

# Membio

Fueling Life With Blood

Investment Presentation  
**NON CONFIDENTIAL**

Kitchener, May 2019



## Who we are



Membio is a start-up company based out of the University of Waterloo linked incubator Velocity Garage.

## Mission



Ensure the world has a sufficient supply of safe blood.

## Technology



By manufacturing blood we can address the acute worldwide blood shortage. We are developing proprietary technology to do that at 1/10<sup>th</sup> the cost of current methods.

## Funded by



UNIVERSITY OF  
**WATERLOO**



# A Broken System

*A reliable blood supply is an essential part of any healthcare system. Despite the ubiquity of this critical resource, there has never been enough supply to meet the ever-increasing demand.*

## Supply Shortage

Supply Meets Under  
40% of Demand

## Safety Concerns

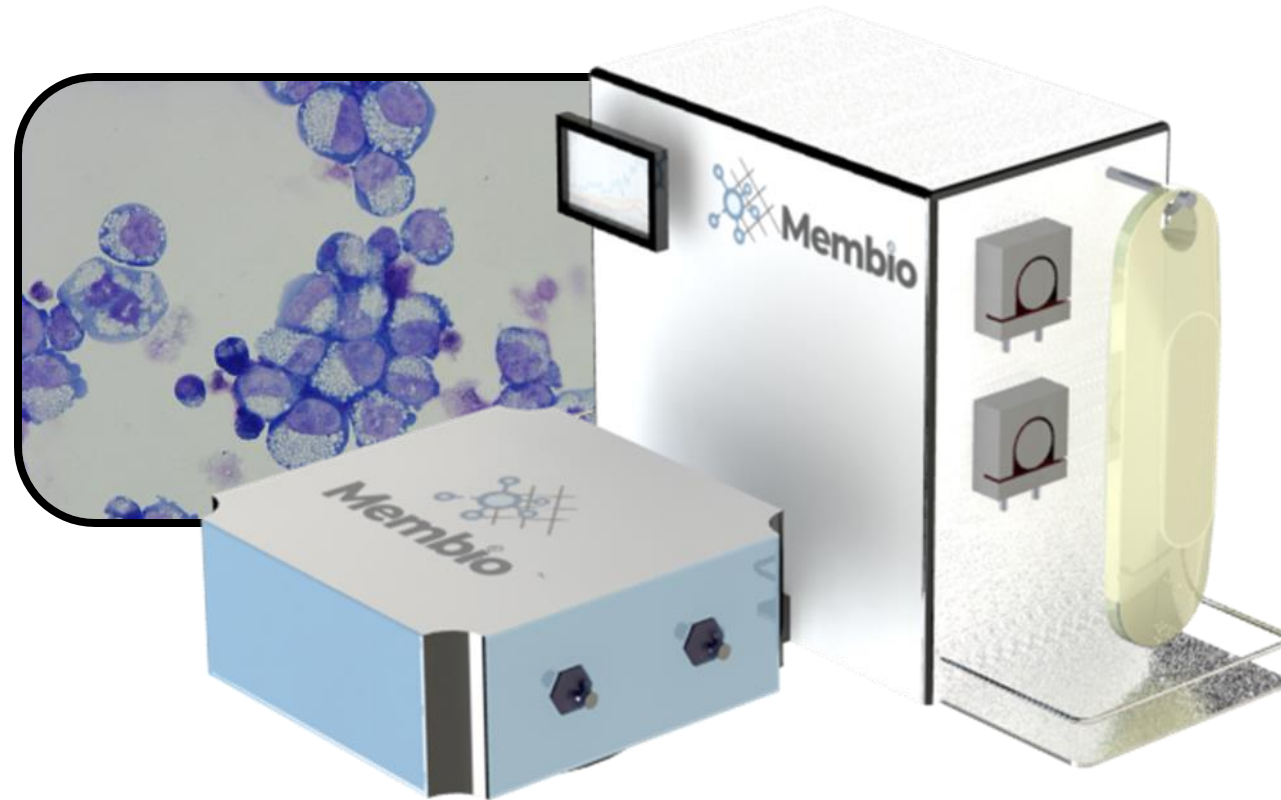
Every Donation Must Be  
Screened

## Unprofitable

90% of Blood Centers in  
USA Lose Money

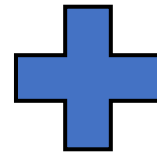
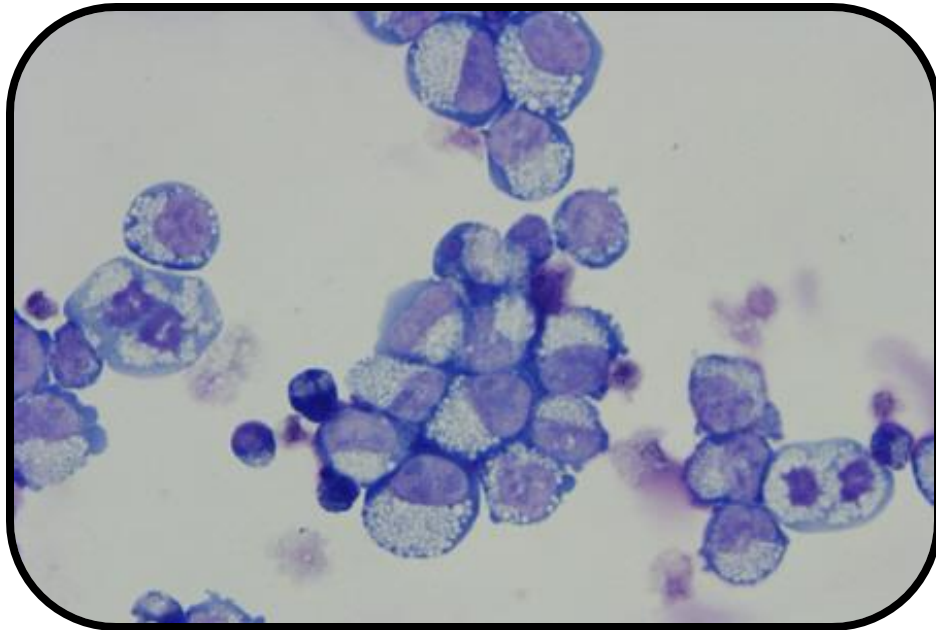


