

C1 Protein Production Platform

Addressing Vaccine & Drug Shortfalls Through Better Science

September 2021

MAKING HEALTHCARE ACCESSIBLE & AFFORDABLE

Safe Harbor Regarding Forward-looking Statements

Certain statements contained in this presentation are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, including those regarding Dyadic's expectations, intentions, strategies and beliefs pertaining to future events or future financial performance. Actual events or results may differ materially from those in the forward-looking statements as a result of various important factors, including those described in Dyadic's most recent filings with the SEC. Undue reliance should not be placed on the forward-looking statements in this presentation, which are based on information available to us on the date hereof. Dyadic assumes no obligation to update publicly any such forward-looking statements, whether as a result of new information, future events or otherwise. For a more complete description of the risks that could cause our actual results to differ from our current expectations, please see the section entitled "Risk Factors" in Dyadic's annual reports on Form 10-K and quarterly reports on Form 10-Q filed with the SEC, as such factors may be updated from time to time in Dyadic's periodic filings with the SEC, which are accessible on the SEC's website and at www.dyadic.com

Our Mission, Transforming Biomanufacturing

“To improve how we feed¹, fuel¹, and heal the world by utilizing modern biotechnology to revolutionize science, medicine, agriculture¹, and engineering. To provide a cost-effective solution to increase biomanufacturing outputs and satisfy the growing demand for protein production and unmet needs for affordable biologic drugs, vaccines and other biologic products and processes.”



1 Dyadic has achieved certain parts of the above “Mission” through its twenty plus years of experience in industrial biotech. Currently, we are primarily focused on animal and human health applications while opportunistically exploring if and how we may enter/re-enter certain industrial biotechnology applications.

Dyadic At-a-Glance

Re-engineering GMP Vaccine & Drug Production

- Proprietary & patented biologic and vaccine production platform (the “C1 Platform”), designed to bring biologic vaccines and drugs to market faster, in greater volumes, at lower cost
- The C1 platform is de-risked, with a safe and long track record in industrial protein manufacturing

Value Creation Through Technology Licensing, Co-Development Partnering and Wholly Owned Product Development

Market Capitalization	\$168.5 million (as of 09/07/2021)
Cash & Investment-grade securities, including accrued interest	\$25.8 million (as of 6/30/2021)
Shares Outstanding	~ 28.1 million (as of 8/11/2021)
Debt and Warrants	None
Insider Ownership	~30%
2021 R&D Revenue 6 Months	\$1.4 million (YoY 66% increase)



NASDAQ
DYAI



HEADQUARTERS
Jupiter, Florida



HISTORY
Founded In 1979



RESEARCH LOCATIONS
Finland, Spain, US & Others

Investment Highlights

Solid Financial Position with \$25.8 million in cash and investment securities, no debt¹

Harnessing the power of C1 fungi to transform manufacturing of vaccines and other therapeutics

Versatile Platform

C1 protein production is a platform technology, with the potential to disrupt the manufacturing of sub-unit vaccines, therapeutics, enzymes and other peptide, protein and glycoprotein-based products

Strong Competitive Advantage & IP Position

Robust scientific data demonstrating high productivity, stability, and purity.
DuPont grant back of former Dyadic patents & five provisional/patent applications

Large Addressable Market Ready for Disruption

Vaccine and therapeutic manufacturing for humans and animals remains a broad addressable market with many shots on goal and ready for disruption

Global Strategic Partnerships

Funded partnerships with top-tier global biological R&D organizations, human and animal health pharmaceutical companies, as well as governmental and private agencies

Experienced Leadership

Highly experienced and energized professional management team and world-class Board of Directors & Advisors

Management & Directors With Track Record Of Success/Value Creation

Highly Energized Management Team With Deep Industry Expertise & Products In Market

Active Board with Decades of Relevant Experience in Biomanufacturing



Mark Emalfarb

Founder, CEO

Serial Entrepreneur, Inventor 25+ U.S. and foreign biotechnology patents, filamentous fugal enzyme product commercialization



Ronen Tchelet

CSO

20+ years in Biopharmaceutical Industry & Recombinant Product Commercialization



Ping Rawson

CFO

20+ years of finance, accounting & international trade and business development experience



Matthew Jones

CCO

20+ years life professional management, business development and leadership of biopharma products



