A photograph of medical supplies on a dark surface. In the center is a small glass vial with an orange cap and a white label. Surrounding it are several syringes with red plunger tips. In the foreground, there is a blister pack containing several white, circular microneedle patches. One patch is partially removed, showing a green grid of needles.

Measles and rubella vaccination using a microneedle patch

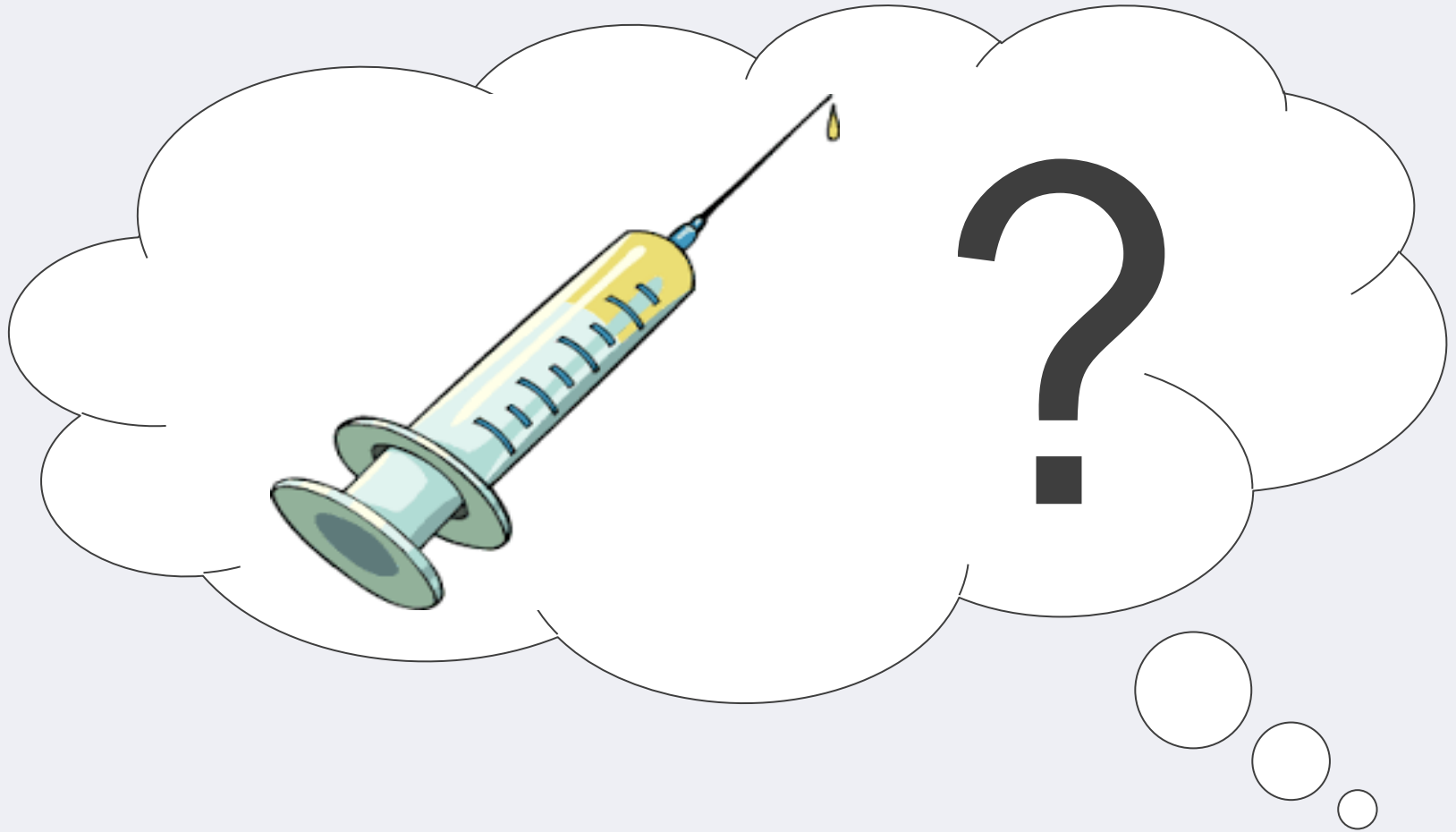
Mark R. Prausnitz

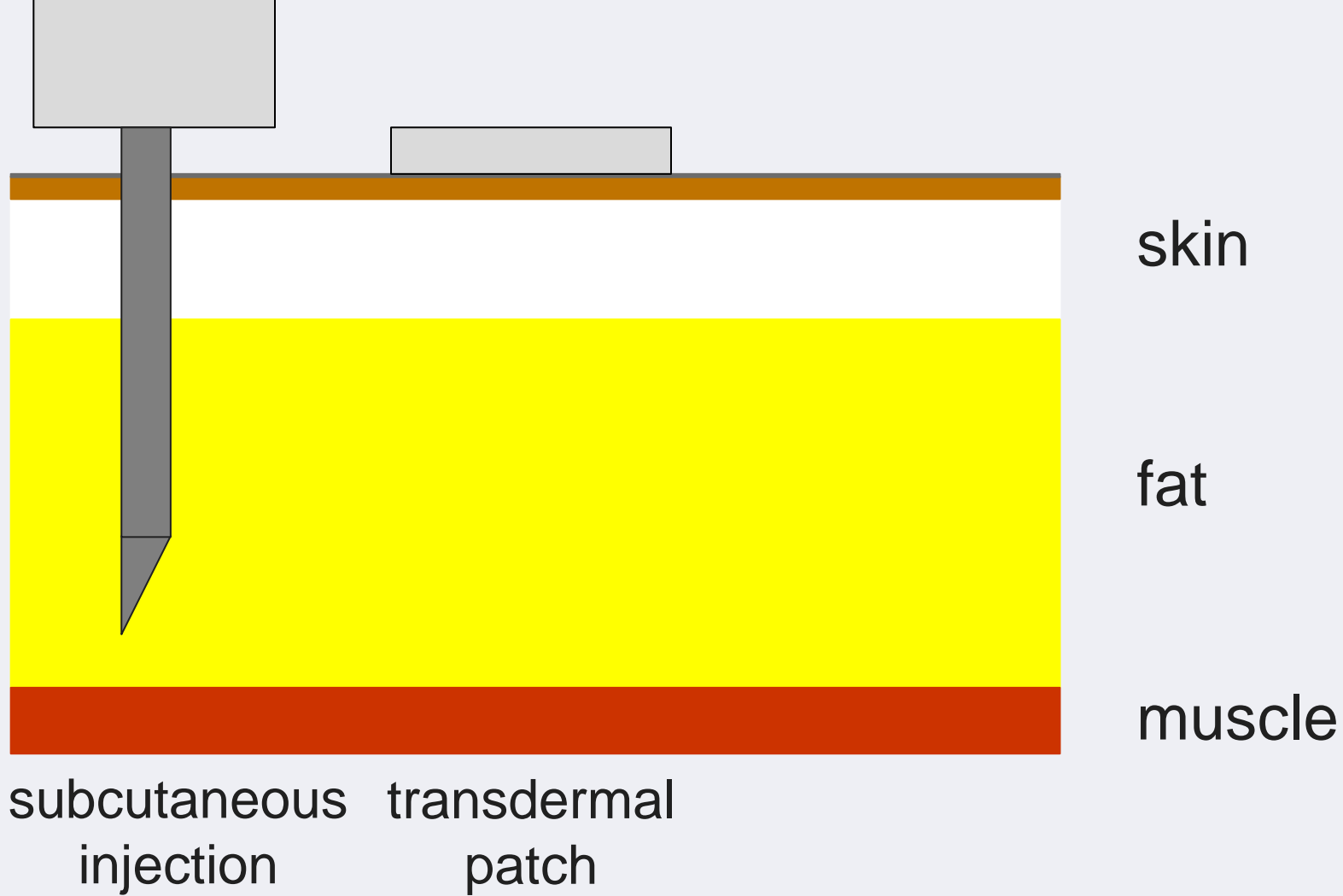