**We Cost-Effectively Manufacture Blood Outside the Body.**



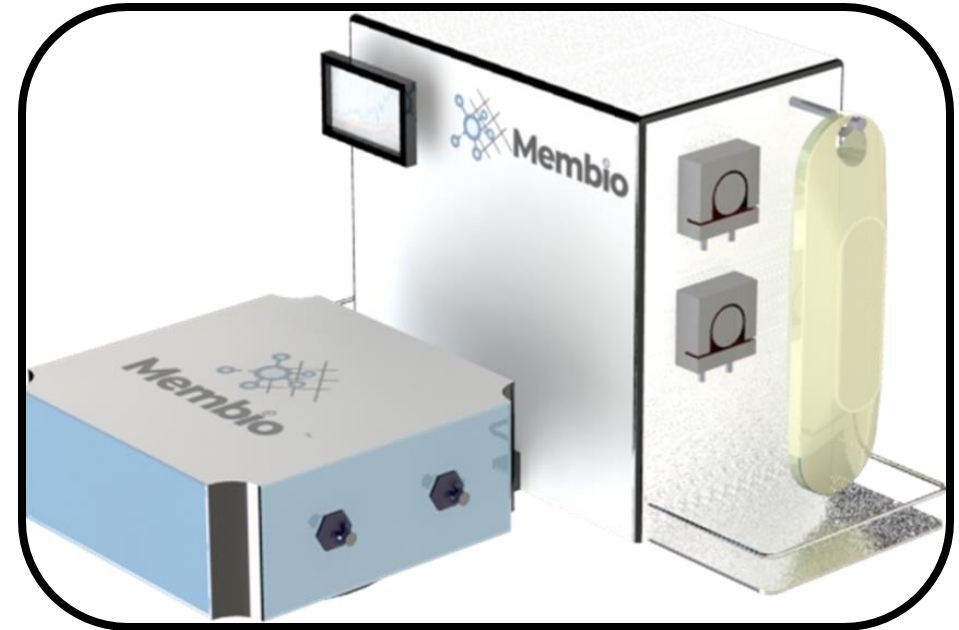
## Immortalized Cells

Committed to Erythropoiesis Pathway



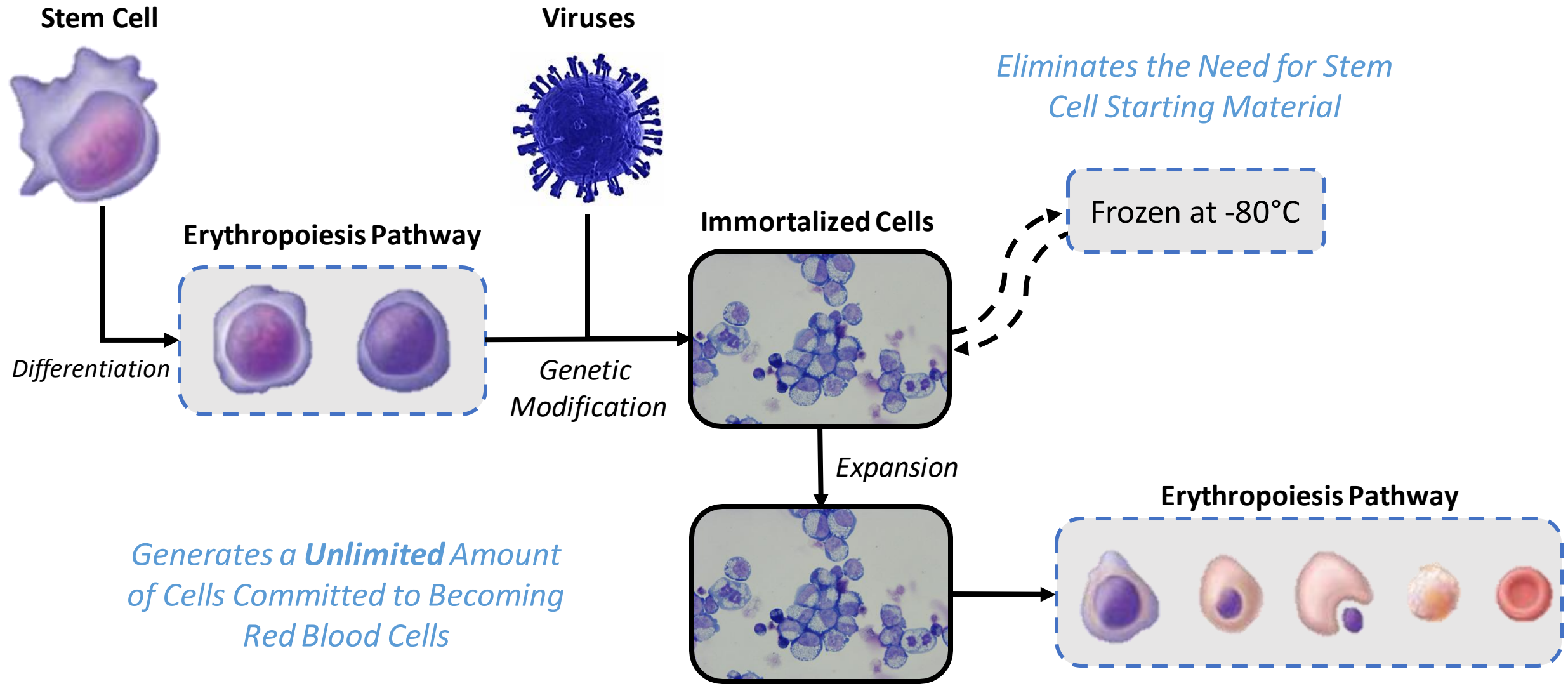
## Proprietary Technology

Significantly Cheaper Manufacturing



# Unlimited Supply of O<sup>-</sup> Blood

# Immortalized Cells



# Our Advantage

## Single-Use Bioreactors

### Perfusion System *\*Patent Pending*

Unlocks unprecedented cell densities by delivering all essential nutrients to every cell regardless of volume.

### Polymer Coating *\*Patent Pending*

Modifies the microenvironment to promote cell growth and product harvest.

