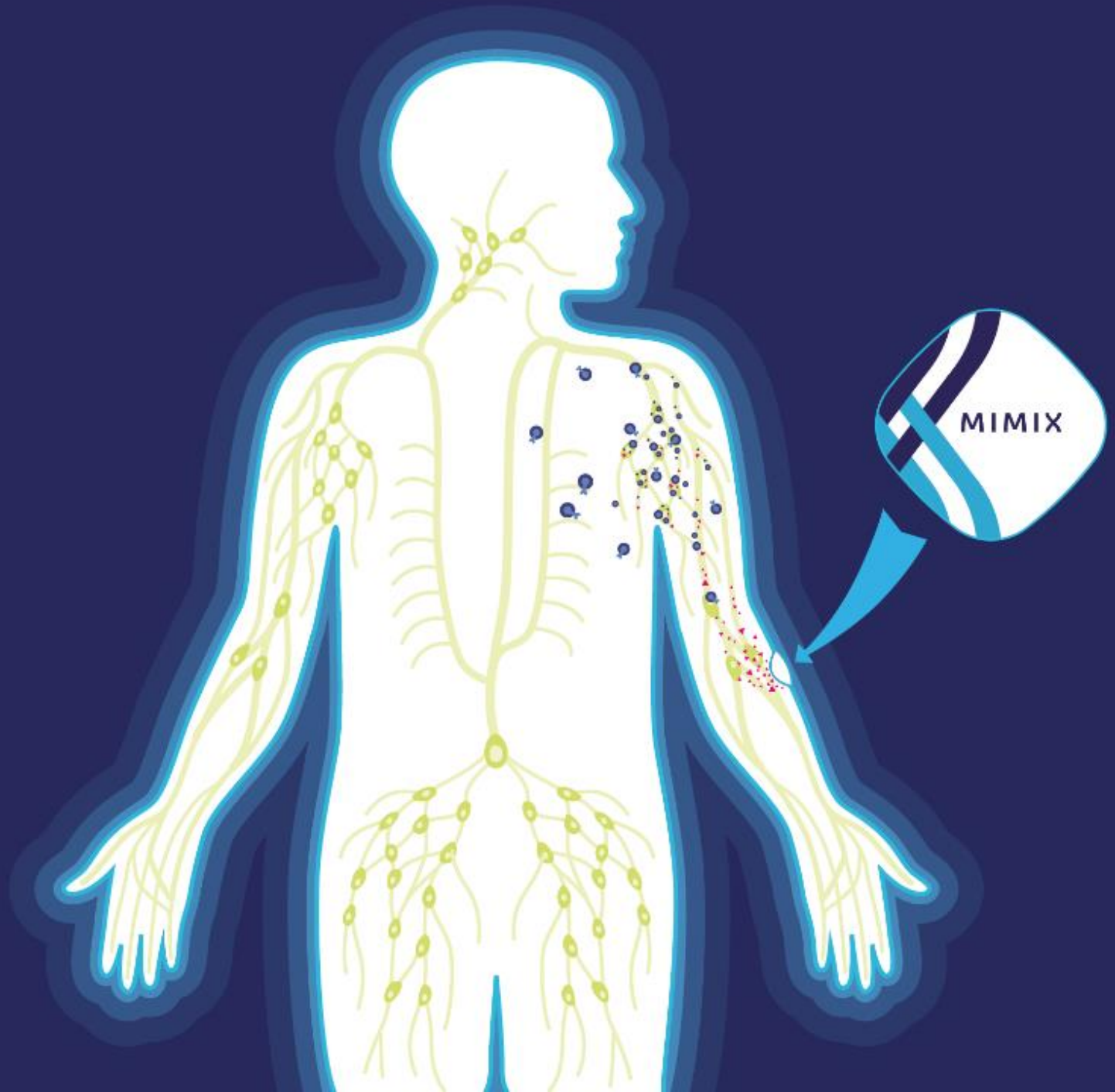
Introducing

MIMIX™

Radically Effective Therapies in Oncology and Infectious Disease



Developed by

VAXESS technologies

MIMIX™

Unlocking the Power of Our Immune System with MIMIX™

MIMIX smart-release therapies are engineered to release at the optimal rate in the skin or other epithelial tissue, the frontline of our body's immune system, to stimulate powerful antibody and T-cell responses.

Company Overview

17 Employees

2 Partners

10 Patent Families

$15M Non-dilutive funding

$8.2M VC Funding

THE ENGINE Built by MIT

bioinnovation CAPITAL

breakthrough immune activation

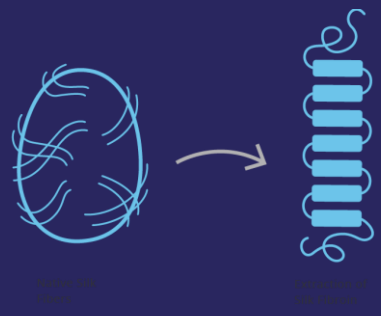
Not only what we deliver, but where and for how long.*

next-gen delivery

MIMIX enables sustained release of biologics into tumors or epithelial tissue

advanced materials

New silk-based material combines stabilization with tunable release to enable the first sustained delivery of biologics

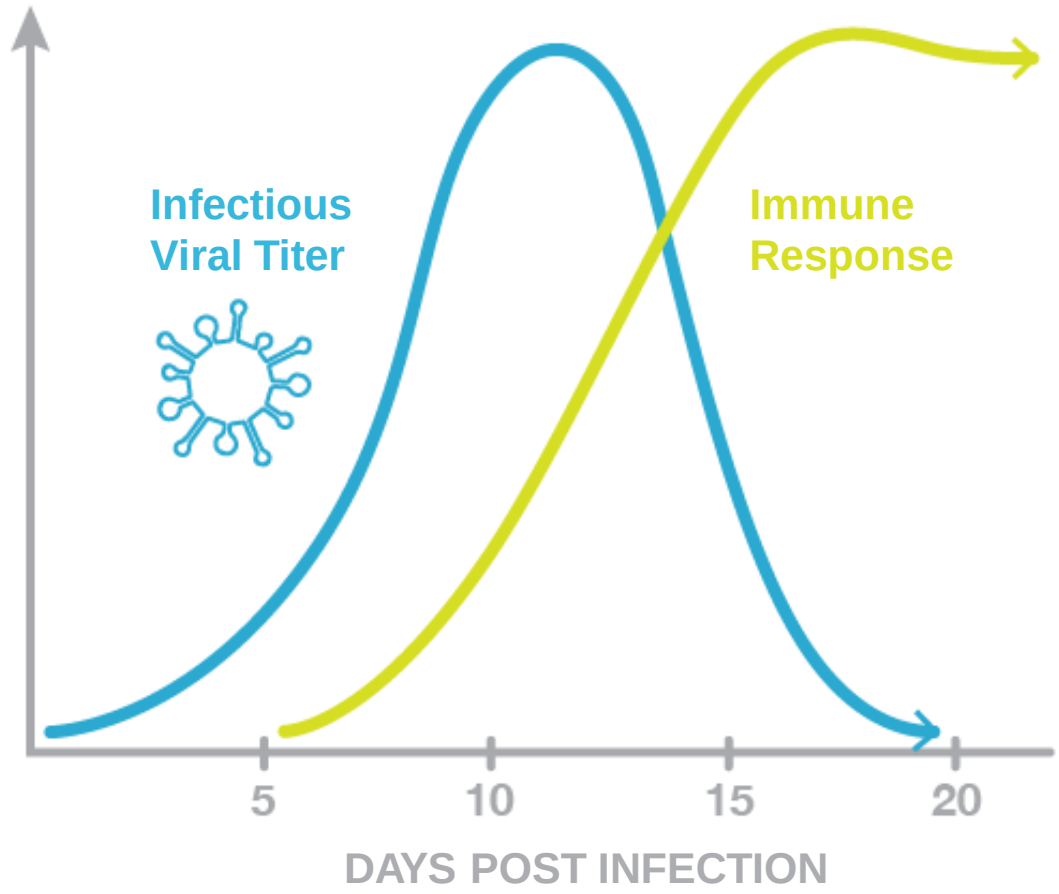


*Wittrup et al. ***(2019)*** What, Why, Where, and When: Bringing Timing to Immuno-Oncology. *Trends in Immunology*

THE INSPIRATION

Viruses enter epithelial tissue (ie. skin) and persist in the host over 2+ weeks.

The body generates a strong and durable immune response.

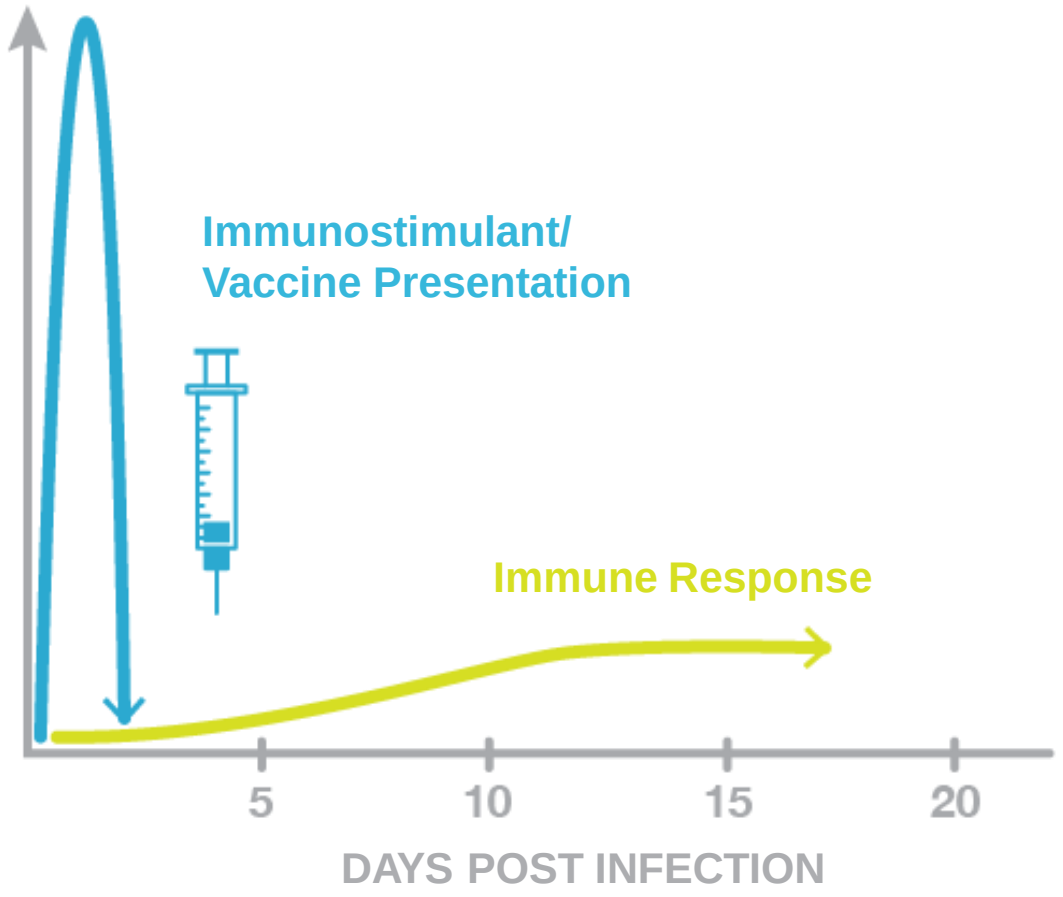


VAXESS technologies

THE DISCONNECT

Vaccines are administered into veins or muscles and cleared from the body in <2 days.

The body doesn't have time to mount a strong response.