Georgia Institute of Technology

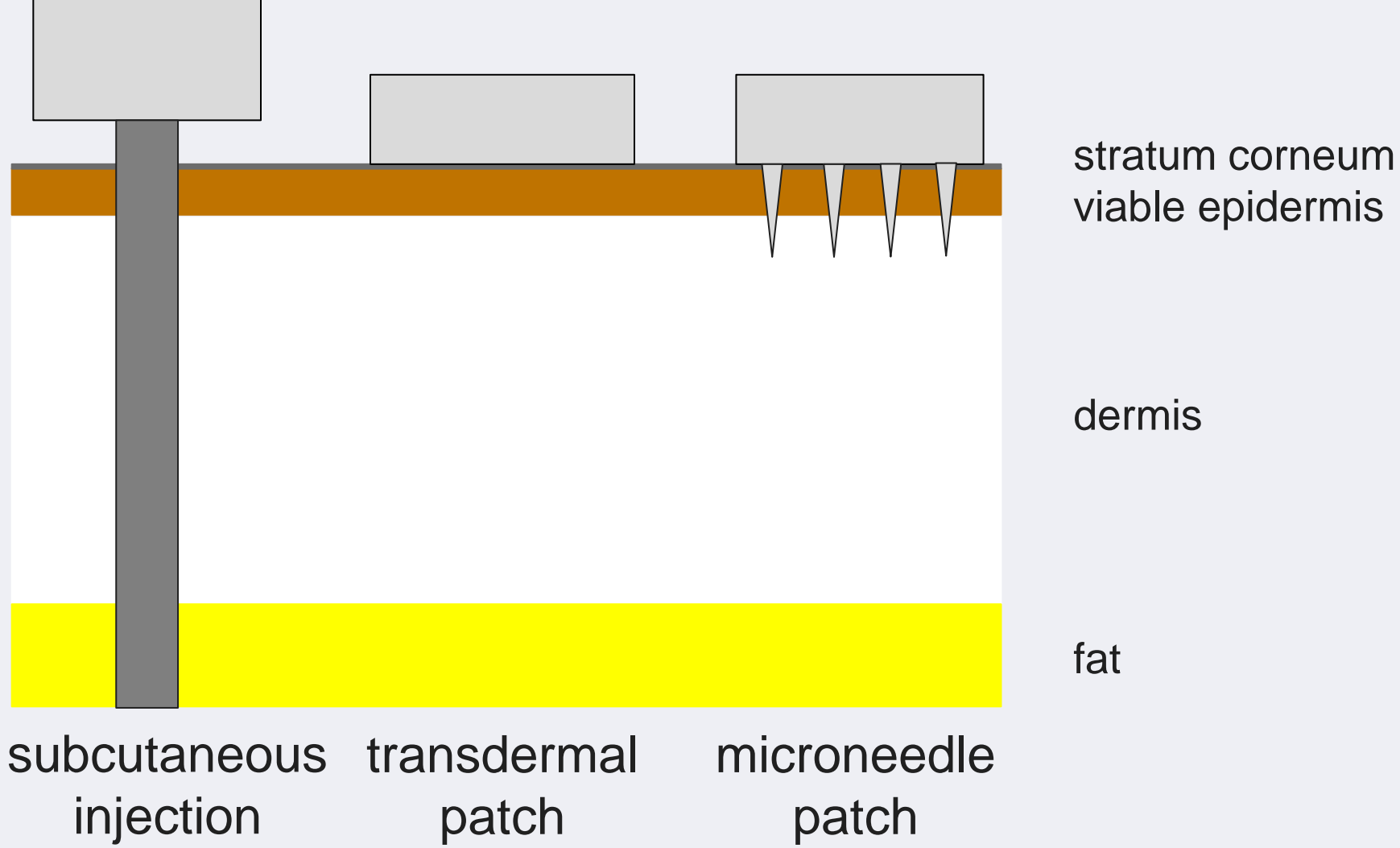
Disclosure:

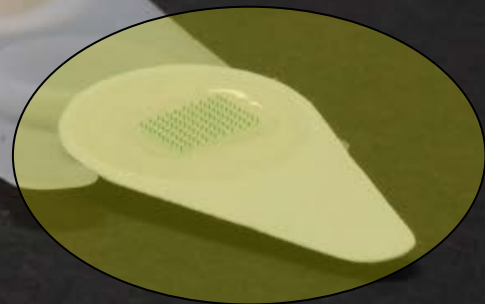
Mark Prausnitz is a founder, officer and shareholder in Micron Biomedical, Inc., which is developing microneedle patch technology.