Dr. Arin Bose

Board Member

34 years bioprocess development and clinical manufacturing



Dr. Barry Buckland

Board Member

29 years R&D leadership | US National Academy of Engineering



Michael Tarnok

Board Member - Chairman

Seasoned pharma industry finance and operational executive



Patrick Lucy

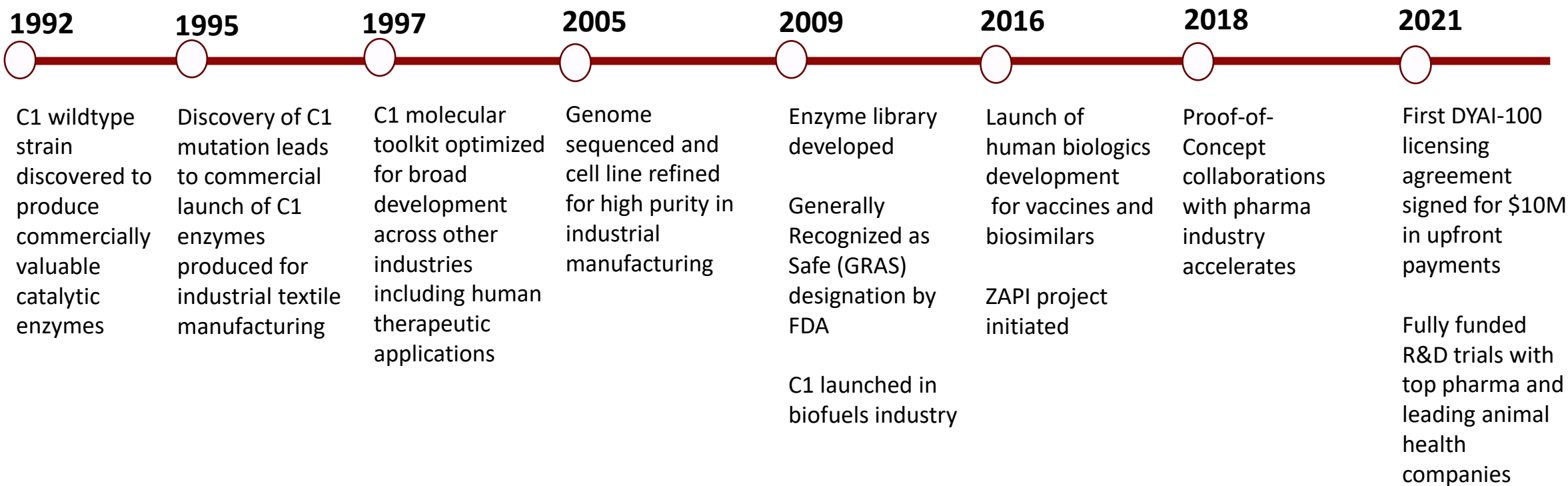
Board Member

20+ years of bioprocess biotech and business development



History of the C1 Platform

“C1” cells are an exceptional strain of genetically engineered fungus – (*Myceliophthora thermophila*) whose usages have expanded through 20 years of commercial engineering



First in human trials are the next step in the C1 platform’s commercial evolution

Establishing Global Presence with Leading Organizations

Co-developing C1 enabled COVID-19 (plus variant) vaccines and/or boosters (i.e., tetravalent or quadrivalent COVID-19 vaccines)



[Sorrento and Dyadic Announce Binding Term Sheet to License Dyadic's Lead COVID-19 Vaccine Candidate "DYAI-100"](#)

Dr. Henry Ji, Sorrento Chairman and CEO, commented, "We look forward to continuing our collaboration with Dyadic, which began last year, initially with a goal of developing and commercializing a protein-based COVID-19 vaccine that can be rapidly manufactured in large quantities in our existing cGMP facilities, and stored and transported at room temperature, in order to increase access and affordability to underserved populations globally."



[Dyadic announces development of COVID-19 Vaccine in India](#)

Mahesh Bhalgat, COO, Syngene International stated, "We look forward to our collaboration with Dyadic to initially explore the development of a COVID-19 vaccine, and to further evaluate the potential of developing a differentiated vaccine platform based on Dyadic's proprietary C1- cell line."



[Dyadic Announces Technology Transfer and Licensing Agreement With South Africa's Rubic Consortium](#)

"The need to quickly acquire and commercialize technology and manufacturing capabilities, which addresses the infrastructure necessary to deploy vaccinations for broad populations affordably and timeously has never been a more strategic imperative of African nations than today," said Shabir Madhi, professor of vaccinology, Dean Faculty of Health Sciences at the University of the Witwatersrand, Johannesburg, who is leading COVID-19 vaccine trials in South Africa.



