

## **Mymetics Corporation**

Overview

May 2021

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# Mymetics' vision is to become leading developer of the new generation virosome based vaccines for infectious and life disabling diseases

#### Why Vaccines?



Prevention better than Treatment: Lower Cost of Healthcare

Currently only 26 Infectious Diseases are Prevented by Vaccines: Many More to Address

Significant Unmet Needs Remain: 25% of worldwide annual deaths due to infectious disease (15M)<sup>1</sup>

Major targets remain: RSV, CMV, HIV, HSV....SARS-CoV-2

Additionally - New Opportunities in Immunotherapy: Oncology and Allergies

Novel Vaccine Approaches Required

Vaccine Market to grow from \$37 Billion in 2019 to \$57 Billion in 2025 (CAGR 7.4%)<sup>2</sup>

Priority Target for Big Pharma: GSK, Merck, Sanofi, Pfizer, Seqirus-CSL (80%-85% of vaccine market)

Growth Driven Mainly by Innovation: Blockbuster premium priced vaccines: Prevnar I 3<sup>®</sup>; Gardasil<sup>®</sup>;

Rotateq<sup>®</sup> & Rotarix<sup>®</sup>; Shingrix<sup>®</sup>;

#### Mymetics Summary



Mymetics Corporation: OTCQB MYMX – Venture Stage Market Place and current in SEC reporting

Location / resources: HQ in Biopole Lausanne (CH) and R&D in Leiden (NL)

Core Competence: World leading experts and IP in R&D and CMC for Virosome Technology Platform

Integration and presentation of membrane proteins and antigens for innovative vaccine

candidates against life disabling and infectious diseases.

Third Party Validation: License, Collaboration and Funding Agreements with Pharma and Leading Foundations

Pipeline: Clinical stage data: Intra-nasal Influenza, HIV and Malaria

Pre-clinical data: SARS-CoV-2 (several collaborators)

Cancer Immunotherapy (several Partners)

Birch Pollen Allergy – two successful preclinical studies

Revenue Generating since Sep 2013: cumulative more than > €15 million (collaborations and grant funding)

#### Important Events



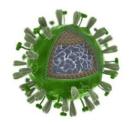
- 2014 16: Gates Foundation \$1.8 million funded HIV vaccine study in NHPs at Texas Biomedical Research Inst.
- 2015 18: EU Horizon 2020 grant: €8.4 million Achieved GMP thermostable / cold chain independent virosome vaccine in powder and capsule forms
- 2016 18: Research collaboration Project with Sanofi Pasteur (US) influenza virosomes
- 2016 18: Collaboration with NIH and LMIV for transmission blocking malaria vaccine
- 2018 20: EU funded development of multistage malaria virosome based vaccine
- 2018 20: Two projects with Anergis SA for Ultra Fast birch pollen Allergy Immunotherapy based on virosomes Met all success criteria, beating Clinical Trial Phase 2 candidate in preclinical POC
- 2019 to date: Started several collaboration projects with virosomes in the field of Cancer Immunotherapy Generating strong induction of specific (CD8+) T-cells (Confidential Data)
- May 2019: NIH grant of USD 8.7 million for 5 year project: (i) rectal challenge study in non-human primates at University of Louisiana Lafayette and (ii) to prepare thermostable HIV vaccine candidate for clinical trials. (Results available by H2 2021)
- Apr. 2020 to date: Start of virosome-based Covid-19 vaccine development with several collaborations
  Baylor College of Medicine (RBD rprotein); Amsterdam Medical Center (S-protein); University Hospital Bern
  Funding: European Community (Transvac2) and Innosuisse (Swiss Innovation Agency)

#### Virosomes



- Virosomes are virus-like particles consisting of virus envelopes
- Virosomes lack the genetic material of the native virus: virosomes are non-infectious
- Retain the receptor-binding and membrane fusion properties of the virus (membrane fusion elicits CD8+ Tcells)
- Lipid membrane allows optimal presentation and folding of antigens