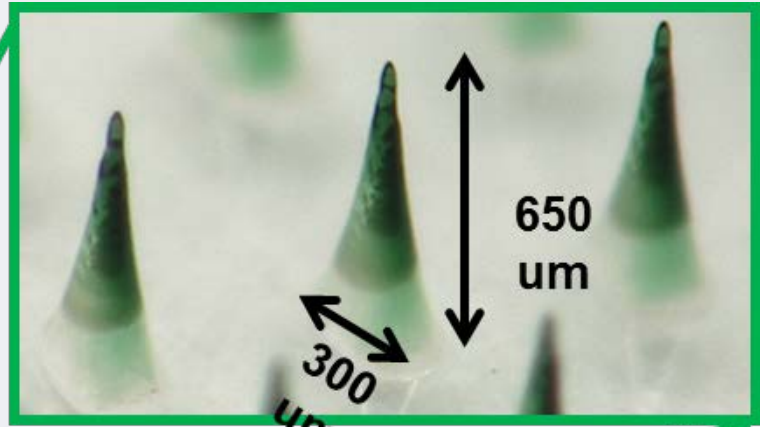
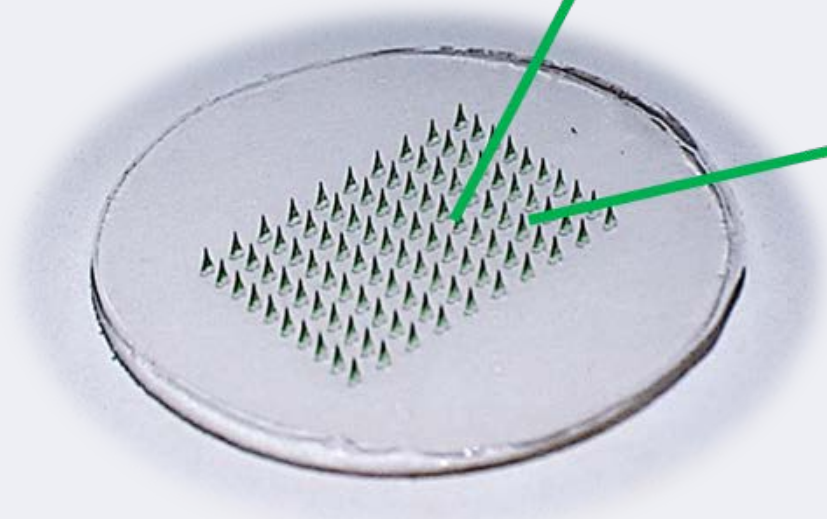














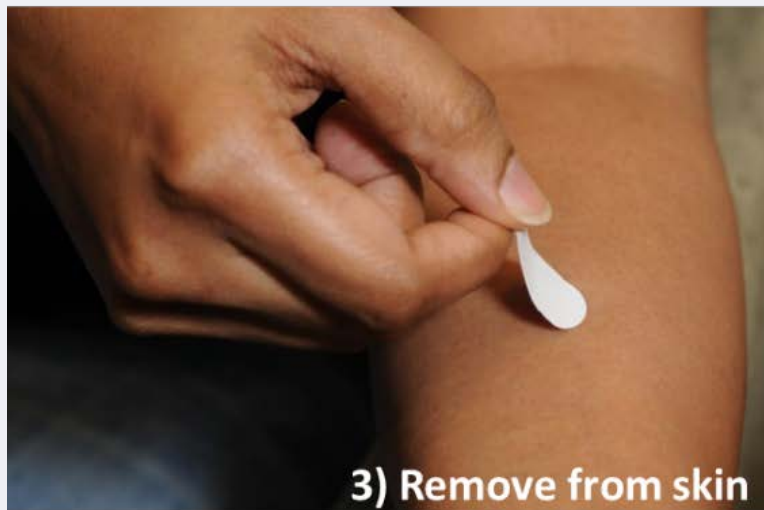
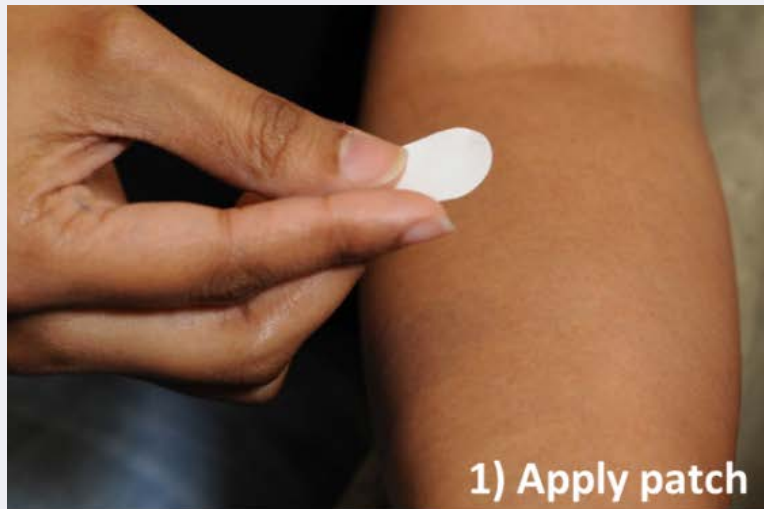