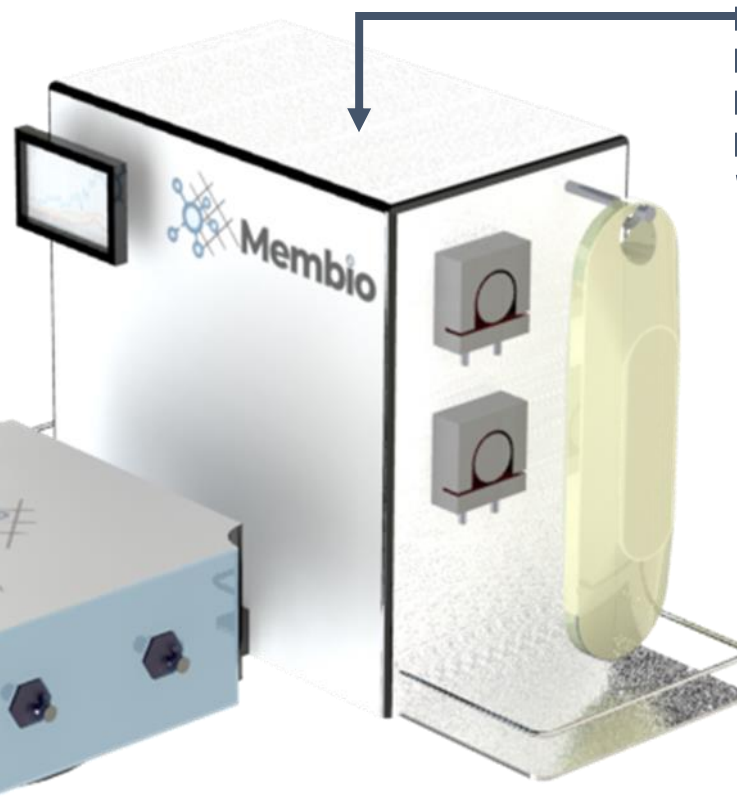
## Control System

### Digital Twin

Creates a real-time 3-D rendering of the bioreactor environment.

### AI Control System

Automatically modifies the process to guarantee optimal conditions.



Allows for **Cost-Effective**  
Manufacturing on an  
Industrial Scale



# Complete Disruption

*Our innovative approach of manufacturing blood will eliminate blood supply shortages and unsafe transfusions while effectively disrupting a fundamental element of every healthcare system.*

## Supply Shortage

Collected: 112.5  
**Manufactured: 190**  
Required: 300+  
Shortage: 0



**Supply Shortage  
Eliminated**

## Safety Concerns

HIV/AIDS  
Hepatitis B & C  
Syphilis  
Bacteria  
Emerging Pathogens



**Manufactured Blood is  
100% Safe**

## Complexity

Manufacturing



Hospital



Patient



**Increased Efficiency and  
Profitability**







**Military**



**Healthcare**



**International Aid**

## Blood has Over 600 Markers Belonging to 30+ Groups

### Normal Blood Types

Blood Group	
<i>ABO</i>	<i>Rhesus</i>
AB	-
	+
A	-
	+
B	-
	+
O	-
	+

### Rare Blood Types

< 1% of Population  
can be Donors



Extremely Limited Supply



**Greater Need and Price**



## Red Blood Cells

Average Price: \$334 USD/Unit  
Global Demand: 300,000,000 Units  
**Market Size: \$100 Billion**

