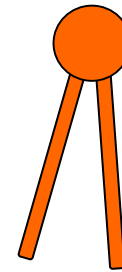
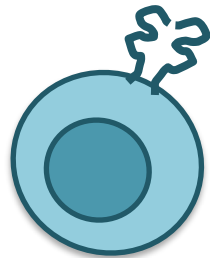


# The Skin We Move In

*A story of Ts, Bees, and Wax*

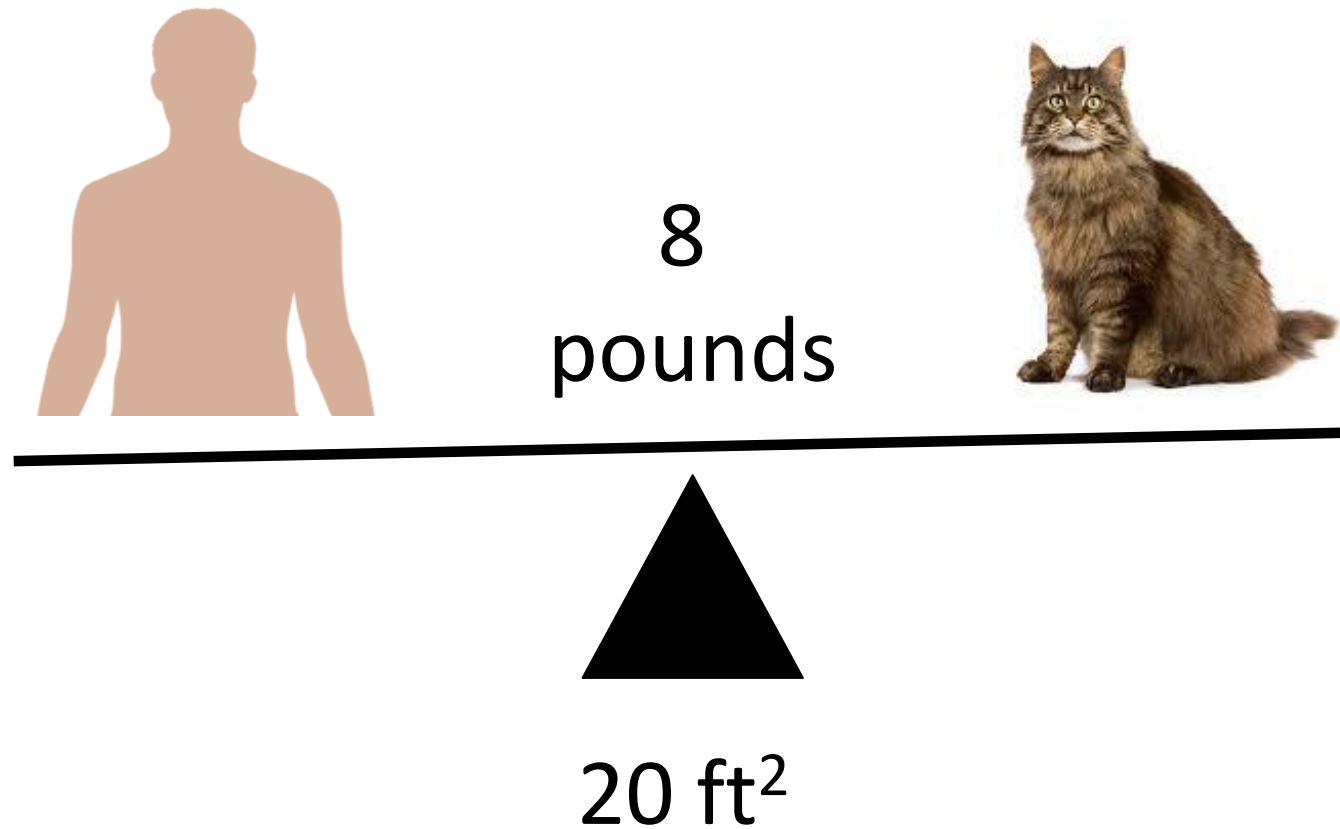


Rachel Nicole Cotton

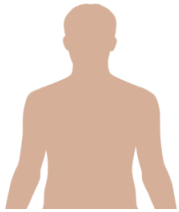
PhD Candidate, Harvard Immunology Program