Patient administration

Transportation and storage

Waste disposal

Manufacturing



Patient administration

- Minimally trained personnel
- No applicator, no reconstitution
- Painless delivery, no fear of needles



Georgia Institute of
Tech

MEASLES AND RUBELLA VIRUS VACCINE LIVE

50
DOSES

Patches for administration to skin
Store at room temperature
See enclosed package insert

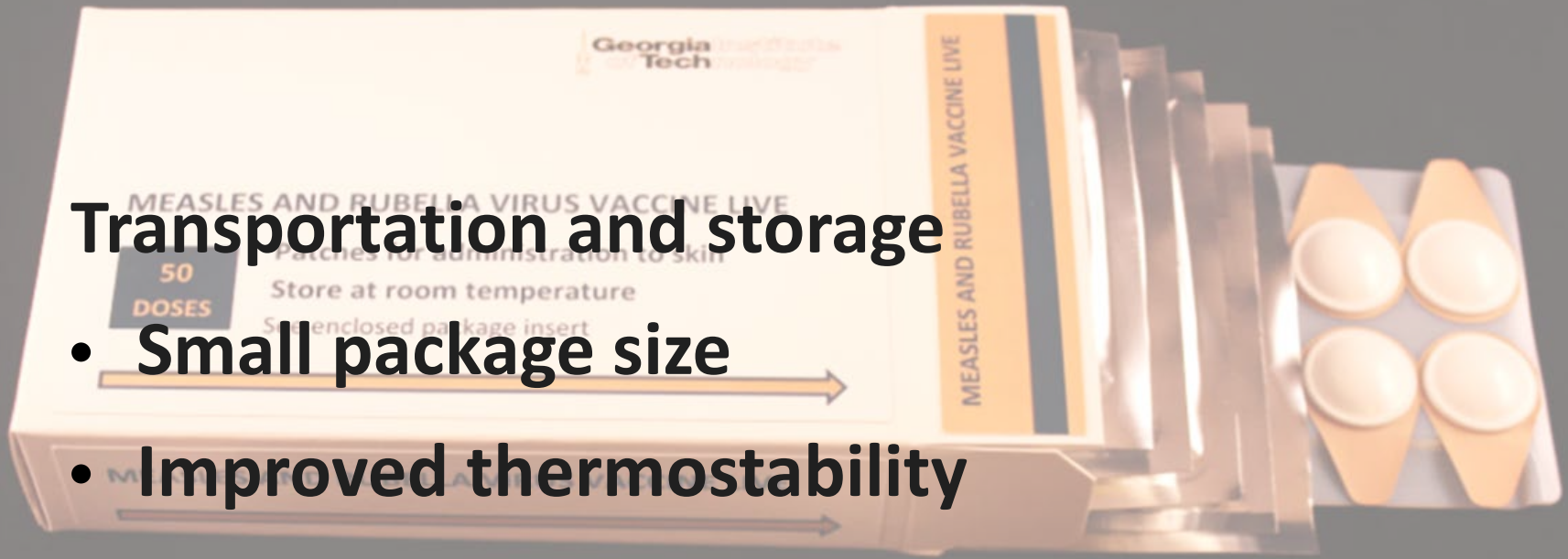
MEASLES AND RUBELLA VACCINE LIVE

MEASLES AND RUBELLA VIRUS VACCINE LIVE



Transportation and storage

- Small package size
- Improved thermostability



0 min

200 μm

A fluorescence microscopy image showing five red, cone-shaped structures arranged in a horizontal row. The structures are bright red at the top and become darker towards the base. The background is black. In the top left corner, the text "0 min" is displayed in white. In the bottom right corner, the text "200 μm" is displayed in white, with a white horizontal scale bar below it.

