Sigamani\*, Mathu Ruthra, Sudhishma, Samarth Shetty, Madhavi, Anup Chugani, Hana Chen-Walden, David Platt and Thomas Kutty

**Importance:** Novel SARS-CoV-2 virus has infected nearly 100 million people across the world and is highly contagious. There is a need for a novel mechanism to block viral entry and stop its replication.

**Background:** Spike protein N Terminal Domain (NTD) of the novel SARS-CoV-2 is essential for viral entry and replication in human cell. Thus the S1 NTD of human coronavirus family, which is similar to a galectin binding site-human galactose binding lectins, is a potential novel target for early treatment in COVID-19.

**Objectives:** To study the feasibility of performing a definitive trial of using galectin antagonist-Prolectin-M as treatment for mild, symptomatic, rRT-PCR positive, COVID-19.

**Main outcomes and measures:** Cycle threshold (Ct) value is number of cycles needed to express fluorescence, on real time reverse transcriptase polymerase chain reaction. Ct values expressed for RNA polymerase (Rd/RP) gene+Nucleocapsid gene and the small envelope (E) genes determine infectivity of the individual. A digital droplet PCR based estimation of the Nucleocapsid genes (N1+N2) in absolute copies/μL determines active viral replication.

<https://www.longdom.org/abstract/galectin-antagonist-use-in-mild-cases-of-sarscov2-pilot-feasibility-randomised-open-label-controlled-trial-61087.html>



# Proposed Clinical Trial Design



## Clinical Trial

- 408 participants
- Double Blind Randomized Controlled Trial (DBRCT)
- Change in seropositivity at day 14
- Broad inclusion criteria (Vaccination status irrelevant)

U.S. National Library of Medicine  
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Trial record 2 of 2 for: **proleclin-m**

[Previous Study](#) | [Return to List](#) | [Next Study](#)

**PROleclin M, a Nucleocapsid Terminal GateCTin Antagonist for COVID-19 (PROTECT)**

ClinicalTrials.gov Identifier: **NCT05060052**

The safety and scientific validity of this study is the responsibility of the study sponsor and investigators. Listing a study does not mean it has been evaluated by the U.S. Federal Government. [View the risks and potential benefits](#) of clinical studies and talk to your health care provider before participating. Read our [disclaimer](#) for details.

**Sponsor:**  
Parnapactin Inc.

**Collaborators:**  
ALKE RESEARCH PRIVATE LIMITED  
Research Consultancy

**Information provided by (Responsible Party):**  
DR ALBEN SUGAMANI, Parnapactin Inc.

[Study Details](#) [Tabular View](#) [No Results Posted](#) [Disclaimer](#) [How to Read a Study Record](#)

**Study Description** [Go to](#)

**Brief Summary:**  
A galectin inhibitor that prevents viral replication of the SARS-CoV-2 virus through blocking the specific terminal on the surface that enables the virus to enter human cells. This inhibitor - **Proleclin M** is a novel substance that is given orally to individuals who have an infection with SARS-CoV-2 or COVID-19 disease. The oral tablet is chewed every hour for the first 14 days. We hypothesize that patients receiving the active investigational product (ProleclinM) will have a faster recovery from COVID-19 compared to those receiving its matching placebo. The trial is approved by Institutional Review Board for safety and all participants will need to provide a written informed consent to volunteer in this trial. The safety of Proleclin is established as the drug substance is recognised as a safe substance. However its benefits in relieving patients from the COVID-19 infection and providing the patients faster recovery from its clinical symptoms and prevention of delayed sequelae of the infection has not been proven yet.