[Dyadic and Medytox To Develop Vaccines Against COVID-19 Variants \(South Korea & SE Asian Countries\)](#)

Dr. Gi-Hyeok Yang, Sr, Executive Vice President and Head of Research and Development at Medytox stated, "We have been working closely with Dyadic since July 2020, when we obtained access to their C1 expression platform and experienced the remarkable versatility and high productivity of the C1 platform. We believe that the fungi-derived C1 expression system is the most realistic technology to develop and manufacture multi-valent (i.e., tri-valent, and tetra-valent) vaccines, rapidly and affordably, against COVID-19 mutant viruses without the need for a large-scale bioreactor facility."

Signed licensing agreements creates production, commercialization, and distribution pathway for mass-scale immunizations across the globe quickly and efficiently.



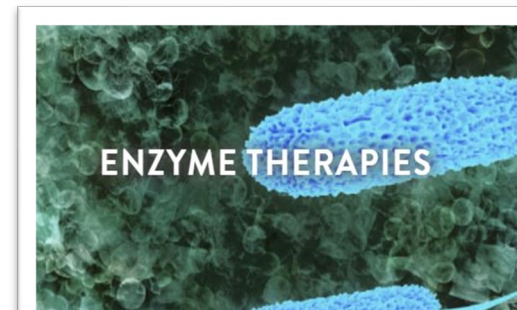
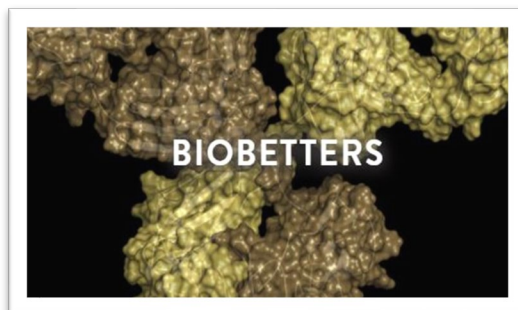
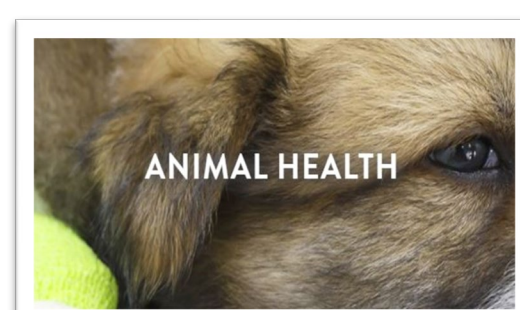
Development Pipeline

Extensive external partnerships are advancing C1 platform for diverse applications

	PROGRAM	STATUS
COVID VACCINE & ANTIBODY		
Sorrento Therapeutics - DYAI-100	SARS-CoV-2-S-RBD antigen and Other Coronavirus applications	DYAI-100 Preclinical animal trial Advancing Towards Clinical Trials
Syngene	COVID-19 variant vaccines	Co-development Program
Medytox	COVID-19 variant vaccines and/or boosters (e.g. multivalent)	Preclinical animal trial
Rubic South Africa	COVID-19 vaccine candidates	Co-development Program
ID Biologics (antibody)	COVID-19 mAb vaccine candidate	POC
Epygen ¹	Preclinical & Clinical trials using DYAI-100	Co-development Program
HUMAN (NON-COVID)		
Jiangsu Hengrui	Biologic drugs	POC
Turtle Tree (Growth factor)	Recombinant protein growth factors	POC
Top Pharma	Bispecific antibodies	Co-Development Program
U of Oslo	Influenza vaccine	Internal Program
Other collaborations	Multiple programs for antigens, including bispecific antibodies	10+ POC
ANIMAL PROGRAMS		
ZAPI	SBV and RVFV vaccines	Animal trial
Global Animal Health Co's.	Programs include vaccine for respiratory disease of birds	POC