1 min

200 μm



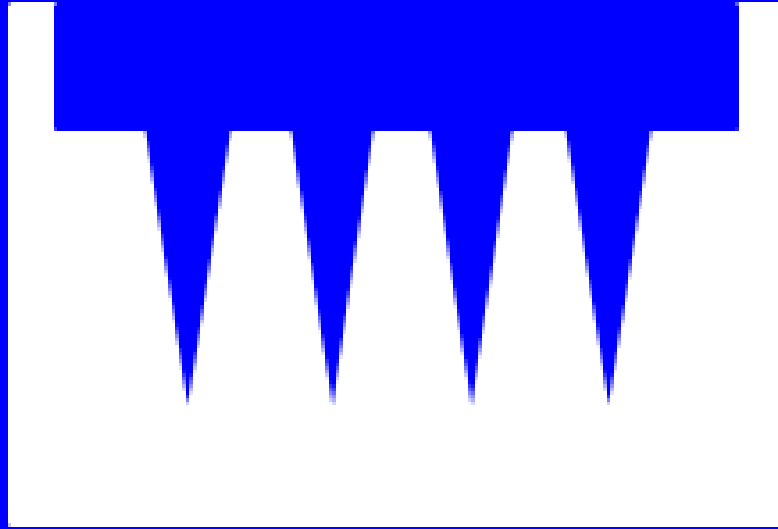
5 min

200 μm

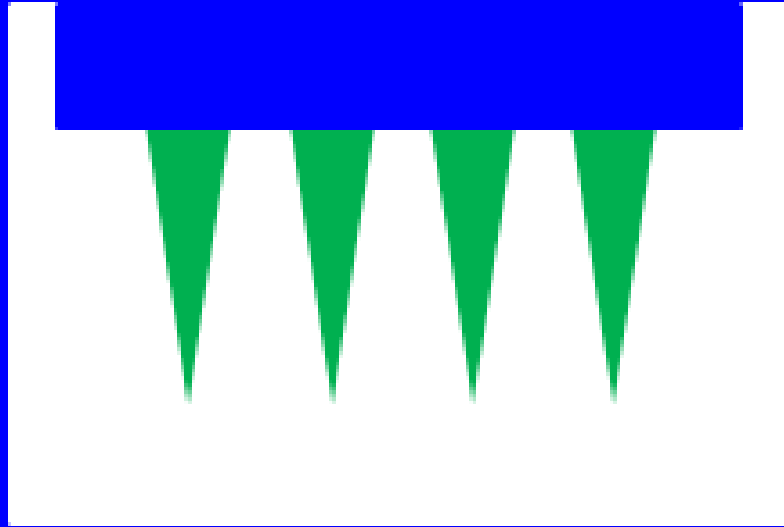
A fluorescence microscopy image showing a network of red fluorescent structures. The structures appear as interconnected, somewhat diffuse red regions against a dark background. The text "5 min" is located in the top left corner. In the bottom right corner, there is a scale bar labeled "200 μm".

Waste disposal

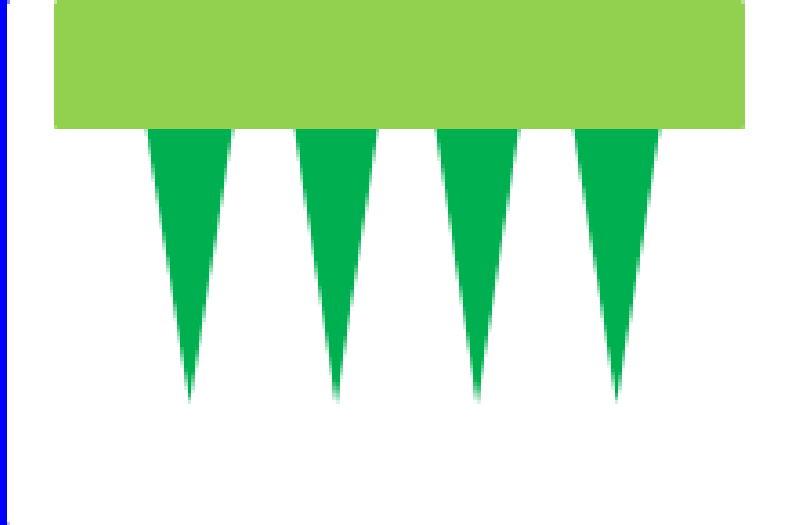
- **Impossible to reuse**
- **Reduced disposal volume**