Condition or disease	Intervention/treatment	Phase
COVID-19 COVID-19 Pandemic COVID-19 Respiratory Infection SARS-CoV2 Infection Cytokine Release Syndrome	Drug: Galactomannan Drug: PLACEBO	Phase 2

**Study Design** [Go to](#)

**Study Type**: Interventional (Clinical Trial)

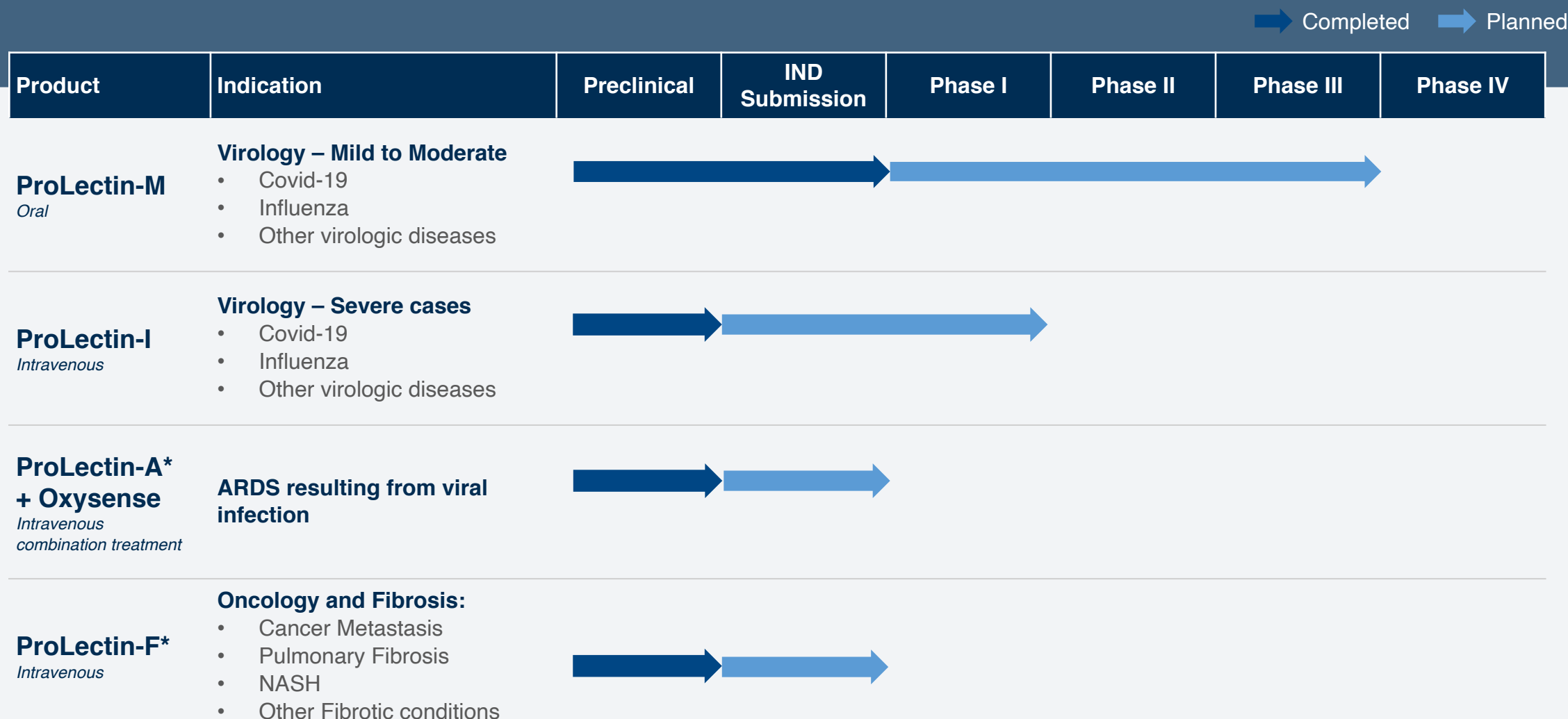
**Estimated Enrollment**: 408 participants

**Allocation**: Randomized

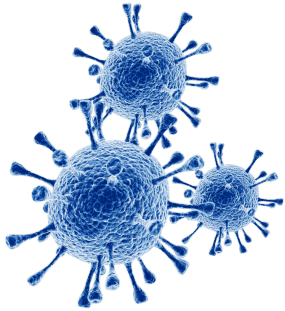
**Intervention Model**: Parallel Assignment