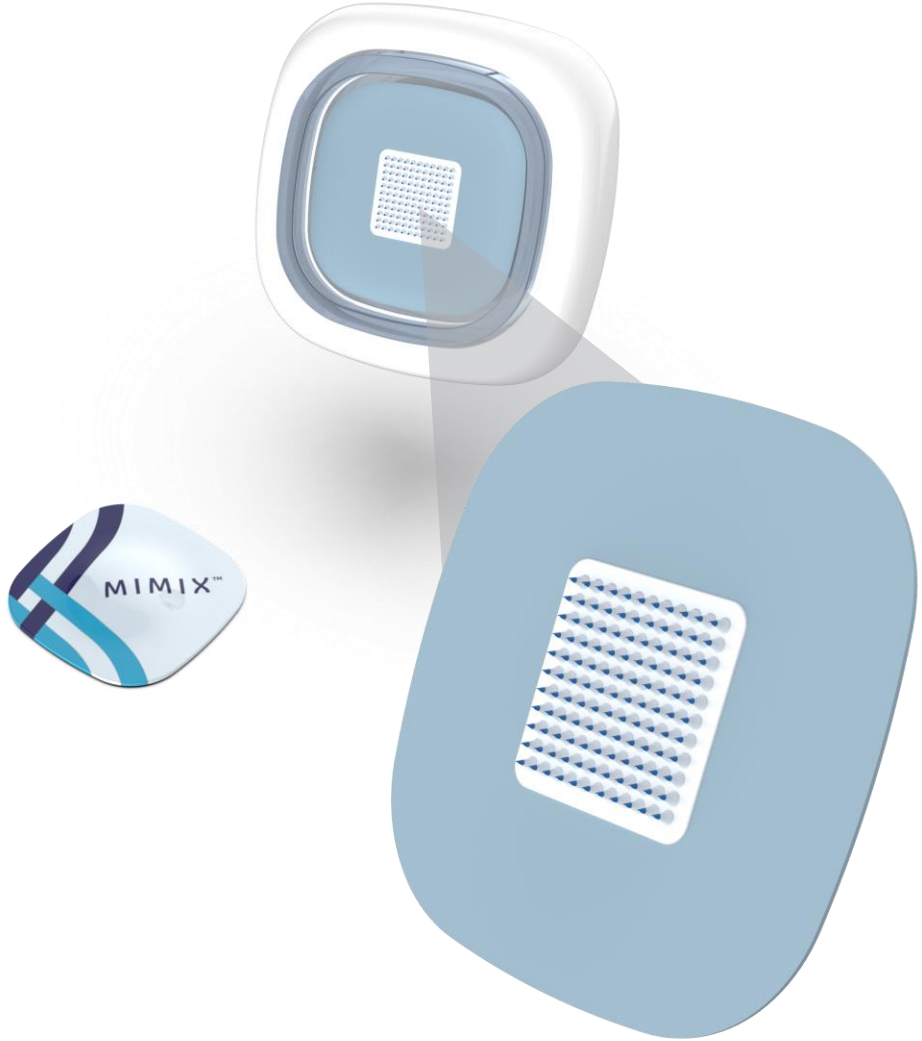


VAXESS technologies

It isn’t just WHAT we deliver, but WHERE and for HOW LONG to enable breakthrough immune responses.

We call it
Infection Mimicry.

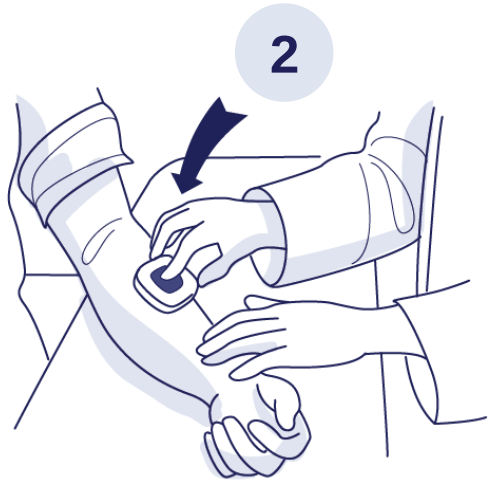
Introducing MIMIX smart-release therapies that mimic infections.

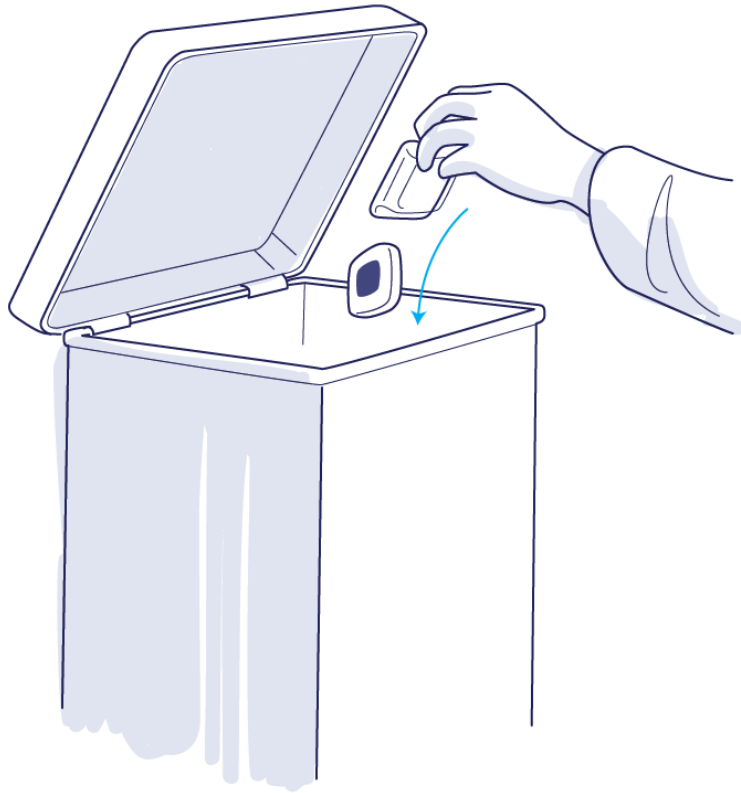


With just minutes of wear-time, MIMIX enables **weeks of sustained release** of treatments into tumors, skin, or other tissue.

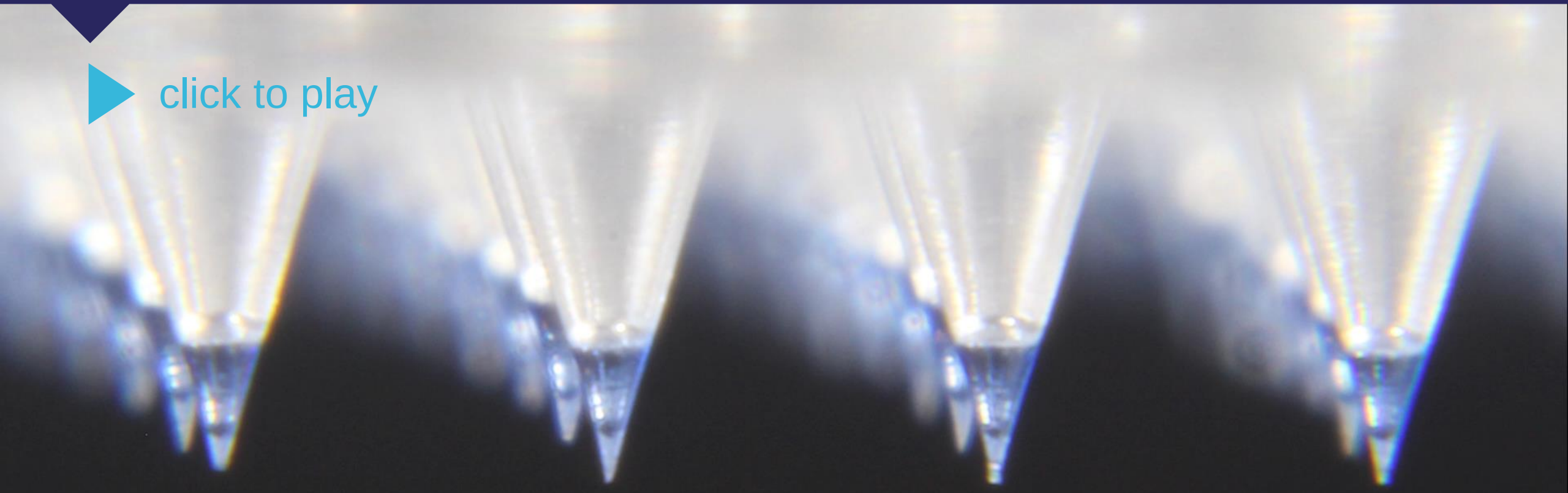
VAXESS technologies

How it works





click to play

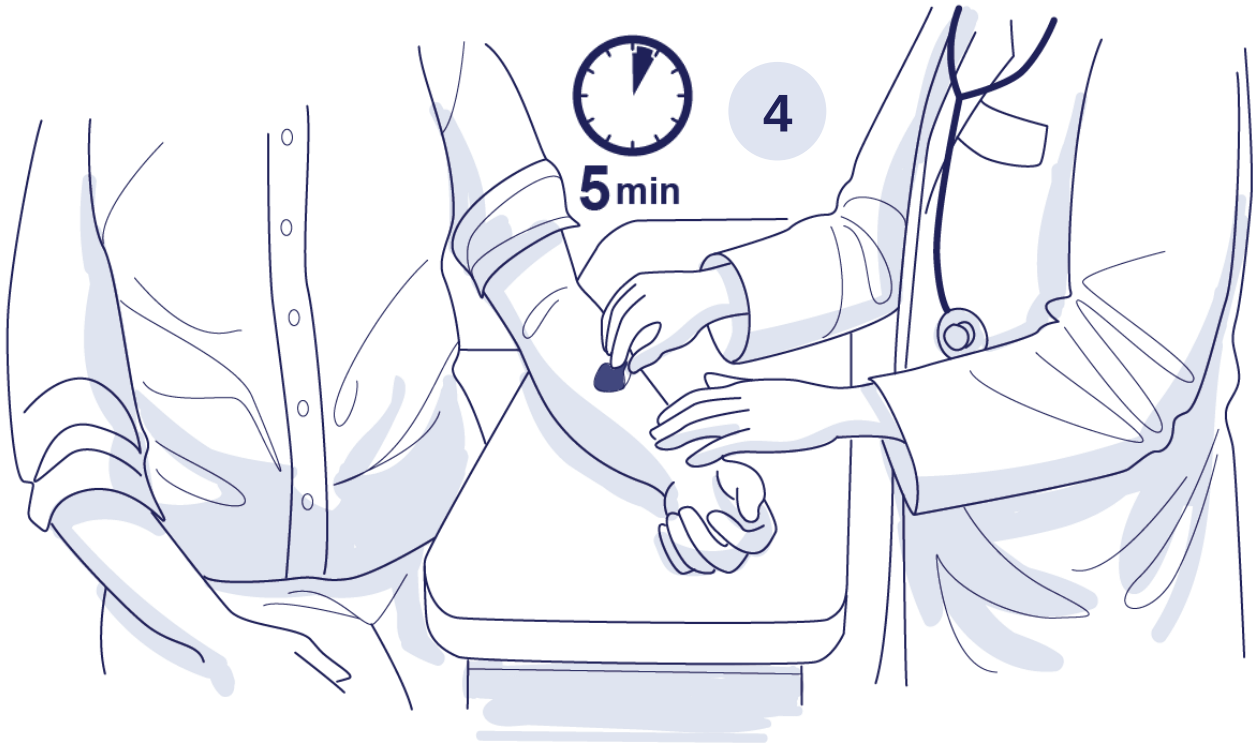


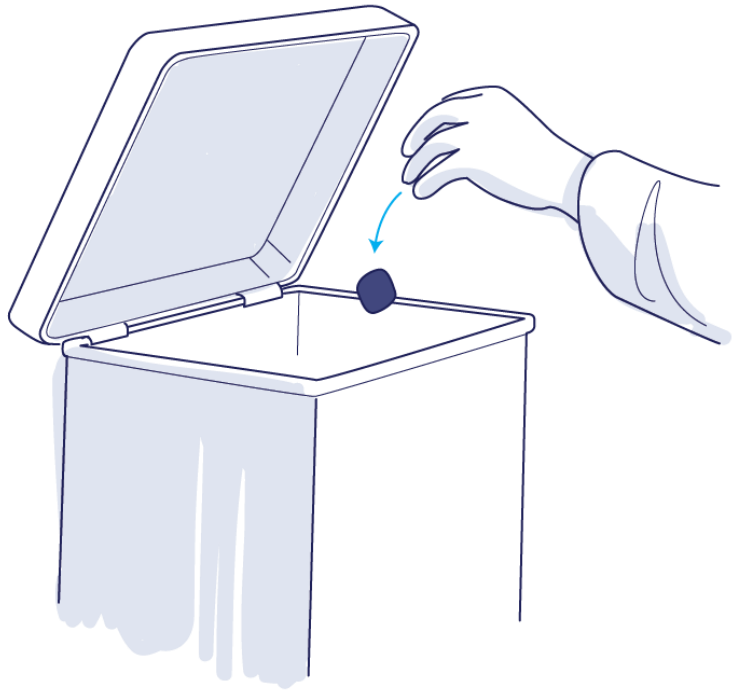
MIMIX™ smart release needles dissolve rapidly upon entering the skin, implanting the slow-release tip and enabling therapeutic release from minutes to months.