C1-cells Have Broad Advantages Across in Biomanufacturing

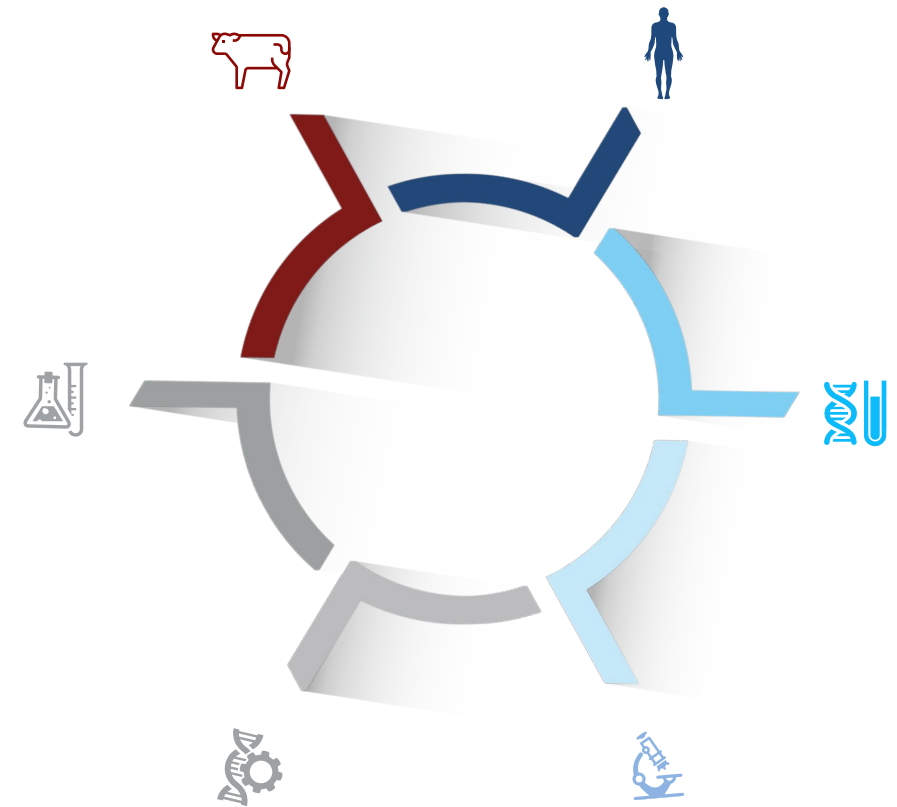
Unique Morphology: Low Cost, High Purity and Yield and Scalable Benefits for Protein Manufacture Across Broad & Growing Applications



Broad, Addressable Opportunity to Disrupt Pharma Manufacturing

Human and animal biopharmaceutical manufacturing landscape in need of innovations that improves efficiencies

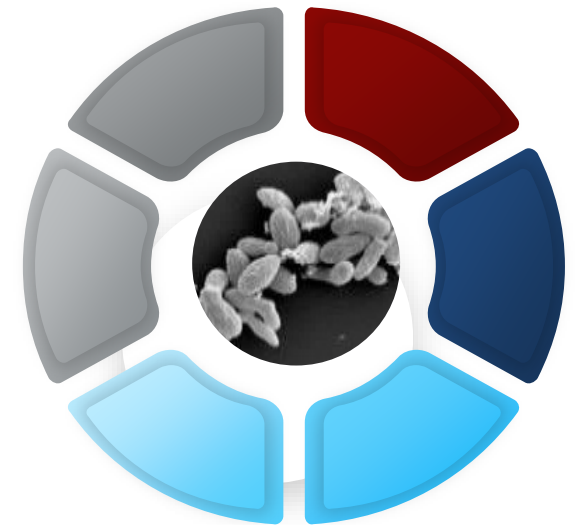
Market	Global Size
Recombinant Subunit Vaccines and Therapeutic Proteins for Animal health	\$11.3 Billion by 2025 ¹
New Biologics MAbs, Bispecifics, Fc-Fusions	\$319 Billion by 2021 ²
Recombinant Glycoprotein & Other Antigen Vaccines for Human Health	\$58.4 Billion by 2024 ³
Biosimilars/Biobetters/Other Biologics	\$69 Billion by 2025 ⁴
Vaccines and Therapeutics for environmental (pandemics) and other biological threats, including COVID-19	\$150 Billion by 2022 ⁵
Other - Growth Factors, Diagnostics, Metabolites, Reagents, Biocatalysts.....	