**Masking**: Quadruple (Participant, Care Provider, Investigator, Outcomes Assessor)

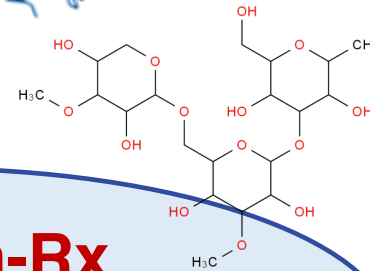
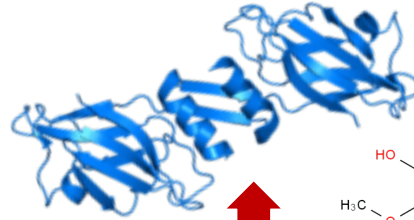
# Glycovirology Development Pipeline



# Therapeutic Approaches for COVID-19



## Immunomodulatory



## Antiretrovirals

(Compete for polymorphism)



## ProLectin-Rx

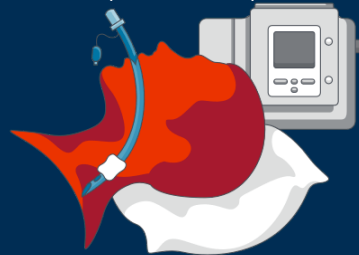
- ❑ Entry Inhibitor
- ❑ Unique Galectin Antagonist – Oral/IV Polysaccharide
- ❑ It's not a vaccine, nor an antiretroviral drug

## Vaccines



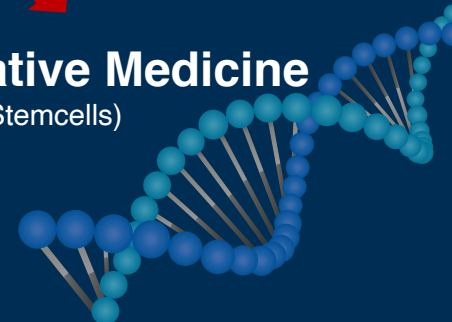
## Oxygenation

(Ventilators)



## Regenerative Medicine

(Stemcells)





# Competitive Landscape

## Oral COVID-19 Therapeutics

Drug	Company	Description	Gov. Award	Clinical stage
Molnupiravir	Merck	Mutagenesis via RdRp – forced mutations induced apoptosis	\$2.2 billion	EUA
Paxlovid	Pfizer	3CL protease inhibitor – Antiviral & Immune sensitization; Ritonovir – inhibitor enhancer	\$5.3 billion	EUA
Tollovir	Todos Medical	3CL protease inhibitor – Antiviral & Anti-Cytokine activity	n/a	Phase 2/3
Tempol	Adamis	RNA-dependent RNA Polymerase (RdRp) via antioxidant & Anti-Cytokine activity	n/a	Phase 2/3