Click Here for YouTube Video

VAXESS technologies

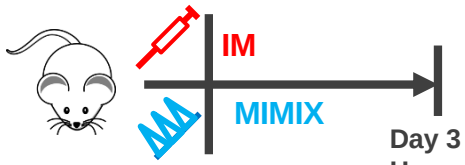
Dispose of used patches; no sharps.





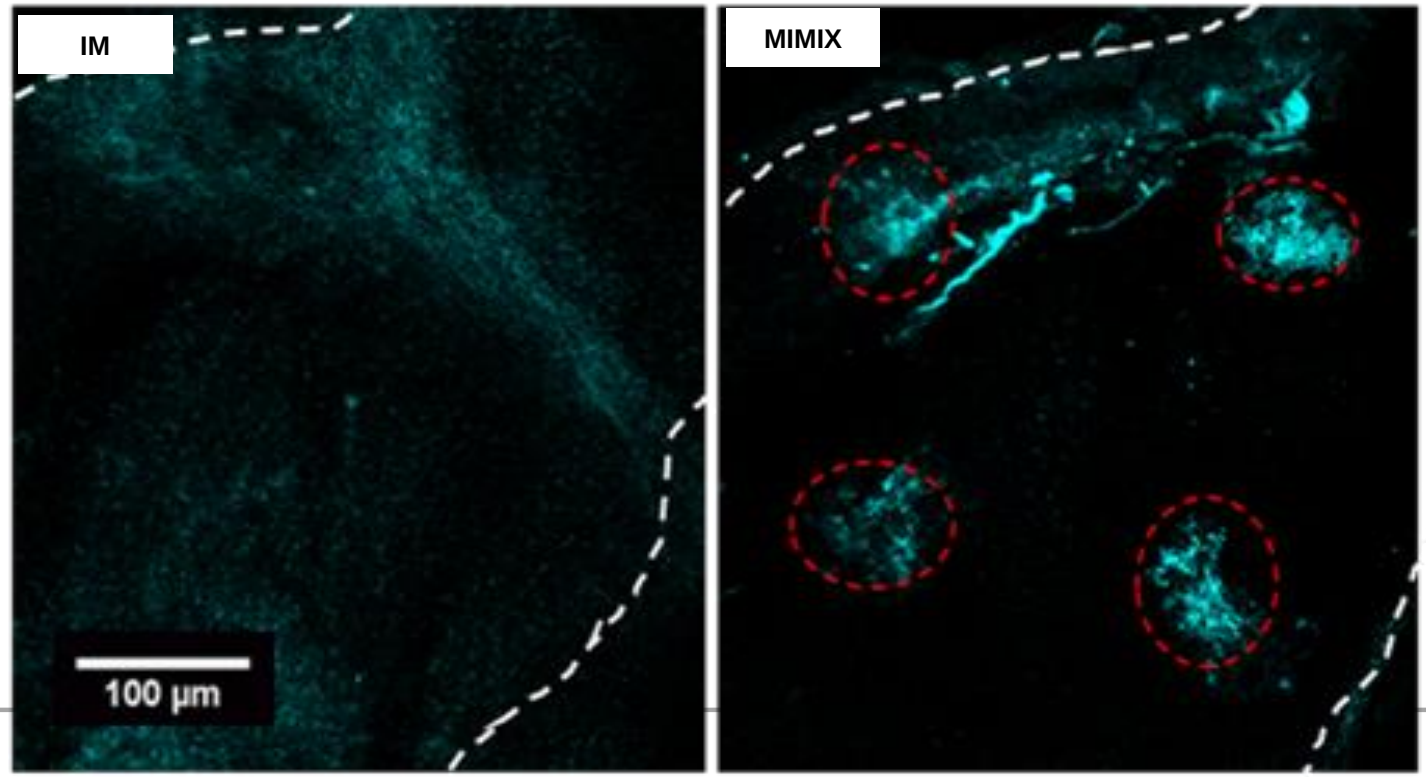
MIMIX enhances antigen retention in draining lymph nodes

Balb/c mice
Fluzone® HD-AF647



Day 3
Harvest
draining
lymph node

→ **3Disco tissue clearing** (Ertürk A et al., Nat Protoc 2012) **and whole organ confocal imaging**



Vaccine -- Cyan
White dotted line – Lymph node (LN) organ outline
Red dotted circles -- Pattern of follicular dendritic cells in LN

VAXESS technologies

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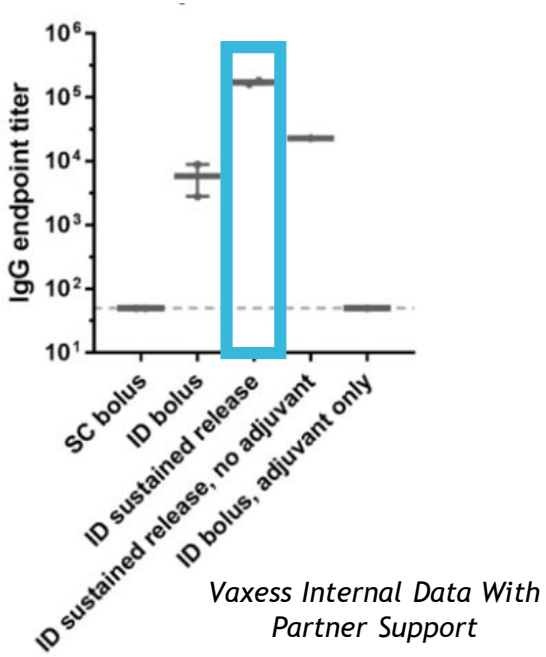
Infection mimicry via sustained release drives radical shifts in quantity and quality of response

1000x enhancement in antibody response

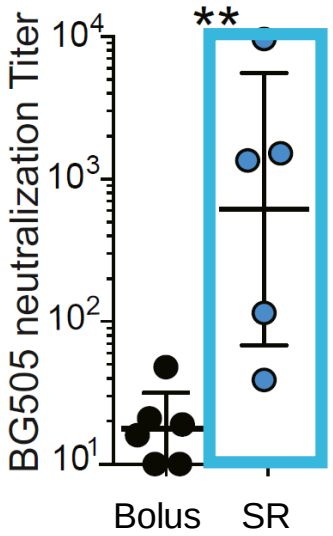
(HSV Therapeutic Vaccine)



Vaxess Internal Data With Partner Support

Shift to neutralizing antibodies

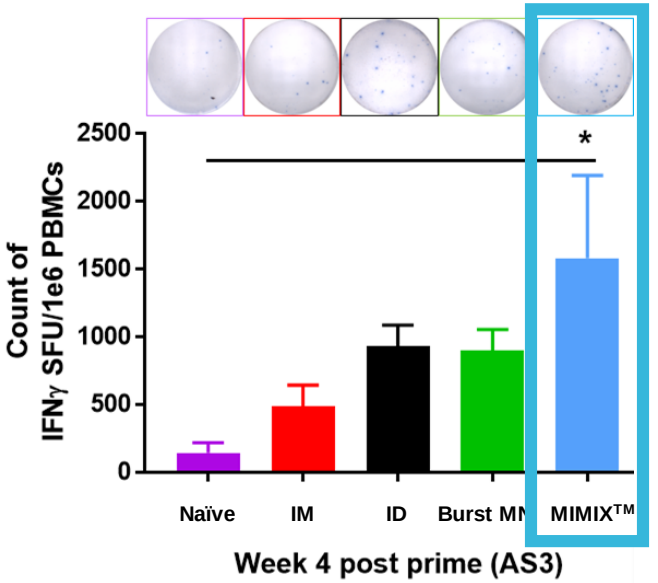
(HIV Vaccine (Primates))



Cirelli & Irvine et al., Cell **2019**

4x enhancement in T-cell responses

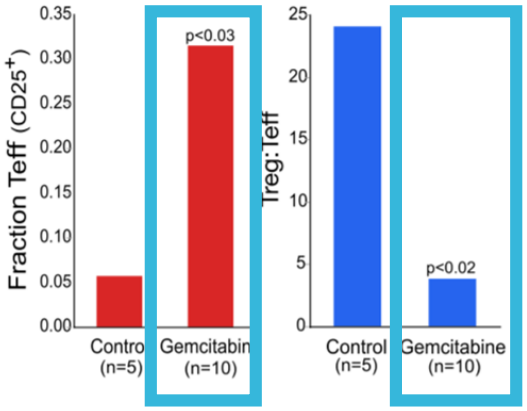
(Influenza Vaccine)



Vaxess Internal Data With NSF Support

Enhanced T-cell activation, reduced Treg in tumor environment

(Bladder Cancer)



Giesing et al., AACR Annual Meeting, 2018 (TARIS Biomedical)

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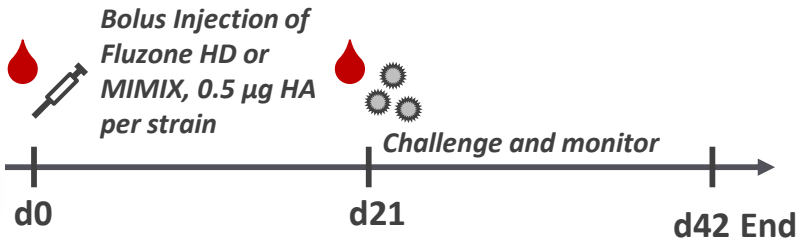
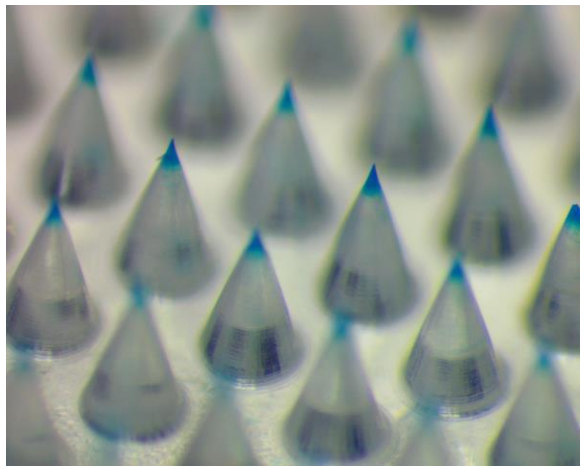
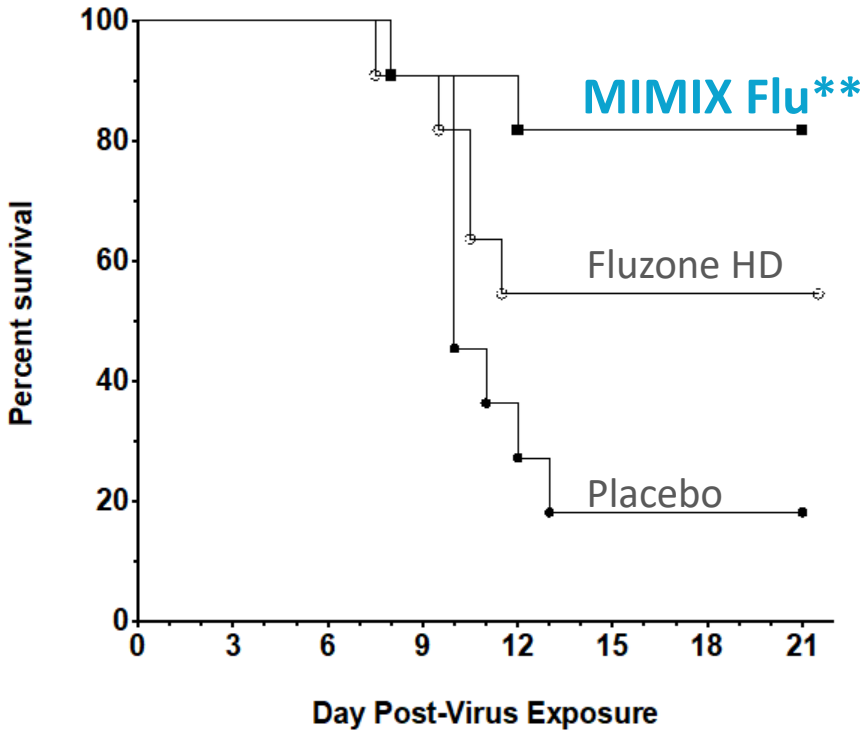
MIMIX-Flu Enhances Protective Efficacy Against Drifted Strains of Influenza