C1-Thermophilic Filamentous Fungi Key to Platform Technology

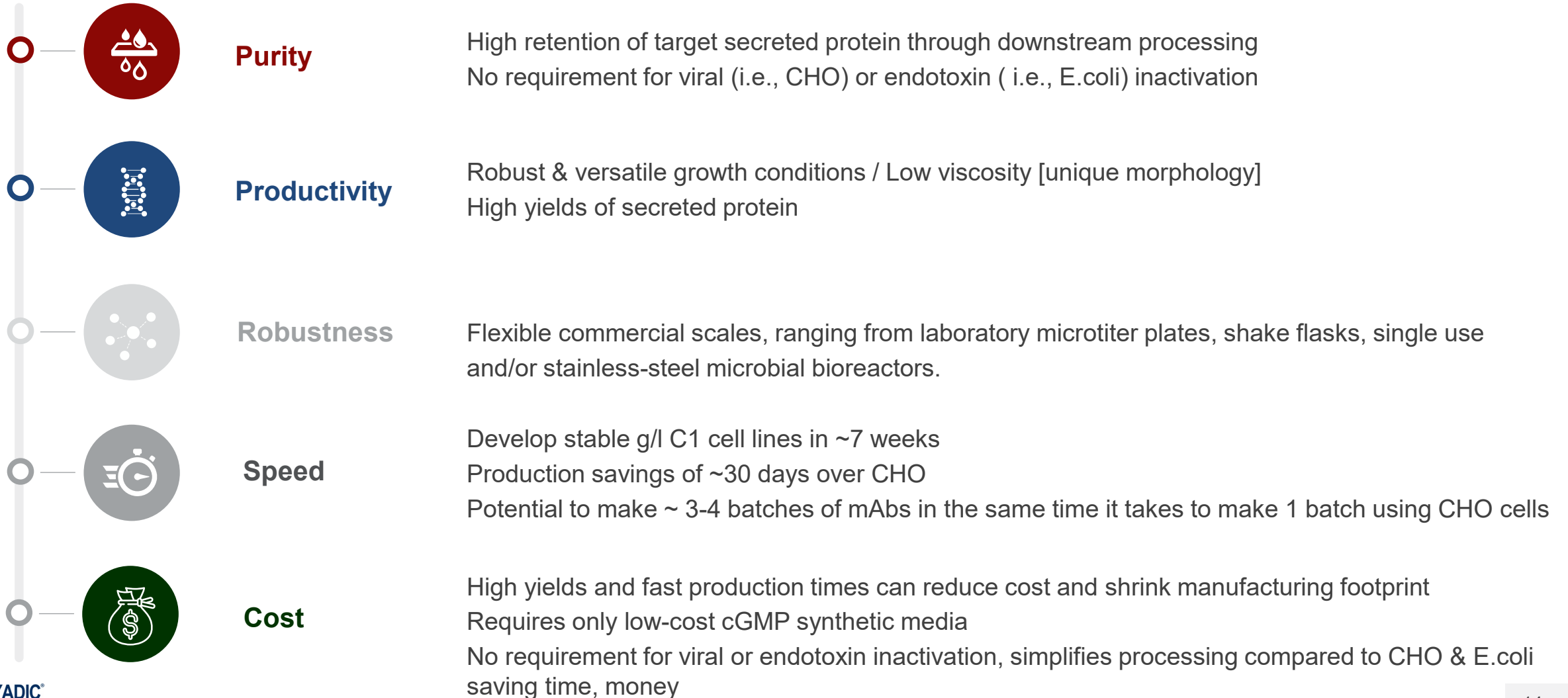
The C1 Platform provides safe, highly engineered, thermophilic filamentous fungi ideally engineered to grow under a broad range of conditions.

- **20+-year track record** – The C1 platform is commercially proven, and has been used to produce large quantities of low-cost enzymes for textiles, biofuels, pulp and paper, food cellulases, etc. at very large industrial scales, up to 500,000 liters
- **Poised to transform healthcare** – C1-cells have been carefully re-engineered to enhance scale, purity and yield in therapeutic protein production
- **Genetics toolkit defined** - C1-cell chromosomal genome have been sequenced, full sets of genetic tools for gene engineering and commercial use
- **Ready to deploy** - Multiple genetically engineered C1-cell lines with stable, differentiating properties, ready to deploy across small bespoke discovery, development and commercial cGMP grade production projects
- **Generally Recognized As Safe (GRAS) certification** - from US FDA in 2009
- **Toxicology Study Q4 2021**
- **Advancing Towards First In Human Clinical Trial**
- **No commercial retooling needed** – C1 is grown in regulatory friendly, low-cost completely defined synthetic media using standard microbial bioreactors



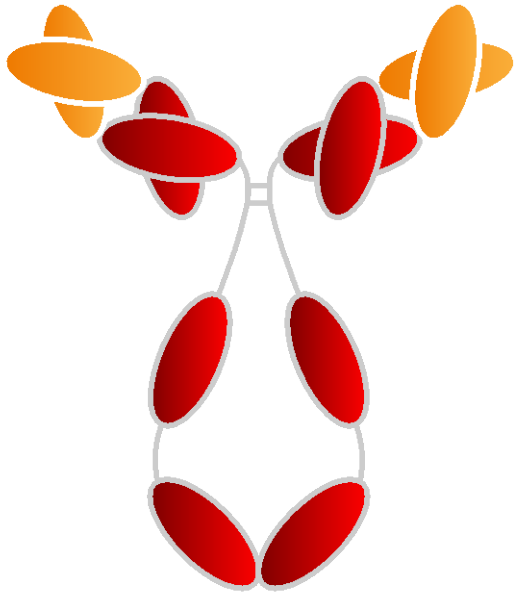
C1 Protein Production Platform Competitive Advantages

Robust Gene Expression Platform Offers A Number Of Competitive Advantages Over Existing Technologies