Unmet Market Size  
**\$62.5 Billion**

## Rare Blood Types

Average Price: \$750 USD/Unit  
Demand: 900,000 Units

Market Size  
**\$675 Million**

## Revenue Streams

### *Primary*

Recurring Sales of  
O<sup>-</sup> Blood Units

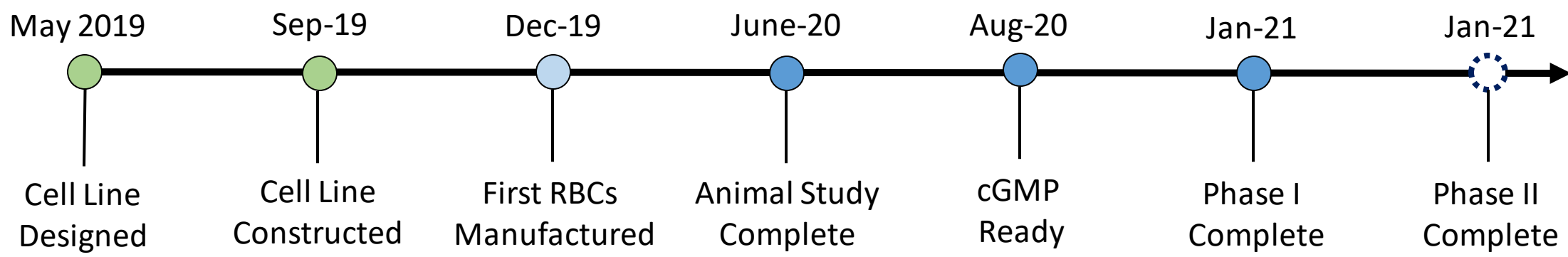
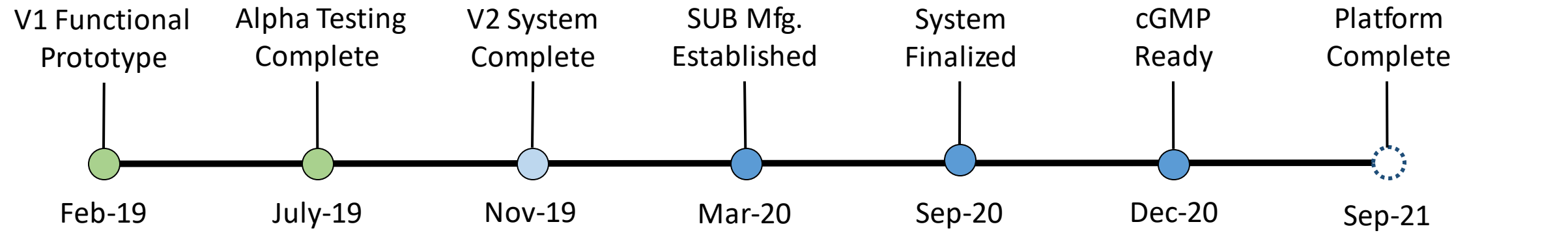
### *Secondary*

Sales and Licensing of  
Manufacturing Platform



# Development Timeline

## Manufacturing Technology



## Cell Line and Blood Product

# Our Team



## Krzysztof Szablewski

Cell Culture Scientist

*MSc. Medical Science*

*BSc. Biology*

## Shane Kilpatrick

Founder & CEO

*Master's of Business (MBET)*

*MASc. Chem Eng*

*BSc. Biology*



## Moin Ahmed

Polymer Engineer

*MASc. Chem Eng*

*BASc. Nano Eng*

## Murtaza Bahrainwala

Lead Hardware Engineer

*BSc. Bio Eng (Mechatronics)*



# Advisors



**Scott Pundsack**  
Senior Counsel at BLG  
*IP and Manufacturing*



**David Simakov PhD**  
Assistant Professor at UW  
*Modeling and Process Control*



**Adrien Côté PhD**  
Science Lead at Velocity  
*Chemistry and Polymers*



**Jay Shah**  
Director of Velocity  
*Finance and Strategy*



*Regulatory Compliance*



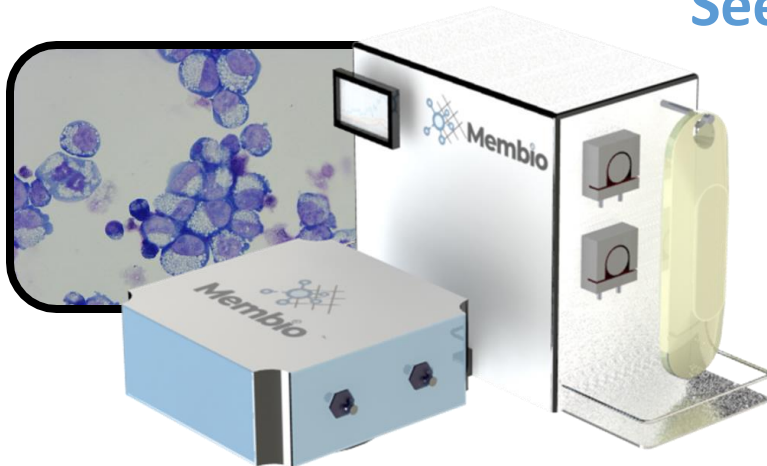
*Hematology*



## *Why Membio?*

**Functional Prototype**  
**Defined Development Plan**  
**Significant Unmet Market Need**

Seeking 300K in Pre-Seed Investment

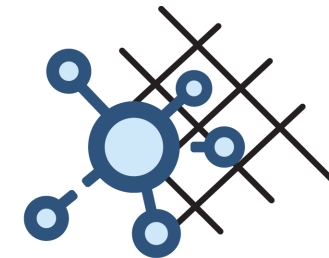


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