Immunization with 2018-19 seasonal influenza vaccine. Challenge with 2009 H1N1 strain (A/California/04/2009).







n=21 per group (11 for survival monitoring, 10 for analysis of virus titers and cellular immunity)

(**p < 0.01)

VAXESS technologies

Vaxess is using this approach to **train the immune system at one tumor to attack cancer** that has spread throughout the body.

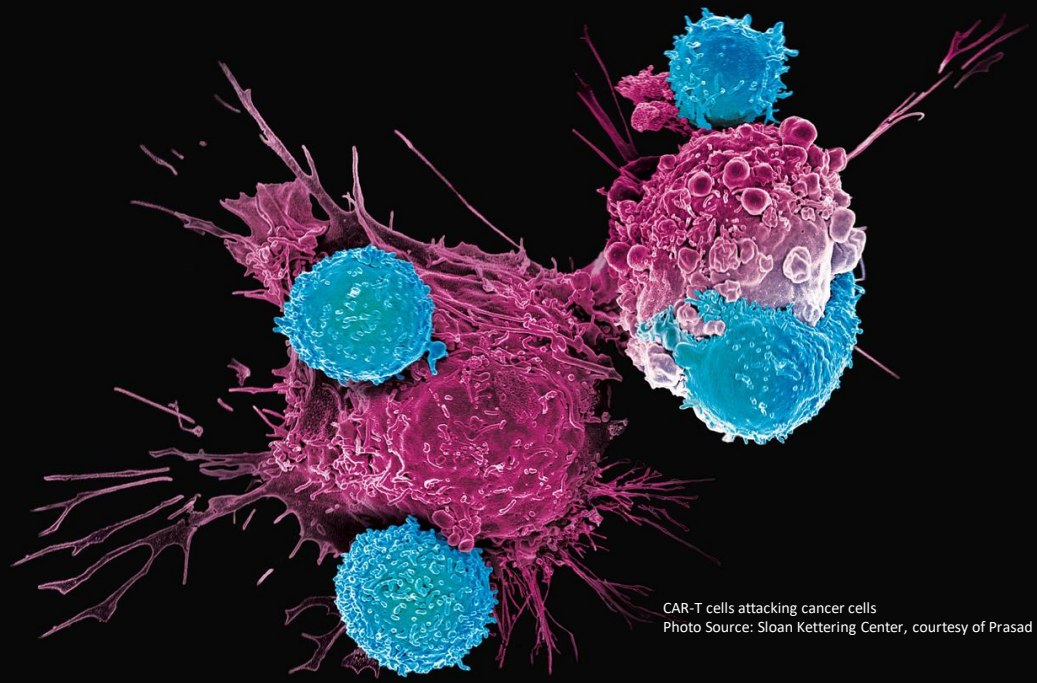
1. **The right antigen:** The patient's own lysed cancer cells serve as vaccine "antigen"

2. **In the right place:** T-cell maturation occurs in the lymph nodes, MIMIX drives strong lymph node trafficking

3. **For the right duration:** T-cell maturation takes time. MIMIX provides 2+ weeks of antigen exposure

4. **In the right combination:** Immune activation alongside cytokines and checkpoint inhibition

5. **With less toxicity:** Slow, intratumoral release reduces off-target effects for IL-2 and others

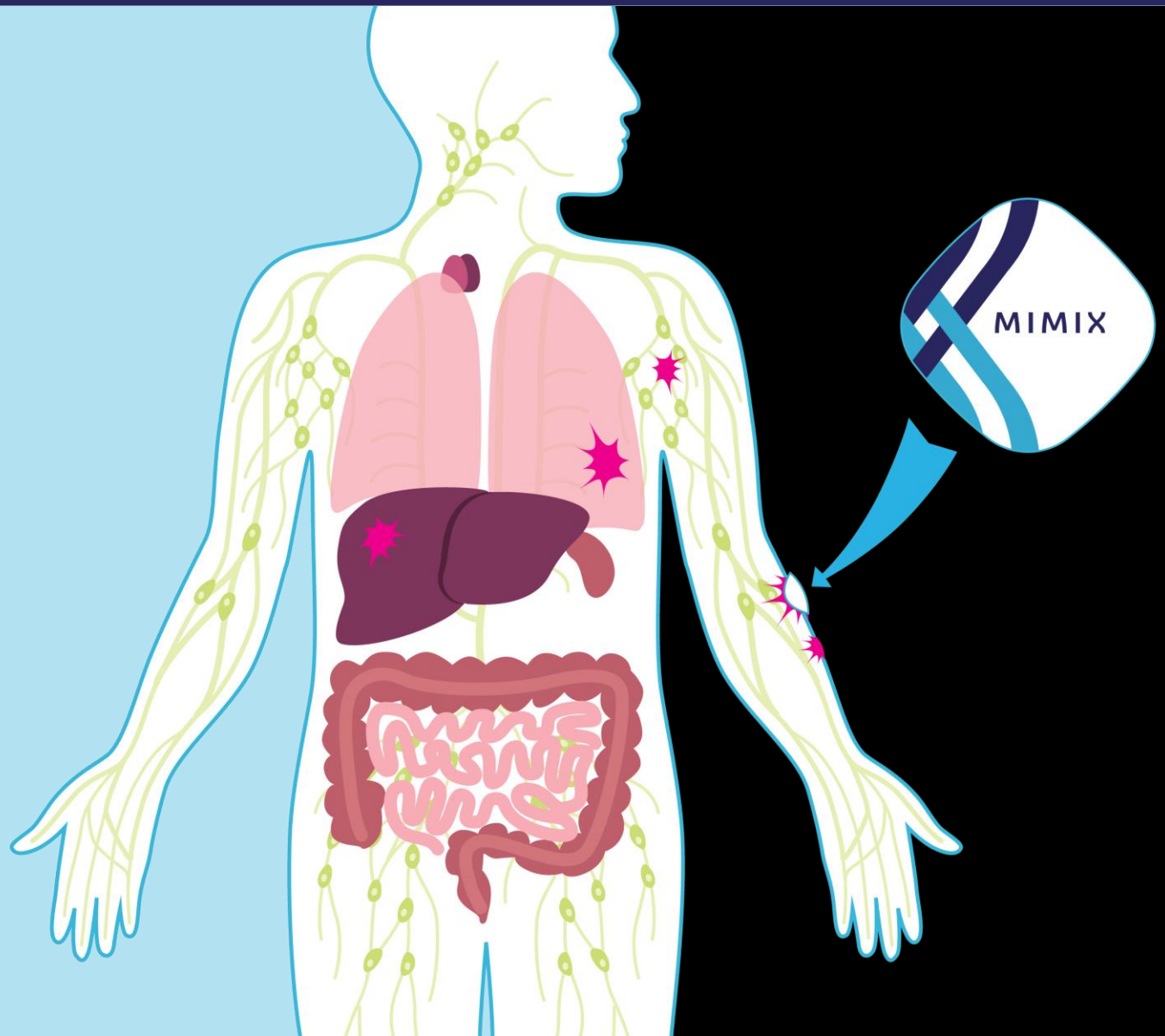


CAR-T cells attacking cancer cells
Photo Source: Sloan Kettering Center, courtesy of Prasad Adusumilli

VAXESS technologies

Activating the immune system to fight cancer with MIMIX

The smart release patch is applied to the a skin lesion.



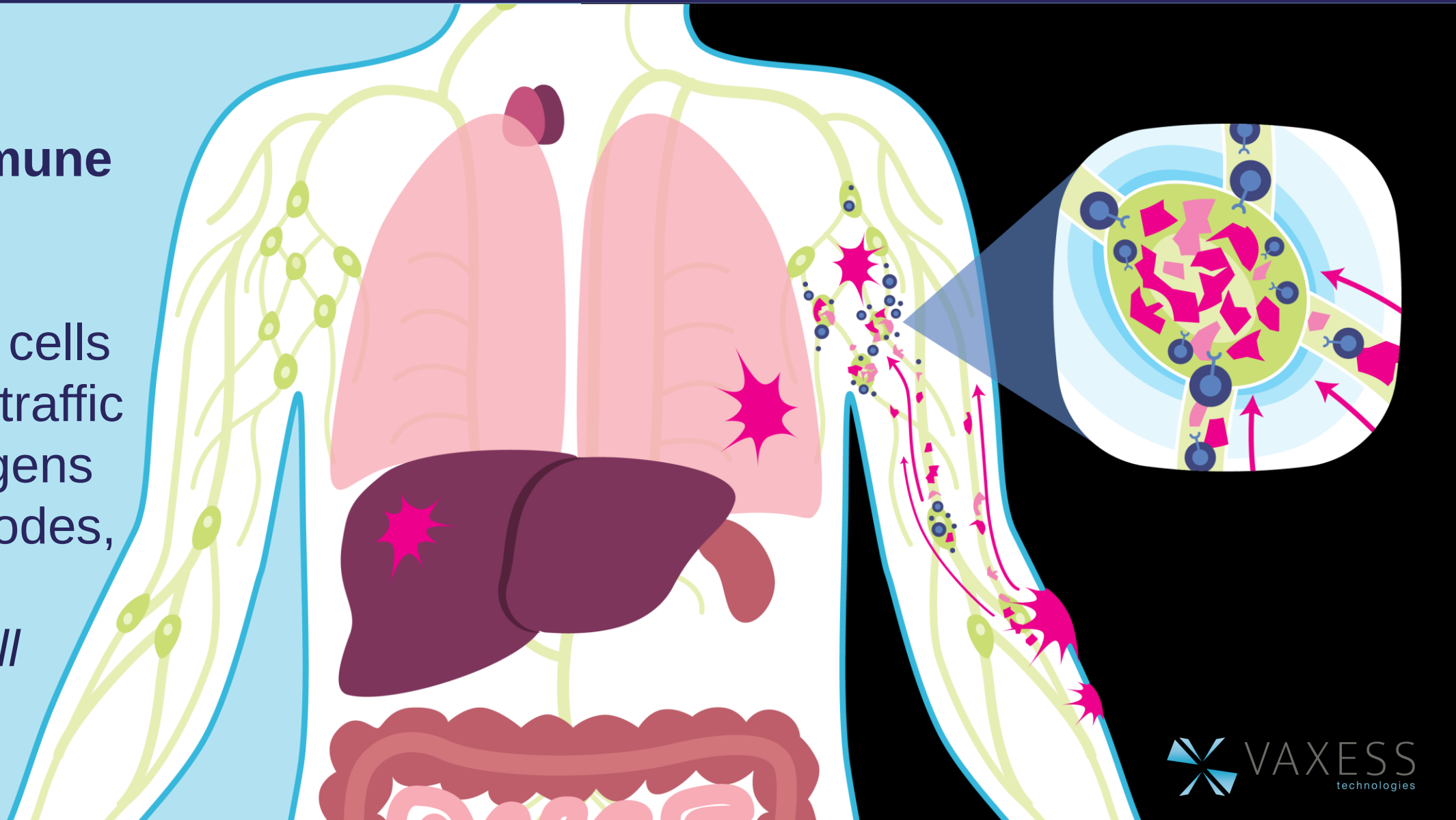
VAXESS technologies

Cell Death Without Toxicity

The agent is released into the tumor, destroying local tumor cells *while minimizing systemic toxicity*