C1 Platform – Potential to Disrupt Conventional mAb Manufacturing

C1 platform produces comparable therapeutic proteins as CHO while overcoming key production limitations



C1 produces stable and correctly folded mAbs that have binding and neutralizing properties to those produced from CHO cells



**Lower
Cost**

Flexible production scale; C1 media <1/20 of the cost of CHO media
No viral inactivation required



**Faster
Production**

C1 produces product significantly faster (12-14 days) than CHO cells (41-54 days)



**Higher
Yields**

C1 produces more product per batch and larger overall quantities
~ Potential to produce three to four batches using C1 in the same timeframe as one batch using CHO cells

C1-Cell Recombinant Protein Production: Biologics

C1-Cells Enable Commercial Manufacture Of Rapid, Cost-Effective, High Value, Safe, Effective Protein Products

High Yields and Purities Demonstrated for Therapeutic Monoclonal Antibodies (mAbs) and Vaccine Antigen GlycoProteins¹

Fc-Fusion Products	mAb Products	Fab (Certolizumab) Product	Tri-specific Products
15.3 g/l ¹	24.5 g/l ¹	14.5 g/l ¹	6.12 g/l ¹
168 Hours	168 Hours	164 Hours	144 Hours
2.58 g/l/day	3.1 g/l/day	2.1 g/l/day	1.02 g/l/day

High Productivity for Recombinant Protein Antigen Classes Routinely Used in Vaccines

Influenza HemAgglutinin (HA) Products	Coronavirus Antigen (S-RBD) Products	Virus-Like Particle (VLP) Products
413 mg/l ¹	2,000/3,000 mg/l ¹	2,200 mg/l ¹
137 Hours	120 Hours	110 Hours
72 mg/l/day	400/600 mg/l/day	500 mg/l/day

1. Data from non-glycoengineered C1-cells using different protease deficient C1-cells

Regional Collaborations Have Helped Fund Advances in C1

ZAPI has helped validate the C1 Production Platform which can be used to churn out vaccines and antibodies in unprecedented amounts

- The European Union Zoonosis Anticipation Preparedness (ZAPI) Project, initiated in March 2015 has since worked to develop launch ready methodologies and platform technologies that could be put into production for vaccines and neutralizing monoclonal antibodies in order to efficiently counter emerging or reemerging zoonotic viruses of pandemic proportions.



Israel Institute for Biological Research (IIBR) Strategic Collaboration Has Helped To Position Dyadic to Enter Human Clinical Trials

- COVID-19 Strategic collaboration with the Israel Institute for Biological Research (IIBR) IIBR has positioned C1 positioned to be able play to important role in combating pandemics.
- Demonstrating that C1-cell produced SARS-CoV-2 receptor binding domain (RBD) can be manufactured in large quantities, at low cost, while neutralizing the COVID-19 Virus.

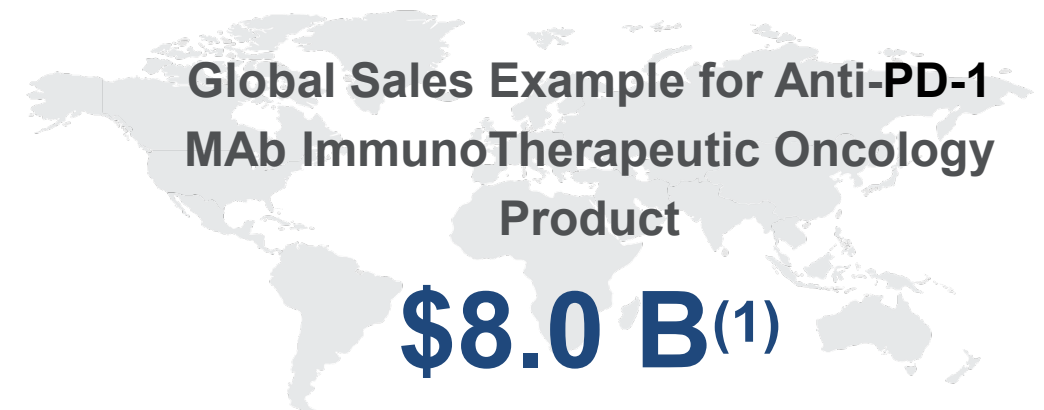
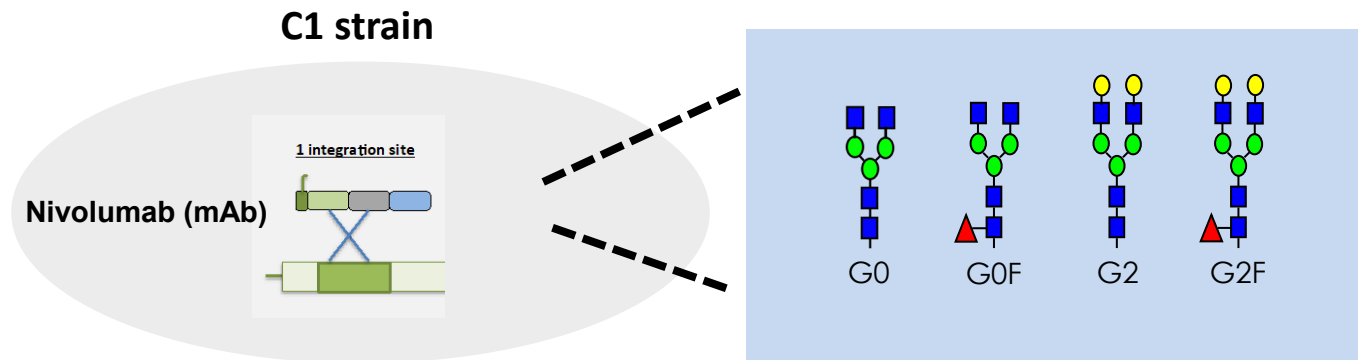