**Governments are End Users of Therapeutics (Big Pharma Involvement - Unnecessary)**

# BXT-25 - Hypoxia & Degenerative Diseases

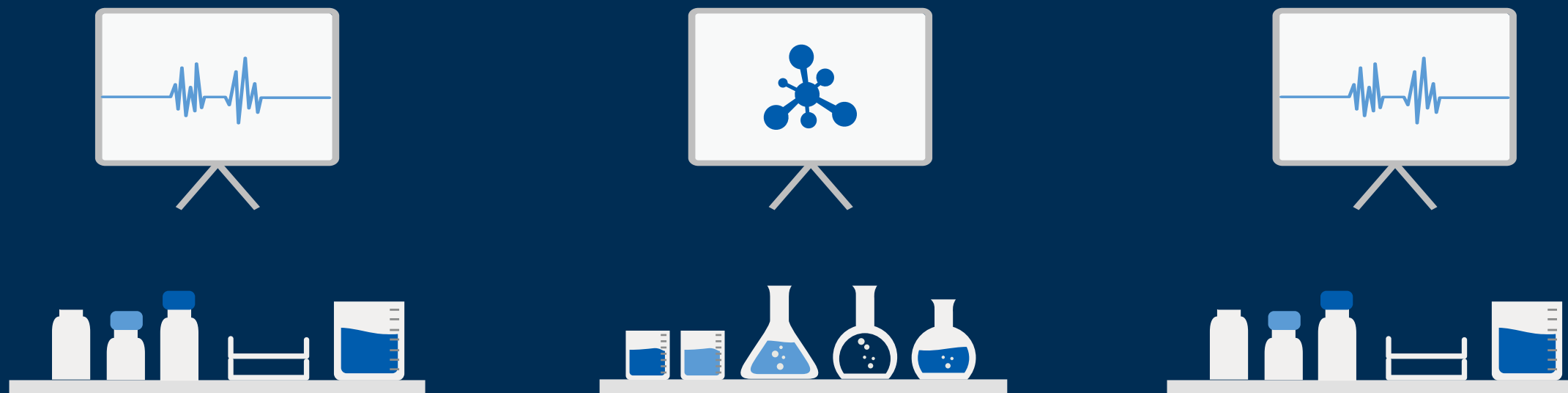
# The Brain Stroke Epidemic

A Challenge to Worldwide Healthcare, a \$500 Billion Medical Indication Costs



Region	Strokes	Population	Survivors	Direct cost	Indirect cost
US	0.8 million	330 million	5.8 million	\$44 billion	\$22 billion
EU (+GB)	1.1 million	515 million	3.4 million	\$28 billion	\$16 billion
CN	2.5 million	1,402 million	7.5 million	estimated \$74 billion	
World (total)	12.2 million	7,700 million	33.0 million	estimated \$500 billion	

# The Golden Hour Dilemma



Onset of symptoms



Ambulance arrives at home



Arrival and initial assessment and treatment in ER



Thrombolysis or PTCA/CABG



Blockage Removed

Time to Needle  
**2.5 hours**  
Equivalent to  
9 Years of Aging\*





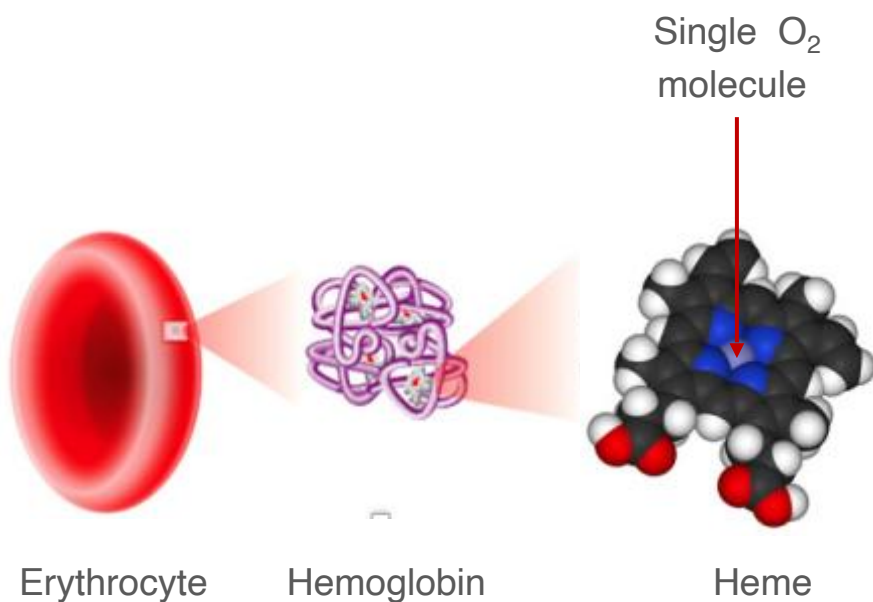
# Solution: BXT-25 an Oxygen Bridge

- BXT-25 is a hemoglobin-based polymer; 5,000 times smaller than a red blood cell
- It can be used both in Ischemic and Hemorrhagic Stroke
- It can penetrate a blood-clot and reach the brain within 3 minutes
- Reduction of average Time-to-Needle by 90%



BXT-25  
polymer

# How It Works? BXT-25 – Stabilized Oxygen-carrying Protein



- Delivered as an IV solution
- Universally compatible with all blood types
- Non-immunogenic
- Low viscosity
- Stable at room temperature
- 3-year shelf-life in liquid formulation
- Extended shelf-life in dry formulation