MIMIX Immune Activation

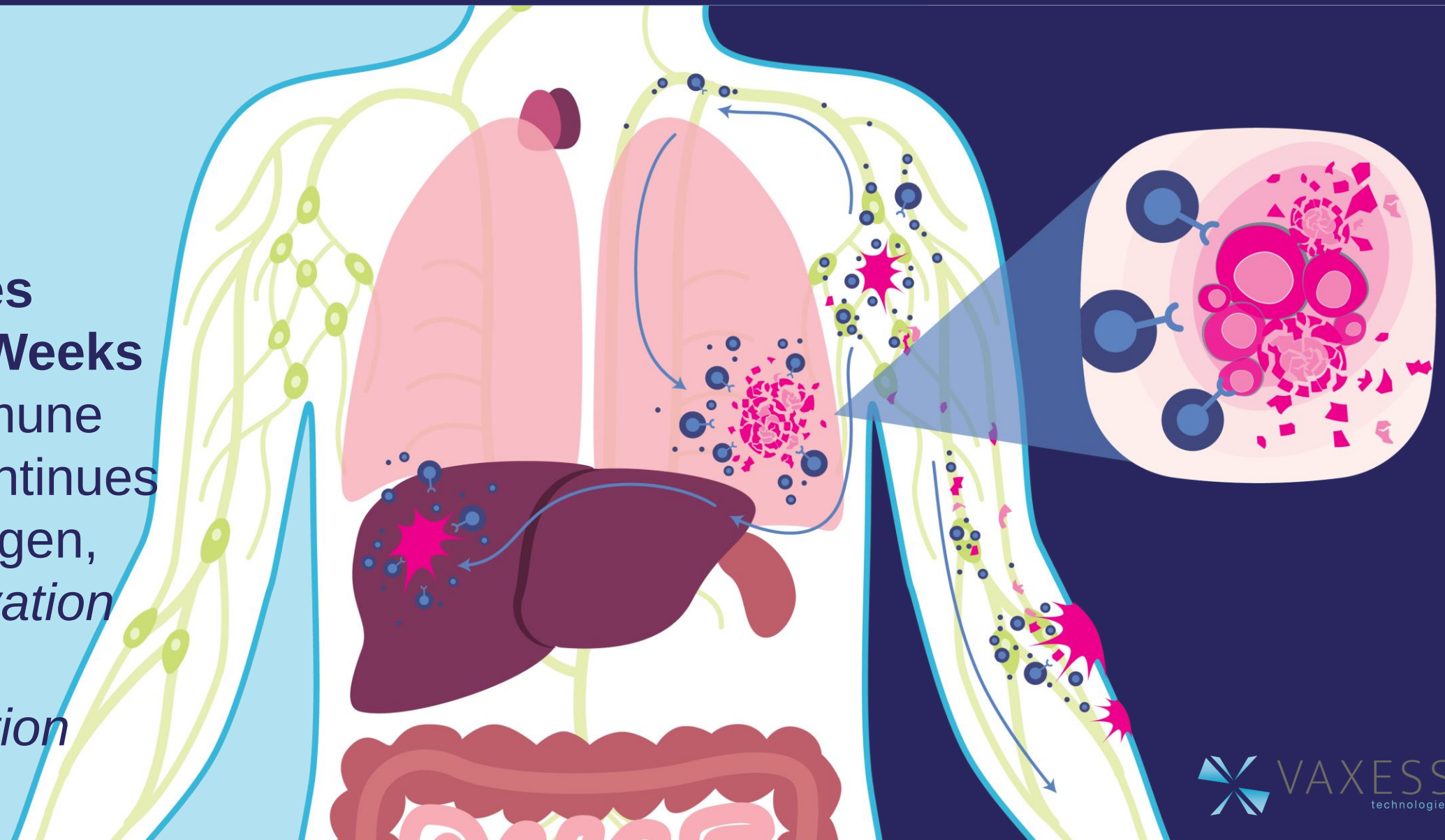
Antigen-presenting cells in the skin traffic tumor antigens to lymph nodes, *triggering potent t-cell responses*



VAXESS technologies

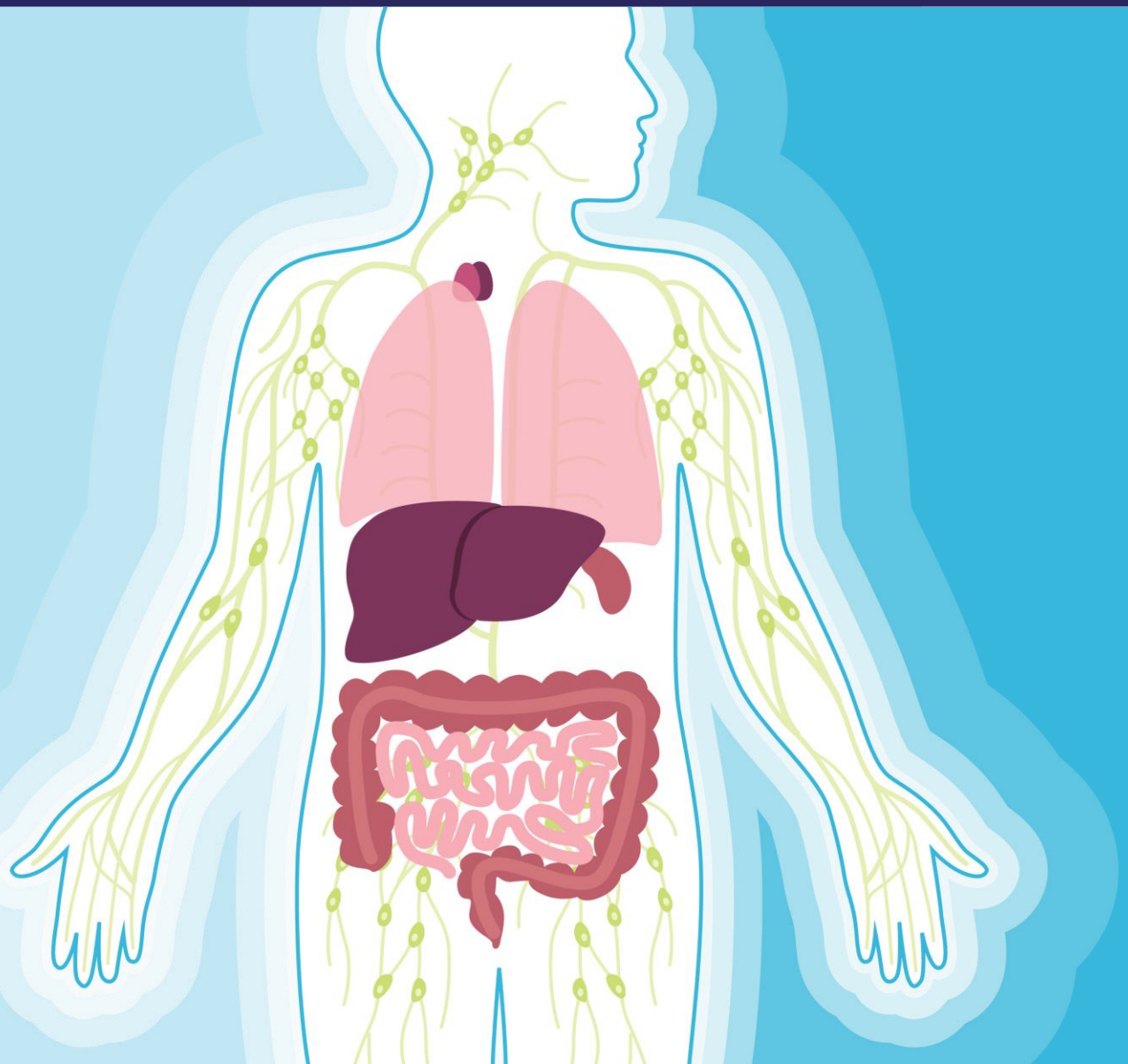
Building Powerful Responses Over 2-3 Weeks

As the immune system continues to see antigen, *T-cell activation and differentiation increases*



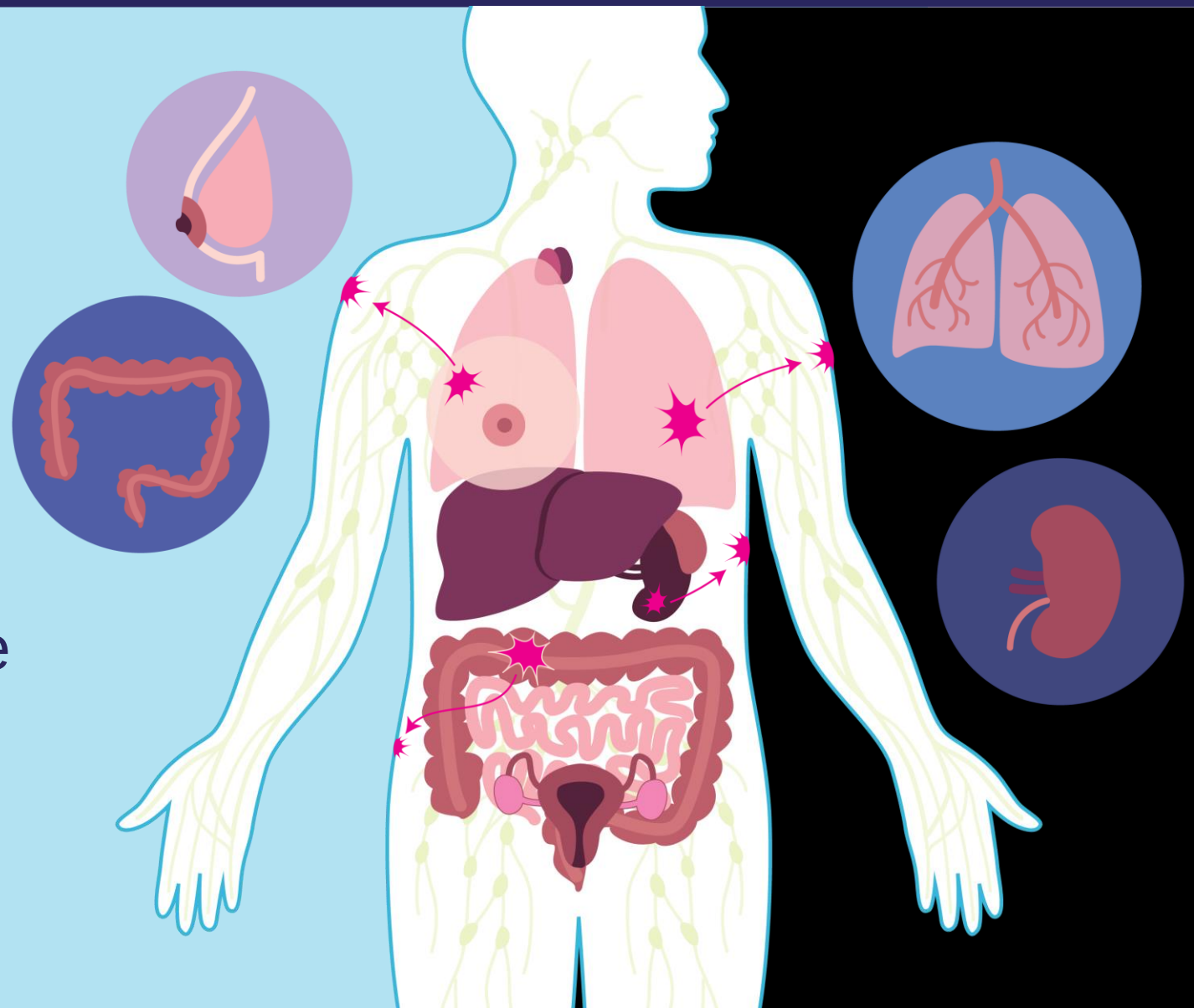
VAXESS technologies

MIMIX Memory
The cancer cells are cleared and *the immune system has been trained, potentially enabling future activation if cancer returns*



Beyond Melanoma

Many other tumors metastasize to the skin, providing suitable “antigen” for MIMIX immune activation



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MIMIX-MR: Translating to impact global health

BILL & MELINDA GATES foundation

POONAWALLA GROUP
SERUM INSTITUTE OF INDIA LTD.