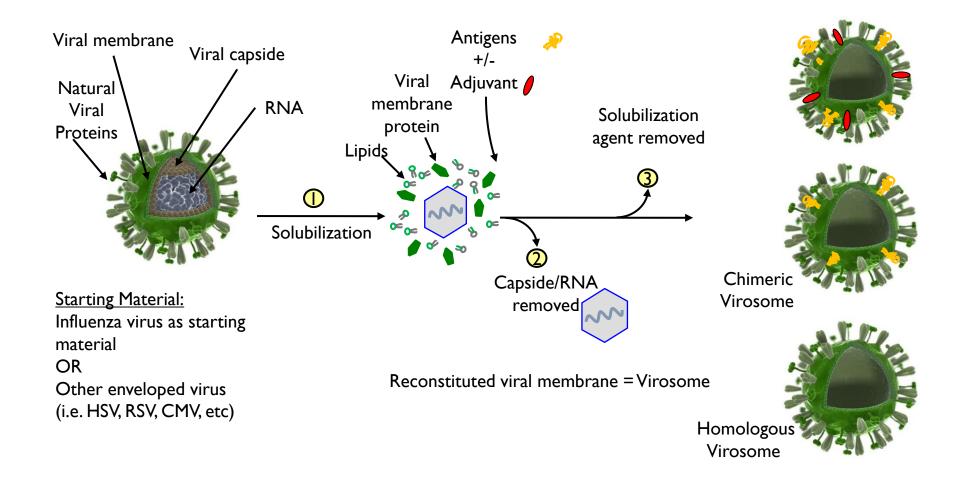
virosome vaccine



virosome as carrier platform for vaccines

## **Creating Virosomes**





#### Advantages Virosome Platform



SAFETY: No Genetic Material – Non-Infectious

Safety in different populations: children, immune compromised, elderly

Possible Administration: intra-muscular, intra-nasal, oral capsule or sublingual tablet

STABILITY: Stable liquid or lyophilized virosome formulations

Thermostable powder – cold chain independent virosome formulations possible

IMMUNOGENICITY: Close to Nature: Reconstituted Natural Viral Membrane,

Includes Natural Proteins of Virus

Can include Antigens and Adjuvants in Membrane (All on one Particle)

Optimal Presentation to Immune System (specific CD4+ and CD8+ T cell responses)

Strong Induction of Systemic (blood) & Mucosal Immunity

No interference of pre-existing influenza immunity – actually improves the response

BROADLY APPLICABLE: For any Enveloped Virus and as Antigen Carrier System and as Antigen delivery carrier

for Immunotherapy

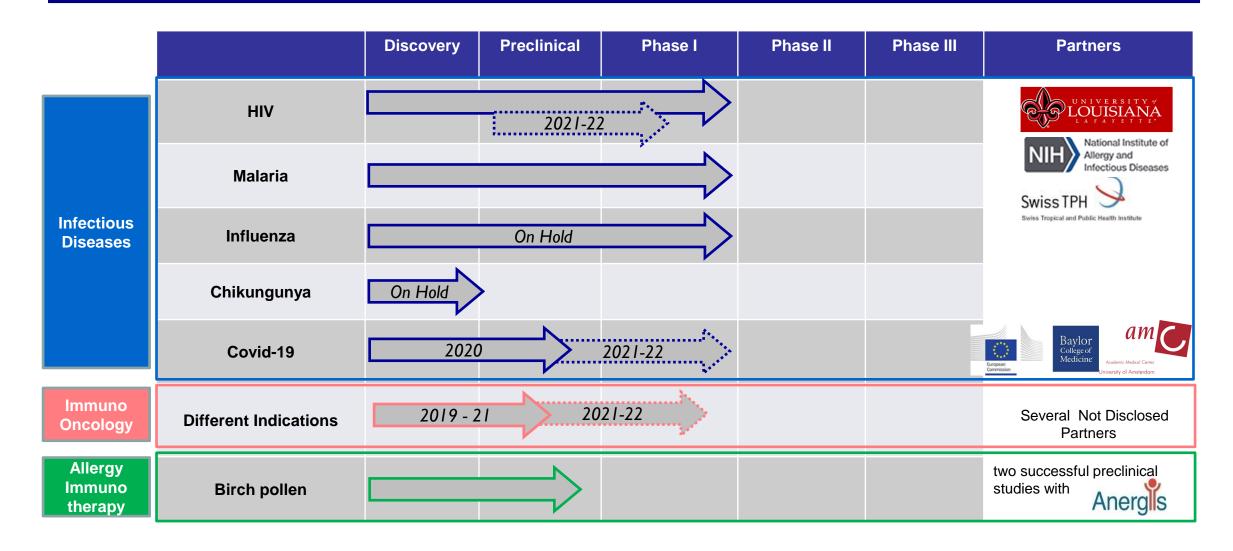
SCALABLE & COST: Large Scale and GMP enabled and low COGS