# Proprietary Manufacturing Process of BXT-25



Collect controlled  
source Red blood cells



Extract Hemoglobin  
Protein



Purify and  
crosslink



Extract Heme and  
reattach to a polymer



BXT-25 is mixed with a  
saline solution, to be IV-  
infused by an ER team

Key Assays for BXT-25 chemical and structural specifications are: Electron spray Ionization, Amino Acid Analysis, Gel Electrophoresis, Circular Dichroism, Reverse phase HPLC and Immunoblotting



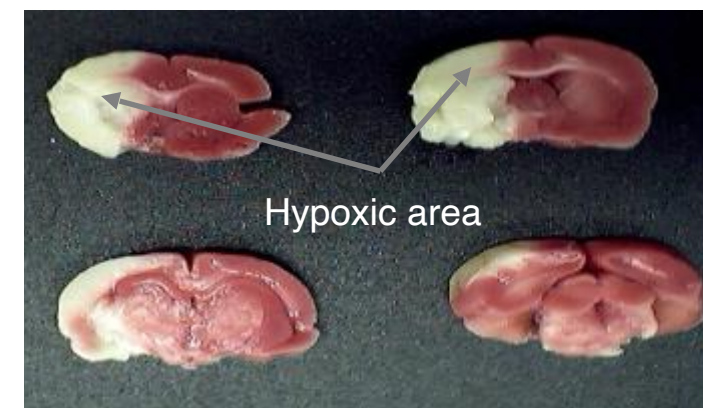
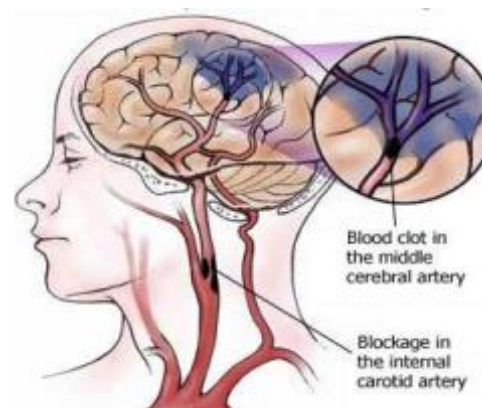
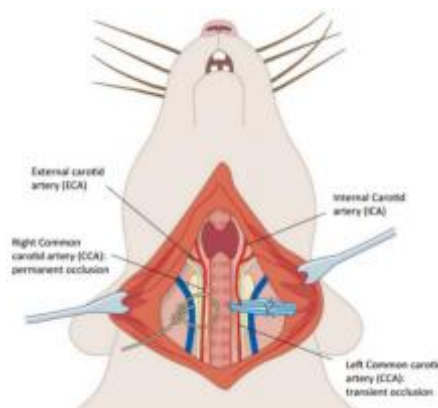
# Proof of Concept of BXT-25 in Animals

Absence of nitric oxide scavenging, no increased blood pressure in diabetic mice (Harvard Medical School, 2013)

Oxygen delivery and brain recovery in stroke induced rats with similar chemistry to BXT-25 (Harvard Medical School, 2013)

No toxicity from replacing 90% of the blood in dogs with similar chemistry to BXT-25: (QTest Labs, Columbus OH, 2014)

## Middle Cerebral Artery Blockage Model in Rats





# Limited Effective Treatment Options



Our competition is tPA and similar drugs, aiming to dissolve, or remove, a clot. These are time-consuming and require an MRI since blood-thinners are fatal in hemorrhagic strokes.