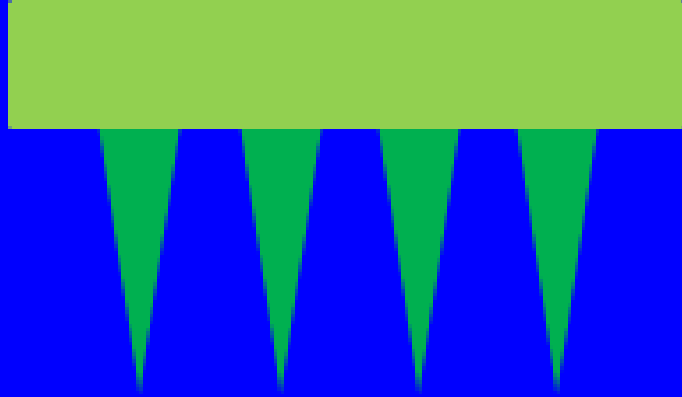
Prepare microneedle mold



Cast antigen formulation onto mold

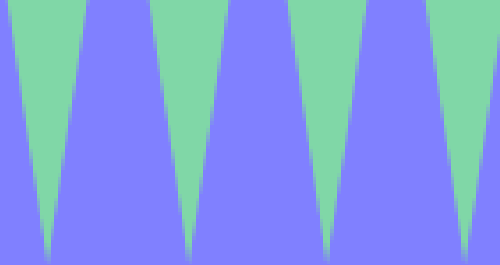


Cast matrix formulation onto mold



Dry and remove microneedle patch

Low-cost, scalable manufacturing



A pair of hands wearing blue nitrile gloves is holding a white tray. The tray contains several orange, adhesive patches of various shapes, including circles and ovals. The background is a soft, out-of-focus light color.

Mock vaccination demonstration

1. Stand on the right side of your table
2. Put out your wrist for “vaccination”
3. Sit down once “vaccinated”
4. Return the patch at the end

The patches contain no microneedles and no vaccine!



THE LANCET

Volume 390 · Number 10 095 · Pages 625-714 · August 12-18, 2017

www.thelancet.com

"This first-in-man study shows that the use of a single dissolvable microneedle patch for influenza vaccination was well tolerated, resulted in robust antibody responses, and was preferred over conventional influenza vaccination with needles and syringes."

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Editorial

Genome editing: science, ethics, and public engagement
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Articles

Azithromycin for adults with persistent uncontrolled asthma
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Articles

Foley catheterisation versus oral misoprostol for induction of labour in India
See page 669