DayCon 2016

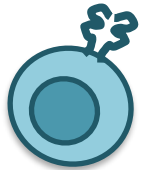
# Skin is the body's largest organ



# Roadmap



1. What does skin do?

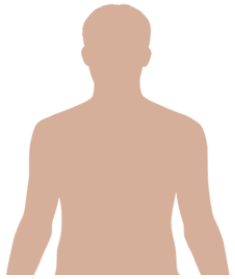


1. Skin lipids and skin immunity



2. How bee venom stirs up a buzz

# Roadmap



1. What does skin do?

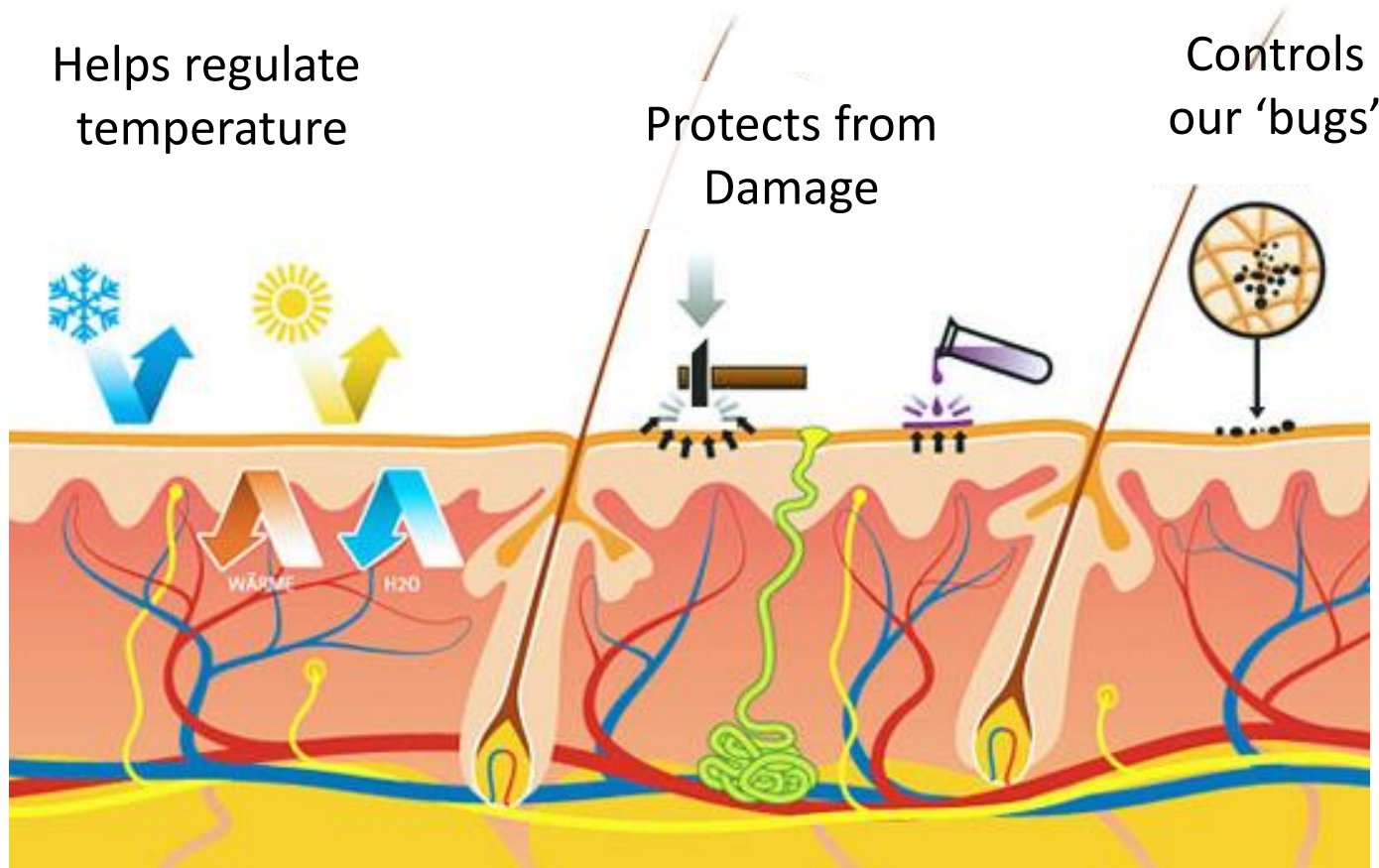


1. Skin lipids and skin immunity