**THERE ARE NO  
DRUGS AVAILABLE TO  
DELIVER OXYGEN TO  
THE BRAIN**

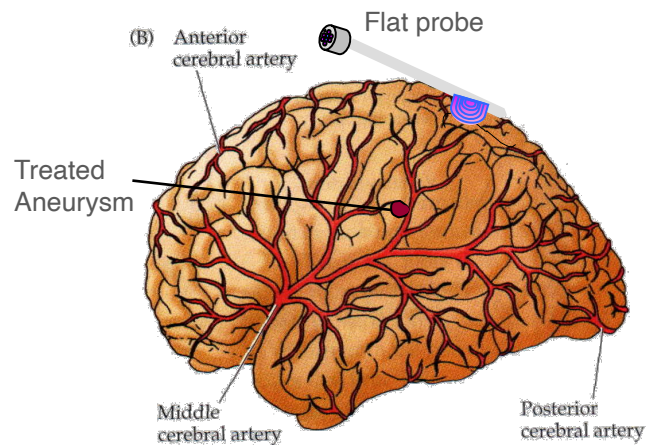
Drug	Company	Description
rtPA	Genentech, Johnson & Johnson	Thrombolytic agent used to break apart blood clot that causes ischemic stroke
Abciximab	Eli Lilly /Centrocort	Platelet aggregation inhibitor
Cerovive	AstraZeneca	Nitron based neuro protectant
Candesartan	AstraZeneca	Angiotensin receptor blocker (ARB)
Ancrod	Knoll Pharmaceuticals	Anticoagulant that acts by breaking down fibrinogen

BXT-25 is designed to support the oxygenation of the brain until the clot is dissolved by medication or removed by surgery

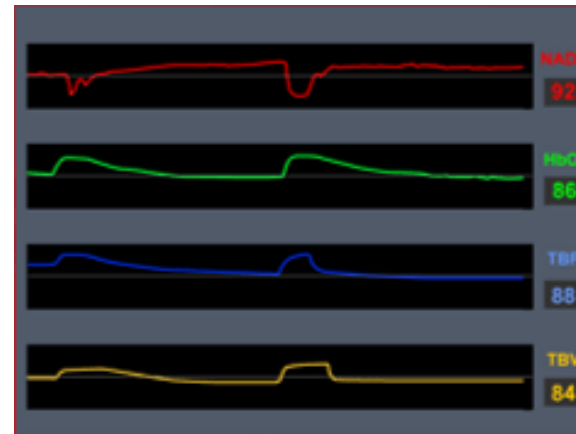
# How Do We Measure Tissue Oxygen Level?

# FDA Approved Companion Diagnostics

OXYSENSE - A clinical end-point for measuring oxygen delivery to the brain in real-time



Tissue/brain monitored parameters



Mitochondrial NADH (ATP)

Hb Saturation (O<sub>2</sub>)

Cerebral Blood Flow

Tissue Reflectance



Tissue metabolic score

90

Brain metabolic score



Measures real time tissue oxygenation levels



Assists in determining organ viability

# Degenerative Disease/Hypoxia Development Pipeline

➡ Completed ➡ Planned

Treatment/Device	Indication	Discovery	Preclinical	Phase I	Phase II	Phase III	Phase IV
BXT-101	Cancer Metastasis	➡	➡				
BXT-102	NASH <ul style="list-style-type: none"> <li>• Cirrhosis</li> <li>• Fibrosis</li> </ul>	➡	➡				
BXT-251+ Oxysense	Organ Transplantation <ul style="list-style-type: none"> <li>• Preservation agent</li> <li>• Organ monitoring</li> </ul>	➡	➡				
BXT-25	Stroke <ul style="list-style-type: none"> <li>• Ischemic</li> <li>• Hemorrhagic</li> </ul>	➡	➡				
BXT-252	Wound Healing	➡	➡				
BXT-253	Anemia	➡	➡				
BXT-255	Traumatic Brain Injury	➡	➡				



# Business Development & Strategy



# Clinical Trial Strategy

Product	2021				2022			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
ProLectin-M					Pre-clinical Development	Phase I/II	Phase III	
ProLectin-I					Pre-clinical Development		Phase I/II	Phase III
ProLectin-F					Pre-clinical Development		Phase I/II	Phase III
ProLectin-A / BXT-25						Pre-clinical Development	Phase I/II	

# Business Strategy



## Intellectual Property (IP)

- One issued US patent (US6245316B1)
- Two international patents pending approval
- Additional applications to strengthen our IP position are ongoing



## Business Development Strategy

- Collaboration agreement with qualified partner's
- Out-license agreements with Big Pharma