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Measles-rubella (MR) microneedle abbreviated Target Product Profile

Variable	Minimum Target
Target Population	Routine: Infants 9-18 months of age, Campaign: >9 mo age, children, adolescents, and adults at risk
Device safety	• May tolerate increase in local reactogenicity • Waste that is considered infectious, sharps waste that is disposed of according to instructions for use, WHO level and relevant local requirements
Target Population	Routine: Infants 9-18 months of age, Campaign: >9 mo age, children, adolescents, and adults at risk
Vaccine Volume (cm^3 /dose)	One dose per patch; primary container <1 cm3/dose; secondary packaging <5 cm3/dose
Stability / Shelf Life	Shelf life: 24 months at 2- 8° C Stability: Not freeze sensitive
Target Procurement Price	≤US$1.40
Manufacturing Capacities	Up to 50 million patches per year

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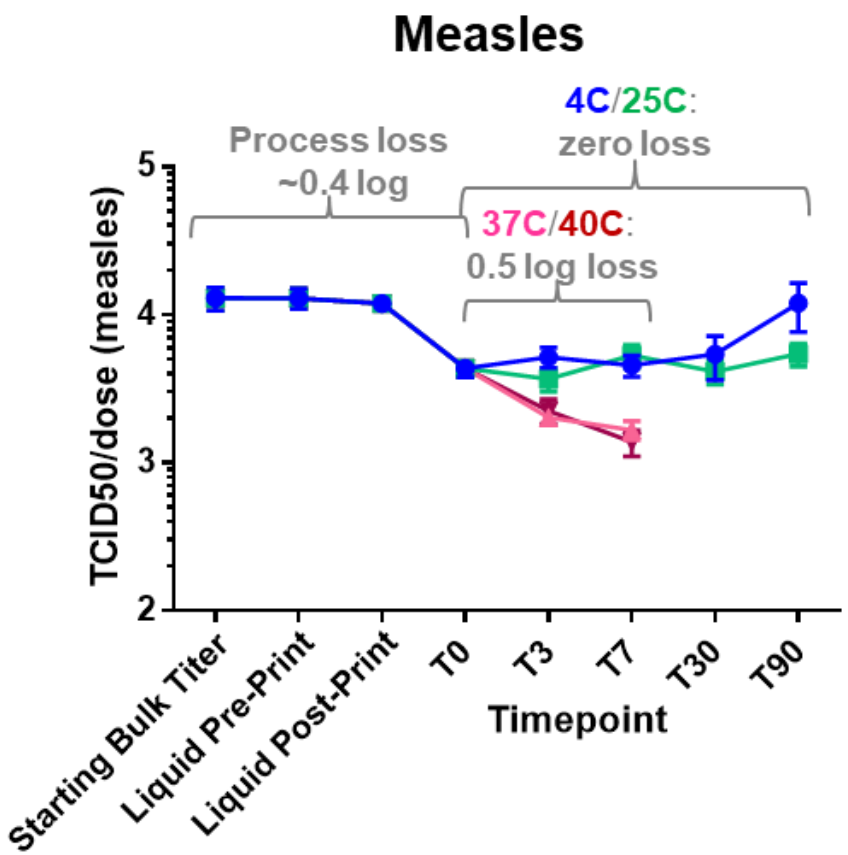
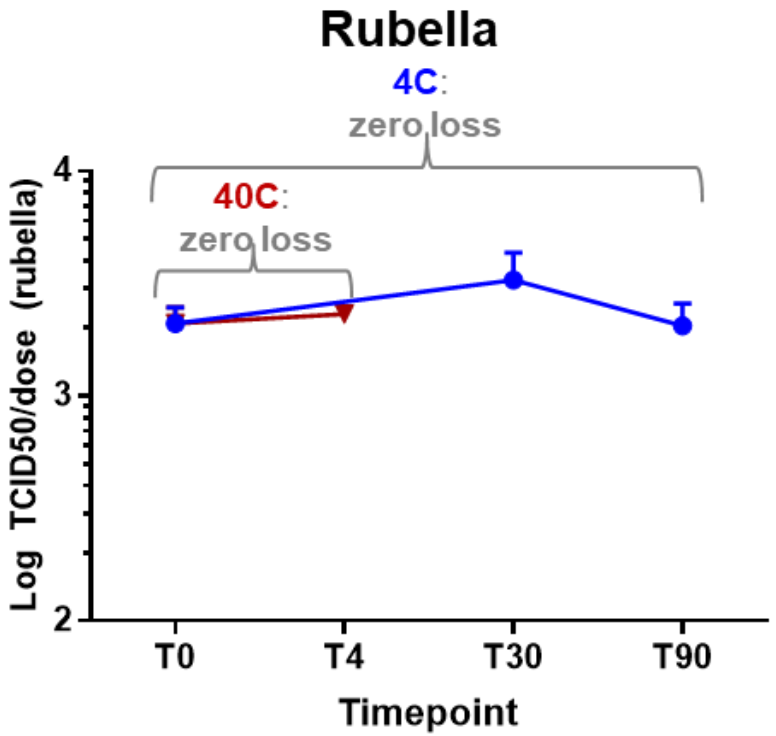
Measles Rubella MN Stability – 1 week at 40˚C and 3 Months at 4˚C





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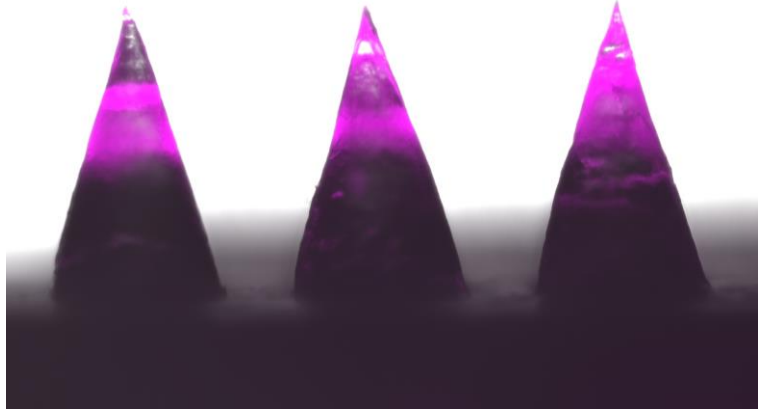
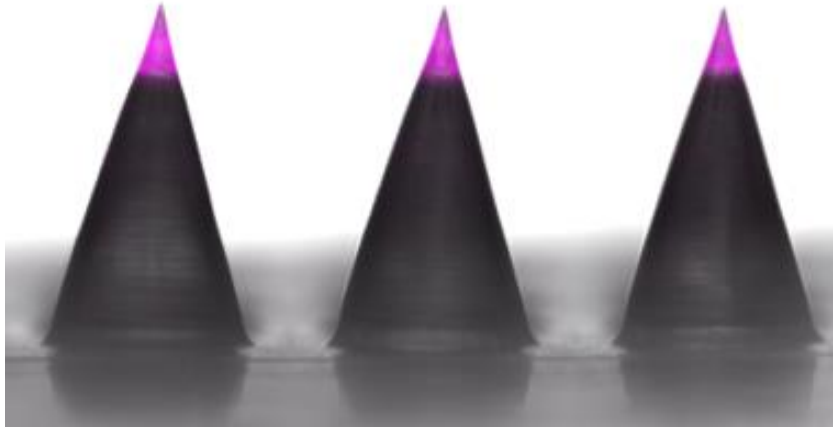
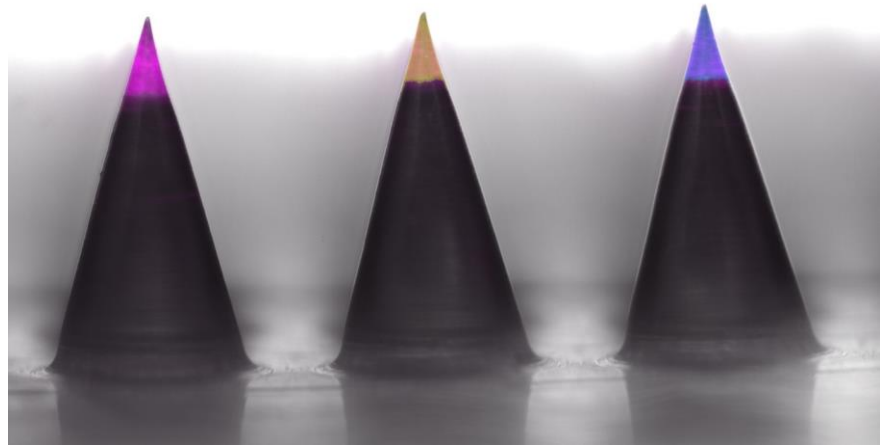
Optimizing for Consistency, Delivery Efficiency, and Flexibility







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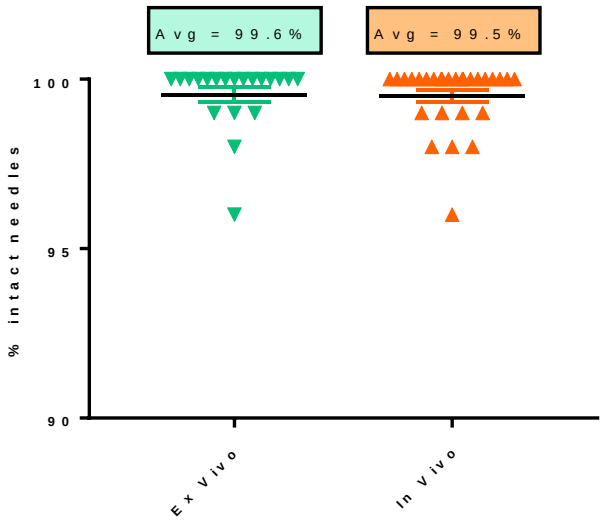
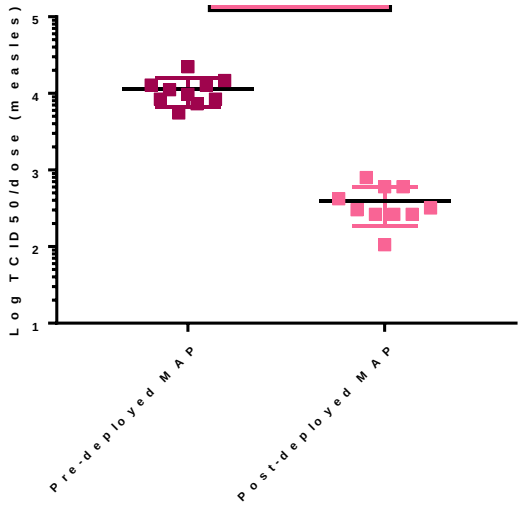
MIMIX™