ALREADY PROVEN: Epaxal® (Hep A) & Inflexal® (flu) – JNJ;

Invivac® - Abbott (flu)

#### Mymetics Virosome Platform Pipeline Overview





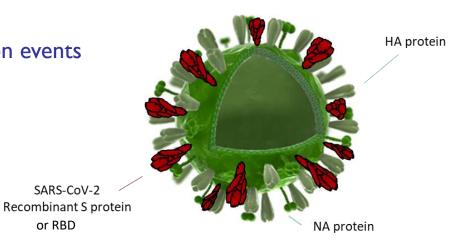
#### Mymetics SARS-CoV-2 Virosome-based Vaccine short term activities



#### Mymetics virosomes focusses on the following value points:

- broader efficacy & longer protection (including variants of concern)
- avoid severe disease
- intranasal administration stop transmission and stop early infection events
- modular and fungible production and low COGs
- ease of storage and handling
- Produce and Test the different SARS2 virosome vaccines in preclinical animal models:
  - intranasal admin.
  - dose sparing
  - adjuvant selection
  - neutralizing antibodies
  - protection against challenge
  - absence of antibody enhanced disease
- Preclinical Results during H2 2021
- Select most promising candidate to go forward into clinical trials in 2022

#### SARS2 Virosome Vaccine





SARS-CoV-2

or RBD







#### Some Pipeline Results: HIV virosome-based vaccine candidate



2007 - 2009

Preclinical NHP studies at ILAS – Beijing, China (Publication: Immunity, Feb. 2011)

- ✓ 2 times i.m. and 2 times i.n. vaccinations
- ✓ 100% protection with SHIV Clade B (NIAID) heterologous vaginal challenges
- ✓ 40% protection with SHIV Clade C (R.Ruprecht) heterologous vaginal challenges

• 2009 - 2012

Phase I study – Leroux-Roels, Belgium (n=24) (Publication: PlosOne, Feb.2013)

- ✓ Safe and very well tolerated (IM & IN)
- ✓ High seroconversion rate within one injection
- ✓ Mucosal IgGs & IgAs induced

for Clinical trials (5 year project).

- ✓ Mucosal samples block HIV transcytosis
- ✓ Human data confirming the macaque results

• 2014 - 2016

BILL&MELINDA
GATES foundation

TEXAS BIOMEDICAL
RESEARCH INSTITUTE

Gates Foundation \$1.8 million funded NHP HIV vaccine study with Texas Biomed. Research Inst

√ 78% to 87% protection against SHIV clade B (NIAID) during first 7 challenges 78.4% delay time-to-first viremia and 87% delay time-to-persistent systemic infection

NIH grant of \$ 8.67 million to prepare Mymetics HIV vaccine in liquid and powder forms

May 2019



✓ Started May 1, 2019. First results expected in H2 2021.



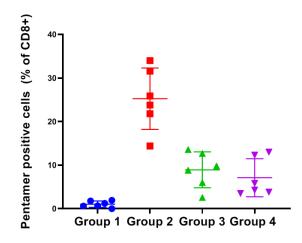
## Some Pipeline results: Virosomes for Cancer Immunotherapy



- > Oct. 2018 to date
- Started Collaboration Projects in Cancer Immunotherapy Field
- √ Virosomes allow MHC Class I presentation
- ✓ Ability to incorporate cancer antigens/peptides and adj. in virosomes
- ✓ Strong specific CD8+T cells in mice
- ✓ Started feasibility studies in CT26 and TC-1,
  - Inhibiting tumor growth (significant)
  - Increased survival (significant)

Partners
Not Disclosed

**Detailed Data is Confidential** 



- Virosome vaccinated groups: significant
   CD8<sup>+</sup> pentamer positive cells vs placebo.
- Ranging from 7% to 25% pentamer positive CD8<sup>+</sup> T cells.