Seminar

Haemolytic uraemic syndrome
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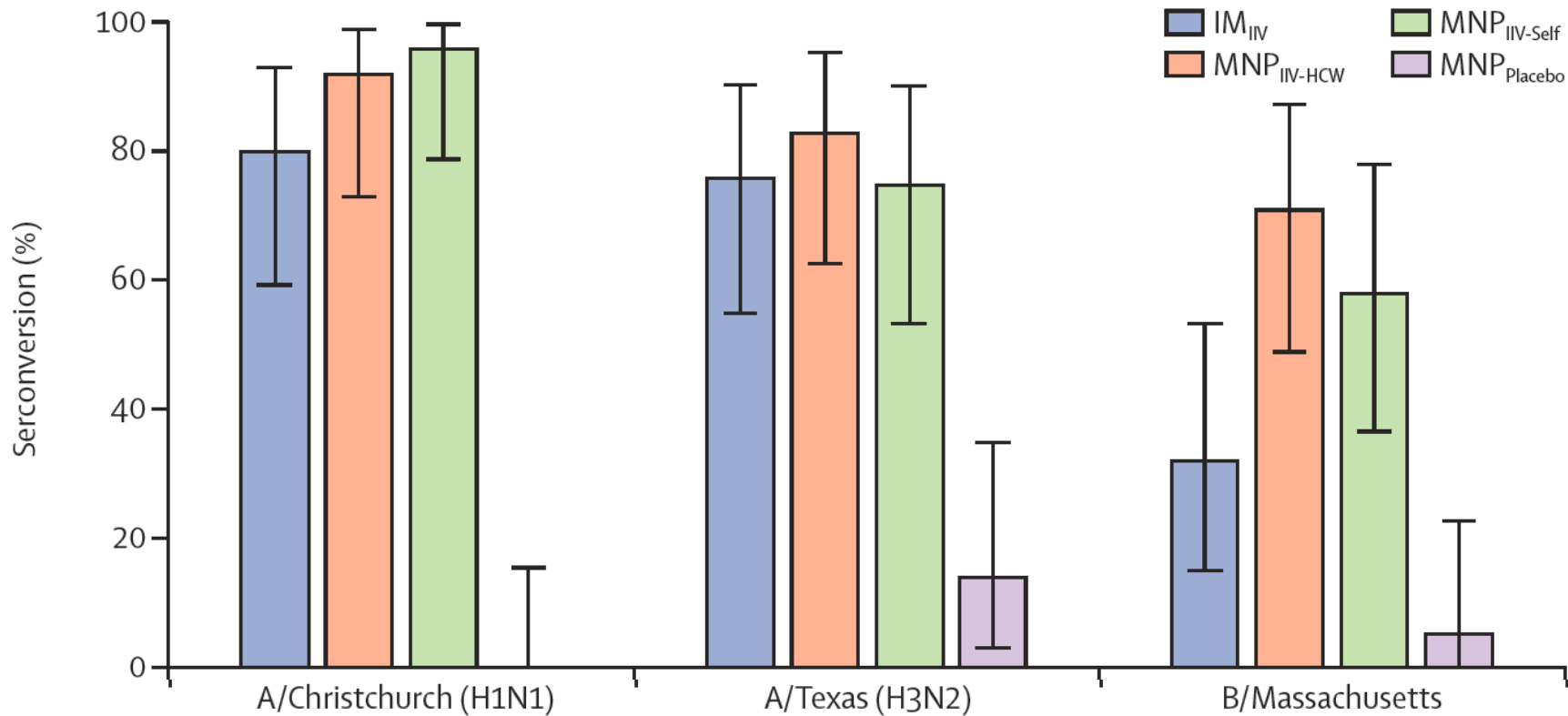
Seminar

Influenza
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THE LANCET

“This first-in-man study shows that the use of a single dissolvable microneedle patch for influenza vaccination was well tolerated, resulted in robust antibody responses, and was preferred over conventional influenza vaccination with needles and syringes.”

Seroconversion



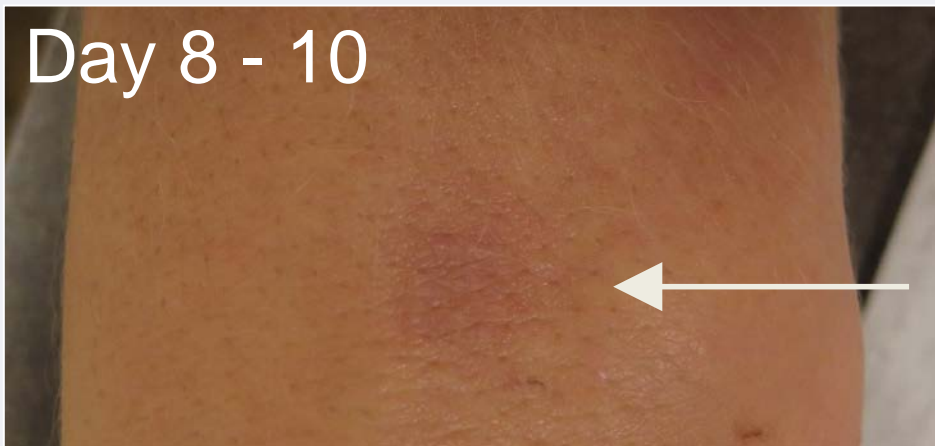
Day 0



Day 2 - 3



Day 8 - 10



Day 28 (\pm 2 days)



Field evaluation of vaccination in Ghana

Sarah McGray, PATH