Manufacturing Improvements Drove High Quality Patches with Consistent Delivery

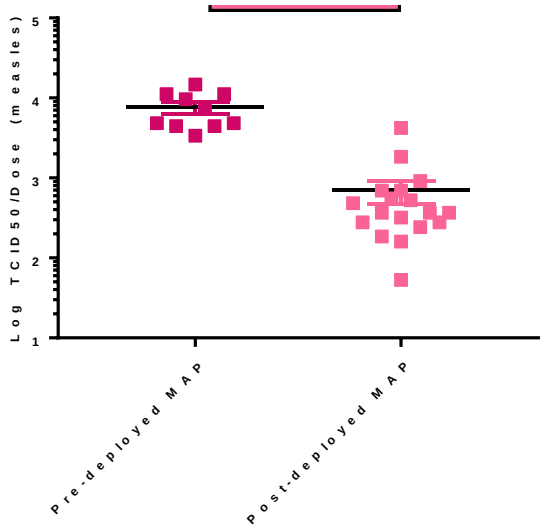
99% needle demolding Efficiency*



97% dose delivered ex vivo



91% dose delivered in vivo



**Demolding efficiency (% intact needles)*

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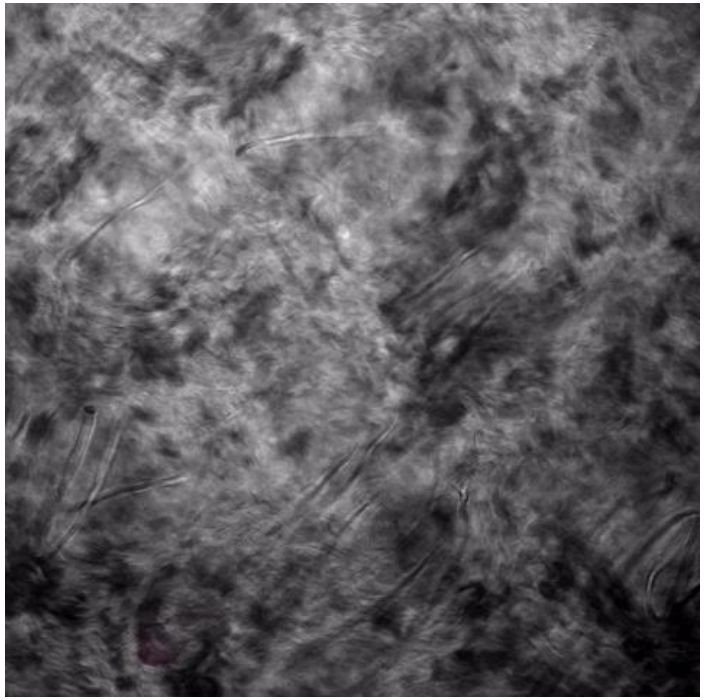
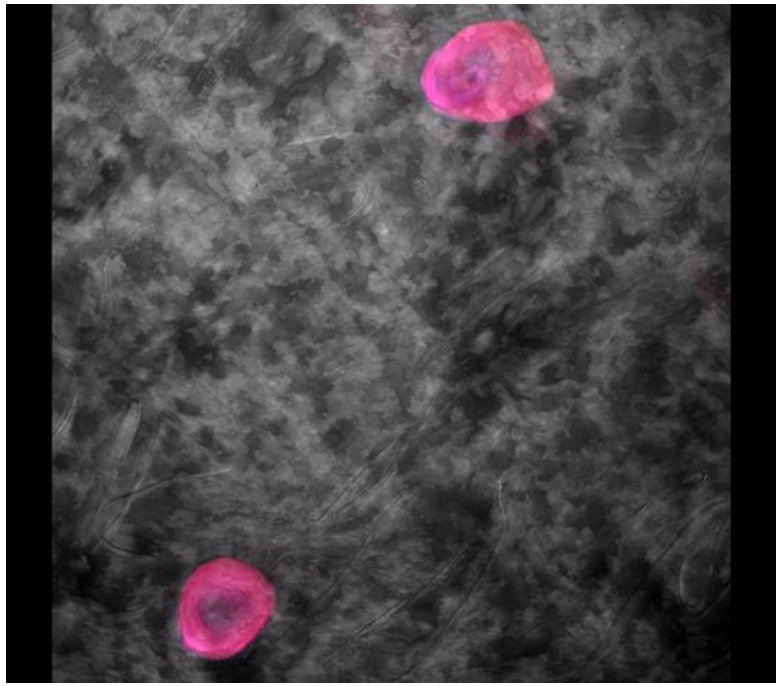
Validating Deployment Depth Using Confocal Microscopy

Tips were imaged in the skin using confocal miscrosopy to validate implantation, tip morphology and deployment depth





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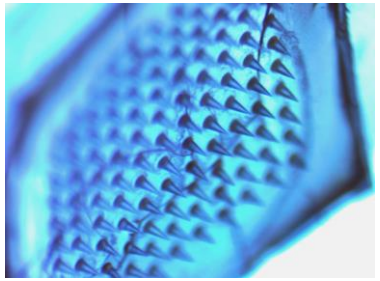
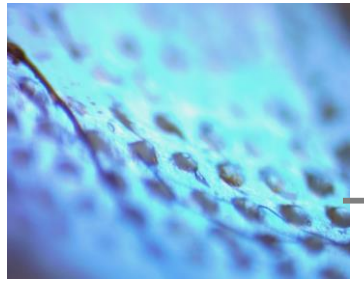
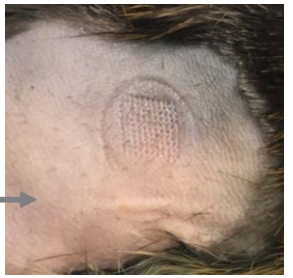
Measles Microarray Patch Vaccine In Vivo Study



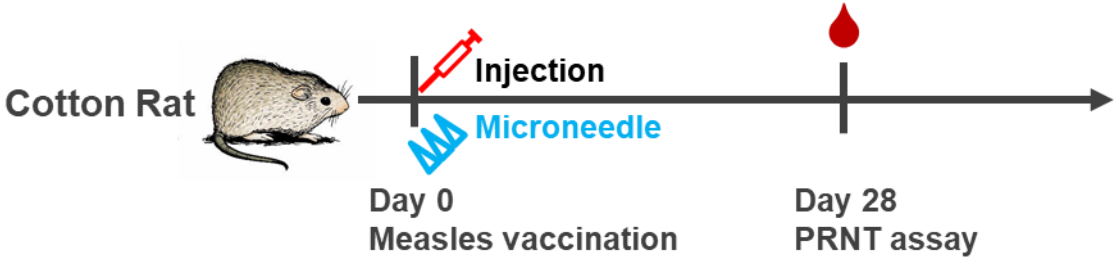
Pre-Application MN



Post-Application MN

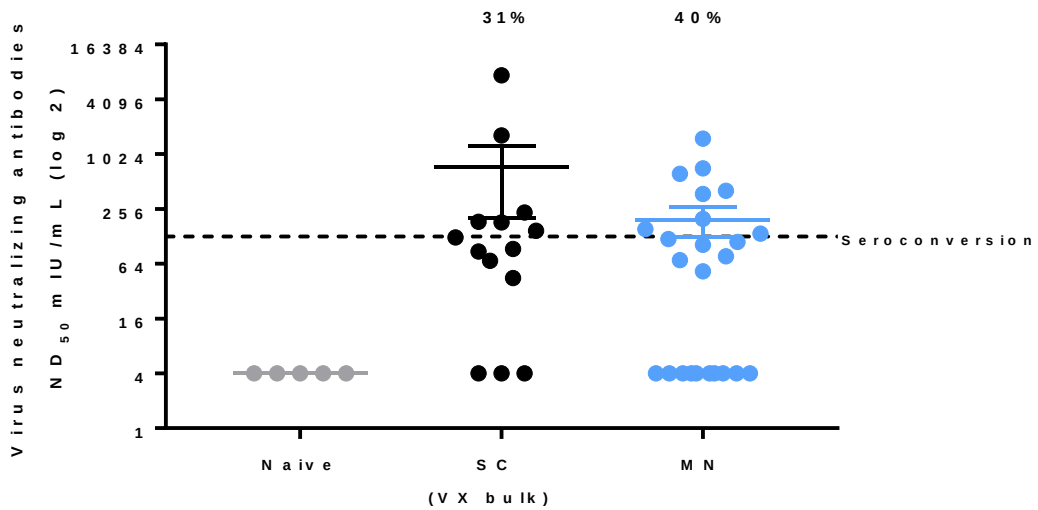


Skin post-deployment



Results: MNs had comparable seroconversion to traditional SC injection

Neutralizing Ab Responses to Measles Vaccine (Day 28)



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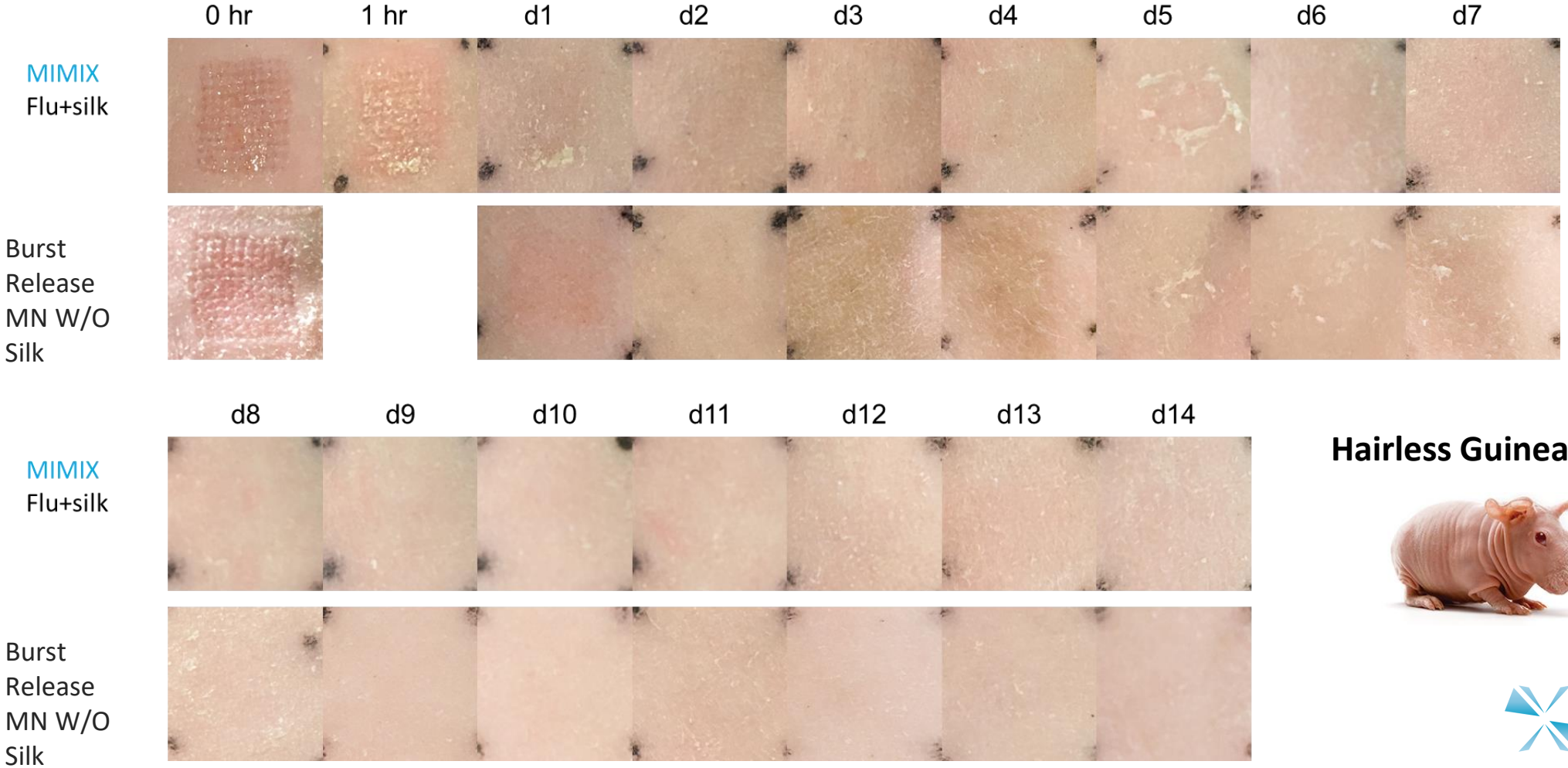
Evaluating Skin Responses in Hairless Guinea Pigs