Human Biopharmaceutical Programs - Nivolumab (Opdivo®) a Biosimilar mAb Candidate

Anti-Cancer mAb, (i.e., Anti-PD-1 IgG) Are Compelling High Value mAb Product Opportunities For Fungal C1-Cell Manufacturing

Nivolumab (Opdivo®) manufactured by Bristol Myers Squibb, is an immunotherapeutic biologic Mab drug for human metastatic cancers, including melanoma , lung & other cancers

- Opdivo priced at \$12,500 per month or about \$150,000 per year of treatment
- Goal of program is to express Nivolumab (MAb) with a glycoprotein structure similar to Nivolumab produced in CHO cells
- Dyadic has glycoengineered mAb producing C1-cell lines with G0 levels of about 95% and G2 of about 76% as part of its glycoengineering program for glycoprotein Immunoglobulin G (IgG) monoclonal antibodies
- Further C1-cell engineering & manufacturing mAb process development ongoing
- **Important Proof Of Concept in successfully manufacturing Optivo mAb biosimilar or biobetter product, C1-cell manufacturing tech applicable to several very high value therapeutic or preventative monoclonal antibodies**



Business Development Strategy

External development programs help advance C1 recombinant protein platform and fund R&D initiatives

Co-Development /Technology Licensing

Allows Dyadic to develop and advance C1 recombinant protein tech at low cost to Company

Big Pharmas

Funded proof of concept collaborations for specific therapeutic products

Potential for UP-front access fees, milestones and royalty payments

Small & Medium Biotech's

Potential for equity, milestones and royalty payments

Grants & Contracts

Governmental and agency grants and contracts

Internal Dyadic Product Development

Dyadic funds high value product candidate programs where C1 recombinant gene expression overcomes barriers of existing platforms with meaningful technological or commercial impacts

- COVID-19 vaccine candidate, DYAI-100
- Glycoengineering
 - Advance Nivolumab (Opdivo®) Biosimilar MAb
 - As Proof of Concept for Production of mAbs
- Protease deletion and engineering
- SARS-CoV-2 Variants. Influenza other Infectious Diseases
- Metabolites

Rising Interest in Pharma for Acquisition of Platform Technologies¹

Recent acquisitions of cell-based gene expression and recombinant protein platforms



2006

Merck & Co., Inc. To Acquire GlycoFi, Inc. For \$400 Million ² ***Yeast cell***



2011

Johnson & Johnson Acquires Vaccine Developer Crucell - \$2.4 billion dollars, moving J&J prominently into the arena of vaccine development ³ ***Human cell***



2017

Sanofi completes acquisition of Protein Science for \$750 Million ⁴
Baculovirus expression system



2020

Ligand Buys Pfenex in \$516 Million Deal to Access Protein Production Platform ⁵ ***Bacterial cell***

1 . <https://www.forbes.com/sites/mergermarket/2018/10/26/pharma-ma-slumps-as-buyers-look-for-platforms-instead-of-single-products/?sh=6fed8c266848/>

2. <https://www.biospace.com/article/releases/merck-and-co-inc-to-acquire-glycofi-inc-for-400-million/>

3. <https://www.biopharminternational.com/view/johnson-johnson-acquires-vaccine-developer-crucell/>

4. <https://www.pharmaceutical-technology.com/news/newssanofi-completes-acquisition-of-protein-sciences-for-750m-5910136/>