# Big Pharma Licensing Targets

## THERAPEUTIC AREAS

Virology  
Neuroscience

Oncology  
Cardiovascular

Immunology  
Hematology

Respiratory  
Stroke

Inflammation

IDEAL PLATFORM DRUG  
FOR MANY BIG PHARMAS

- **Johnson & Johnson** – Oncology, Neuroscience, Immunology, Cardiovascular, Vaccines, HIV
- **Roche Holdings** – Oncology, Neuroscience, Immunology, Hematology, Ophthalmology
- **Pfizer** – Oncology, Neuroscience, Cardiovascular, Diabetes
- **Novartis** – Oncology, Neuroscience, Immunology, Cardiovascular, Respiratory, Ophthalmology
- **Merck** – Oncology, Neuroscience, Immunology, Cardiovascular, Respiratory, Diabetes, Vaccines
- **Sanofi Aventis** – Oncology, Neuroscience, Immunology, Inflammation, Diabetes, Vaccines
- **AbbVie** – Oncology, Neuroscience, Immunology, Virology
- **GlaxoSmithKline** – Oncology, Immunology, Respiratory, HIV, Vaccines
- **Eli Lilly** – Oncology, Neuroscience, Immunology, Diabetes, Pain
- **Gilead** – Oncology, Respiratory, Hematology, Inflammation, HIV
- **Bristol Meyers Squibb** – Oncology, Immunology, Cardiovascular, Hematology, Inflammation
- **Allergan** – Neuroscience, Ophthalmology, Gastroenterology
- **AstraZeneca** – Oncology, Cardiovascular, Respiratory
- **Biogen** – Oncology, Neuroscience, Inflammation, **Stroke**, Pain
- **Amgen** – Oncology, Cardiovascular, Hematology, Inflammation

# Use of Proceeds

Current Round – S-1	ProLectin-M	ProLectin-I	ProLectin-F	ProLectin-Rx*
Estimated Project Cost in thousands USD*	\$ 2,700	\$ 1,650	\$ 1,000	\$ 5,350
Development & GLP	-	-	-	-
Pre-Clinical	100	150	150	400
IND Submission	150	200	200	550
Clinical Trials	2,000	1,000	500	3,500
G&A	450	300	150	900
End Point	Phase III	Phase II/a	Phase II/a	Total

\* \$2.6 million have previously been spent on proof-of-concept and GMP manufacturing of ProLectin-M, -I, and -F

Future Round	ProLectin-A	BXT-25	Total Upcoming*
Estimated Project Cost in thousands USD*	\$ 10,000	\$ 10,000	\$ 20,000
Development & GLP	3,150	3,150	6,300
Pre-Clinical	1,200	1,200	2,400
IND Submission	300	300	600
Clinical Trials	4,000	4,000	8,000
G&A	1,350	1,350	2,700
End Point	Phase II/a	Phase II/a	Total

# The Team

## Management

**David Platt PhD**, CEO, CSO, Chairman

Carbohydrate chemistry expert, founded four publicly traded companies/3 NASDAQ listings, raised \$150m in public markets, created \$1B in shareholder value, and led development of four drugs candidates.

**Ola Soderquist CPA, MSA, MBA, CFO**

>30 years multi-industry financial experience.

**Mike Sheikh**, EVP BD

>10 years of business development in life sciences. Broker and Research Analyst.

**Veronika Tyukova MBA**, PM Dir

>15 years of PM in Hi-Tech, Manufacturing and Commercialization.

## Board of Directors

**Anders Utter MBA**, Director

Audit Committee Chair, >25 years of managerial finance and accounting in medical devices and manufacturing.

**Dale Conaway DVM**, Director

Veterinary Medical Officer, Federal Research.

**Alan Hoberman PhD**, Director

Executive Director of Site Operations and Toxicology at Charles River Laboratories.

**Hana Chen-Walden MD**, Director

>30 years experience in pharmaceutical regulatory affairs in US and Europe.

## Advisory Board

**Avraham Mayevsky PhD**, Professor Emeritus

Worldwide authority in the field of minimal invasive monitoring of tissue and organ physiology; and professor at the Faculty of Life Sciences, Bar-Ilan University, Israel.

**Alben Sigamani, MD**

Professor and Head of Clinical Research Narayan Health, Bangalore. >17 years of experience in clinical research

**Thomaskutty Alumparambil, C.C.P**

> 30 years of clinical experience that includes heart, lung, and liver transplants.





# Bio<sub>2</sub>XyTran<sup>Inc.</sup>

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