Hairless Guinea Pig

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Validating Safety/Tox/Reactogenicity

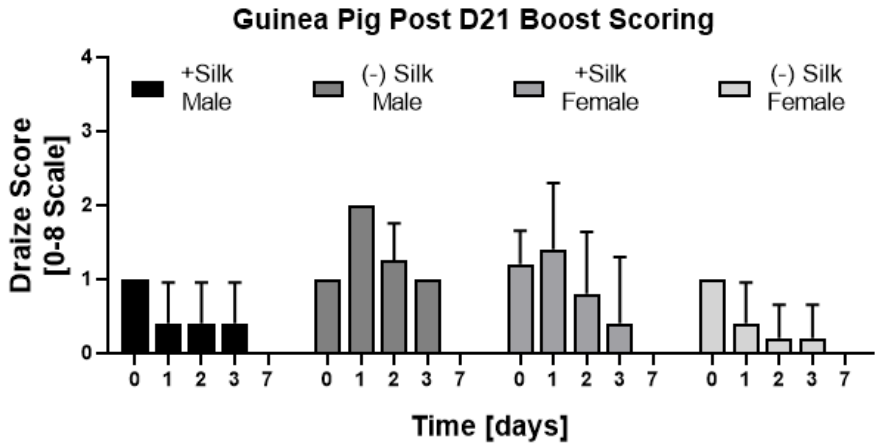
Hairless Guinea Pig

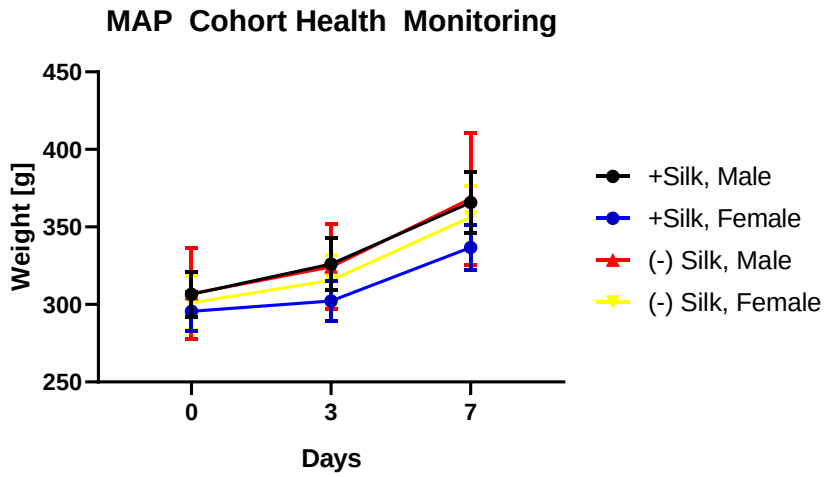
Group #	Type	Sex	Nair?	N
1	MAP	Male	No	5
2	MAP	Female	No	5
3	MAP (-silk)	Male	No	5
4	MAP (-silk)	Female	No	5

Day 0
- Prime
- Weight, Draize

Day 21
- Boost
- Weight, Draize

Day 42
- Takedown (5/group)
- CLINPATH, Hematology





All patches were well tolerated. No safety concerns or evidence of toxicity for silk through MAP, ID or SQ

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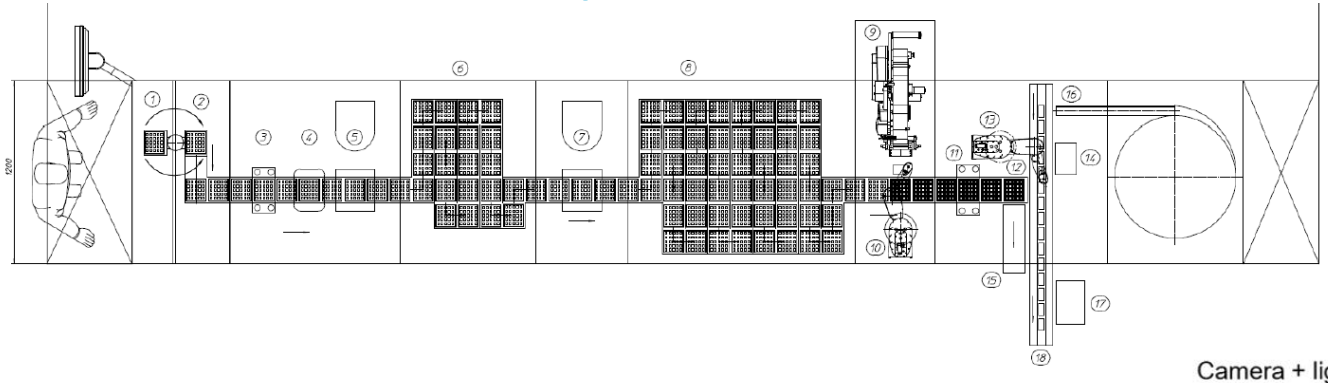
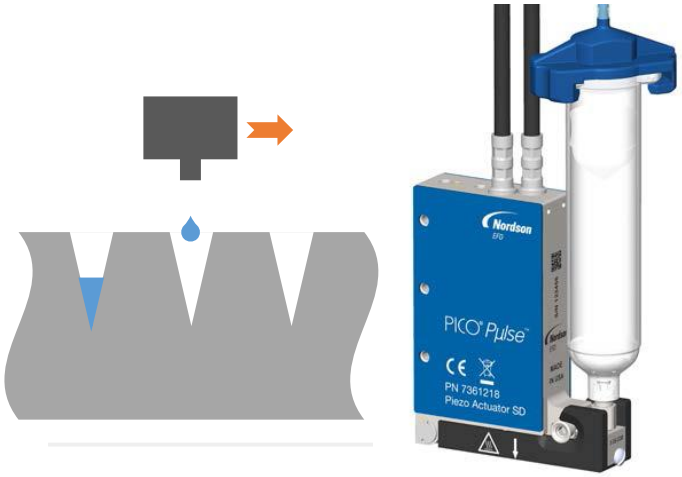
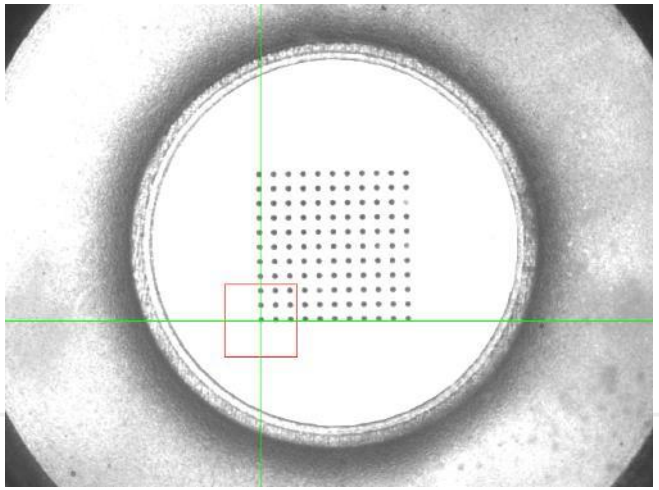
20M Patch/Year Scalable Manufacturing Line Plan Developed and Unit Ops Validated



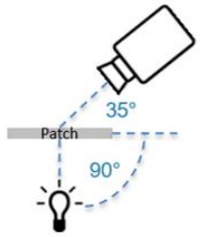


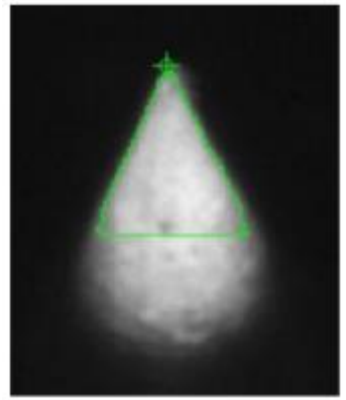
Individual needle filling



Vision-guided printing screenshot

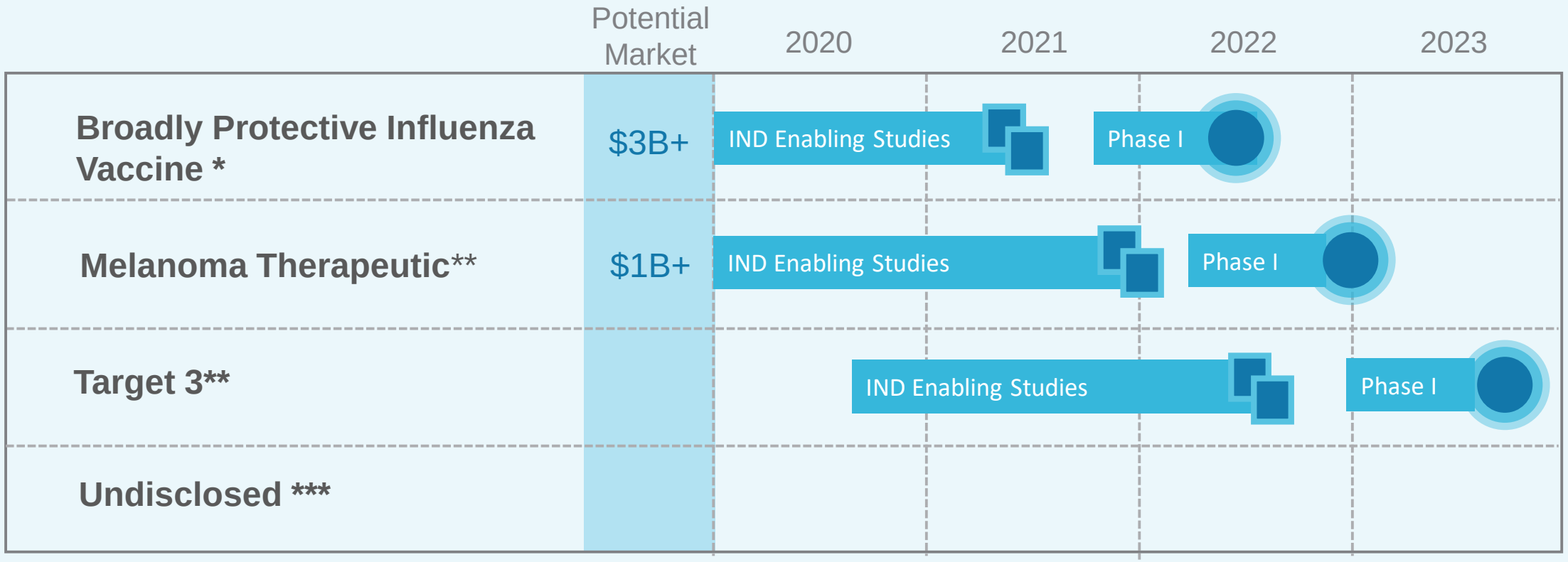
Camera + light setup:





Machine vision inspection of demolded needle

Vaxess is moving multiple programs into the clinic in 2021-2022



*In-house Development with API from GC Pharma ** In-house Development with off-patent molecule ***Partner Joint Development

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