5. <https://www.biospace.com/article/ligand-buys-pfenex-for-516-million/>

2021 Strategic Objectives

SARS-CoV-2

Advancing Towards Phase 1 Clinical Trial using a Dyadic owned C1-cell manufactured SARS-CoV-2 Receptor Binding Domain (RBD) recombinant antigen vaccine product candidate in collaboration with CR2O

Demonstrate Safety & Preliminary Efficacy (POC) In Humans

Expanding portfolio of vaccine candidates against SARS-CoV-2 variants through partnerships with Medytox & Syngene

Anticipate a Phase 1 Human Clinical Trial in the EU with a C1-cell manufactured SARS-CoV-2 monoclonal antibody

Animal Health Programs

Continue to advance commercial recombinant antigen vaccine product candidates in animal trials with global animal health companies, **including for an acute respiratory disease of birds**

Advancing C1 produced SBV & RVFV recombinant antigen vaccines in additional safety & efficacy studies with additional funding from ZAPI

Human Biopharmaceutical Programs

Advancing several recombinant protein growth factors as potential regenerative therapies with TurtleTree Scientific

Advancing mAb with top tier biopharmaceutical company with registrational potential in oncology

Advancing bispecific mAb with top tier biopharmaceutical company with registrational potential in autoimmune disease

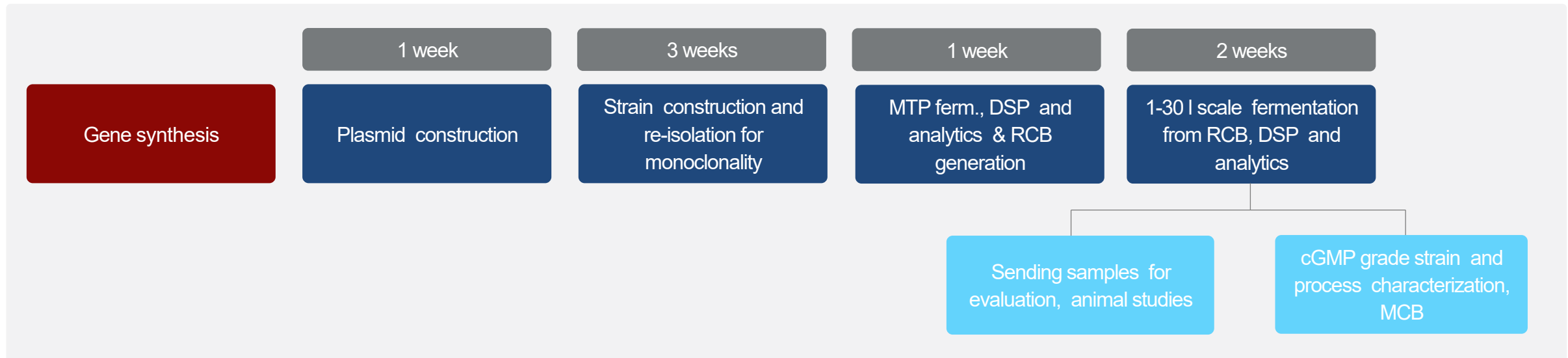
Part of the glycoengineering effort we are using Nivolumab (Opdivo®) as a potential biosimilar MAb product candidate

Infectious Disease Strategy For Animal and Human Health

Potential to Develop Multi-Valent Recombinant Variant Antigens (i.e., SARS-CoV-2 and Influenza) Vaccine Candidates

Already Five (5) Variant of Concern SARS-CoV-2 RBDs have been expressed from C1-cells, including the **Delta Variant**

Univ. Oslo HA mice trial supports previous Sanofi HA mice trial for potential use of C1 for producing influenza vaccines



Monoclonal antibodies (mAbs) have been expressed from C1-cells for potential use in treating infectious diseases, including SARS-CoV-2, Zika and Rift Valley Fever.

Key Takeaways

Next Generation Protein Expression Biotech with Well-established Global Partners

Proprietary C1 gene expression technology

Designed to bring biologic vaccines and drugs to market faster, in greater volumes, at lower cost

Competitive advantages

Compared with other pharmaceutical expression systems supported by robust and growing scientific data on protein expression yield, stability and purity

Validating partnerships

Well-established, global biological R&D organizations, top-tier animal and human health pharmaceutical companies, as well as governmental agencies

Opportunistic business development

Emphasis on large and growing addressable human and animal health markets; many shots on goal

Strong financial position

\$25.8 million in cash and investment securities, no debt and complemented by partner funded on-going R&D collaborations ⁽¹⁾

Experienced management - board of directors

Driving process and execution excellence

Thank-you

Contact: ir@dyadic.com
www.dyadic.com