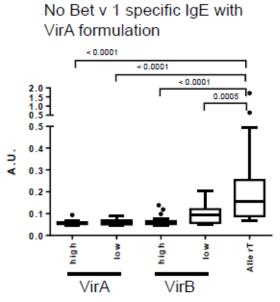
## Some Pipeline results: Virosomes for Allergy Immunotherapy

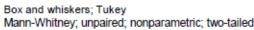


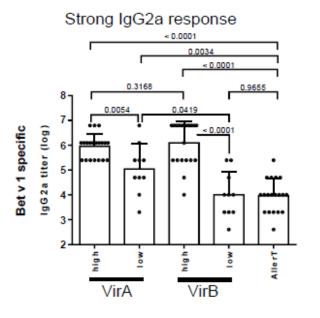
> 2019

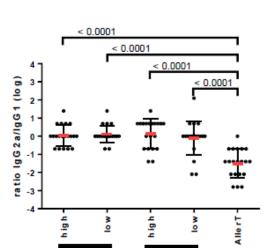
Preclinical Study Birch Pollen Immunotherapy - Collaboration Project with Anergis SA

✓ Met all success criteria - beating the AllerT - Anergis Phase 2 comparator. no IgE induction - strong immunogenicity - high Th1 response









VirB

Th1 shift

Mean ± standard deviation Dunn's multiple comparisons test

> 2020

Study by Stallergenes Greer SA and Anergis SA Virosomes coupled to Bet v 1 COPs triggered a boosted Th1 immunity and favorable safety profile. Virosomes were able to fully reverse asthma symptoms and lung inflammation in a sublingual therapeutic model of birch pollen allergy (1)

#### Some Pipeline Results: Malaria virosome-based vaccine candidate



• 2008 - 2010

Phase Ib study in children in Tanzania (n=30) (Publication: PlosOne, 6: e22273, 2011) Virosome vaccine with AMA-1 and CSP1 antigens, 2 times i.m. injection (Blood & Liver stage)



- ✓ Safe and very well tolerated
- ✓ High seroconversion rate within one injection
- ✓ Attack rate (single event KM curves)
  - Day 30 90: 28% vs 73% (comparator)
  - Day 120 365: 50% vs 80% (comparator)
- ✓ Attack rate (multiple events): 50% reduction (p=0.02)
- ✓ Similar to GSK RTS,S BUT without adjuvant
- Nov. 2014 Dec. 2018
- PATH-MVI funded study for transmission blocking malaria virosome vaccine (Pfs230)





High Ab titers and 95% to 100% transmission blocking of parasites

• Jun. 2018 - 2019 Improvement of malaria vaccine by adding two new antigens (RH5 and CyRPA) and adjuvant





- ✓ Successful incorporation of 4 antigens and adjuvant
- ✓ Animal studies (Abs and Growth Inhibition)

#### Financial Summary



- OTC QB: MYMX current in SEC reporting and filings but not leveraged public listing until now
- 303 million shares outstanding, public float approximately 25%
- Capital Raised last 8 years: \$25 million in equity; \$40 million in convertible debt through private funding
- 55% of Company held by executives / board members
- Since September 2013 revenue generating and low cash burn

#### Summary



- Unique vaccine technology, know-how and IP: virosome as antigen carrier
- World leading virosome and membrane protein expertise and know-how
- Attractive and diverse pipeline with excellent results to date
- Multiple collaboration agreements with Pharma and Biotech companies
- Obtained non-dilutive funding from Gates Foundation, PATH MVI, NIH and EU Horizon 2020 for HIV and malaria vaccine development
- Revenue generating since September 2013
- Strong Management Team and Scientific Advisors