2. How bee venom stirs up a buzz

# Keeps our insides in and the outside out



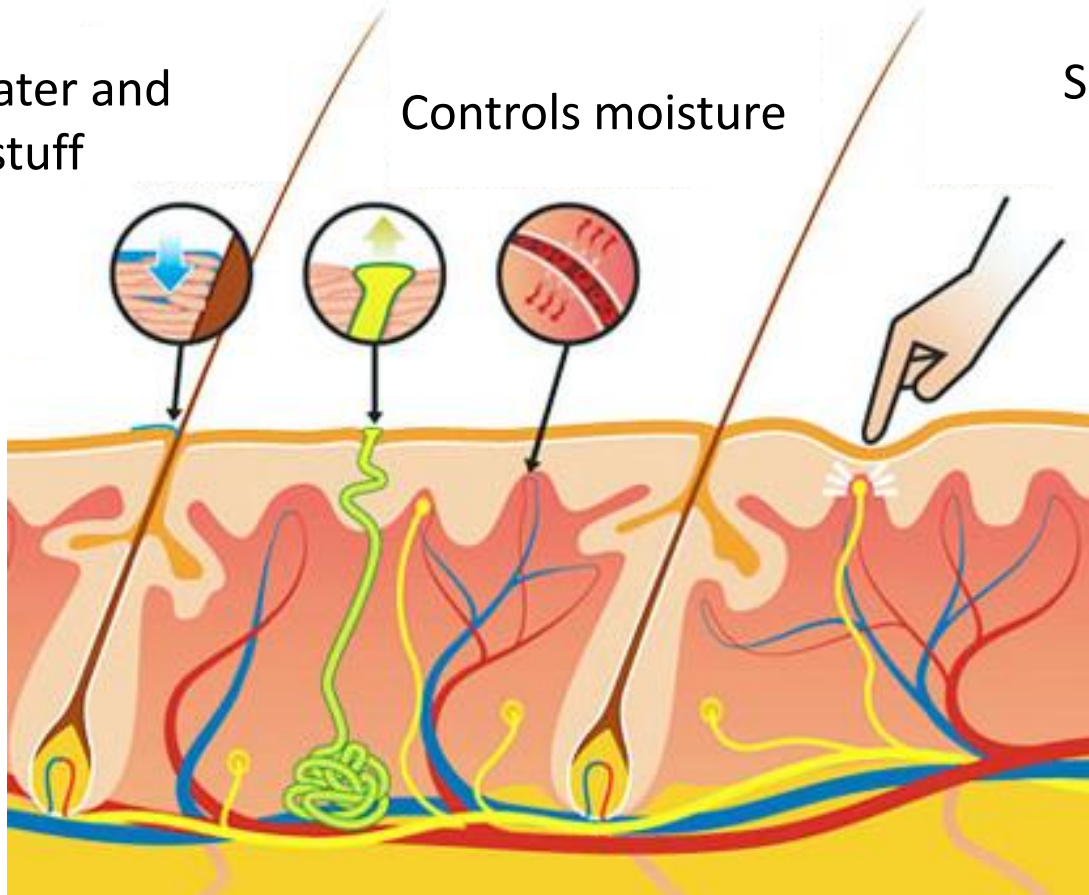
B. Braun | Sharing Expertise.

# Communicates with our environment

Absorbs water and other stuff

Controls moisture

Senses pressure, heat and cold



B. Braun | Sharing Expertise.

# Sweat glands let the water out

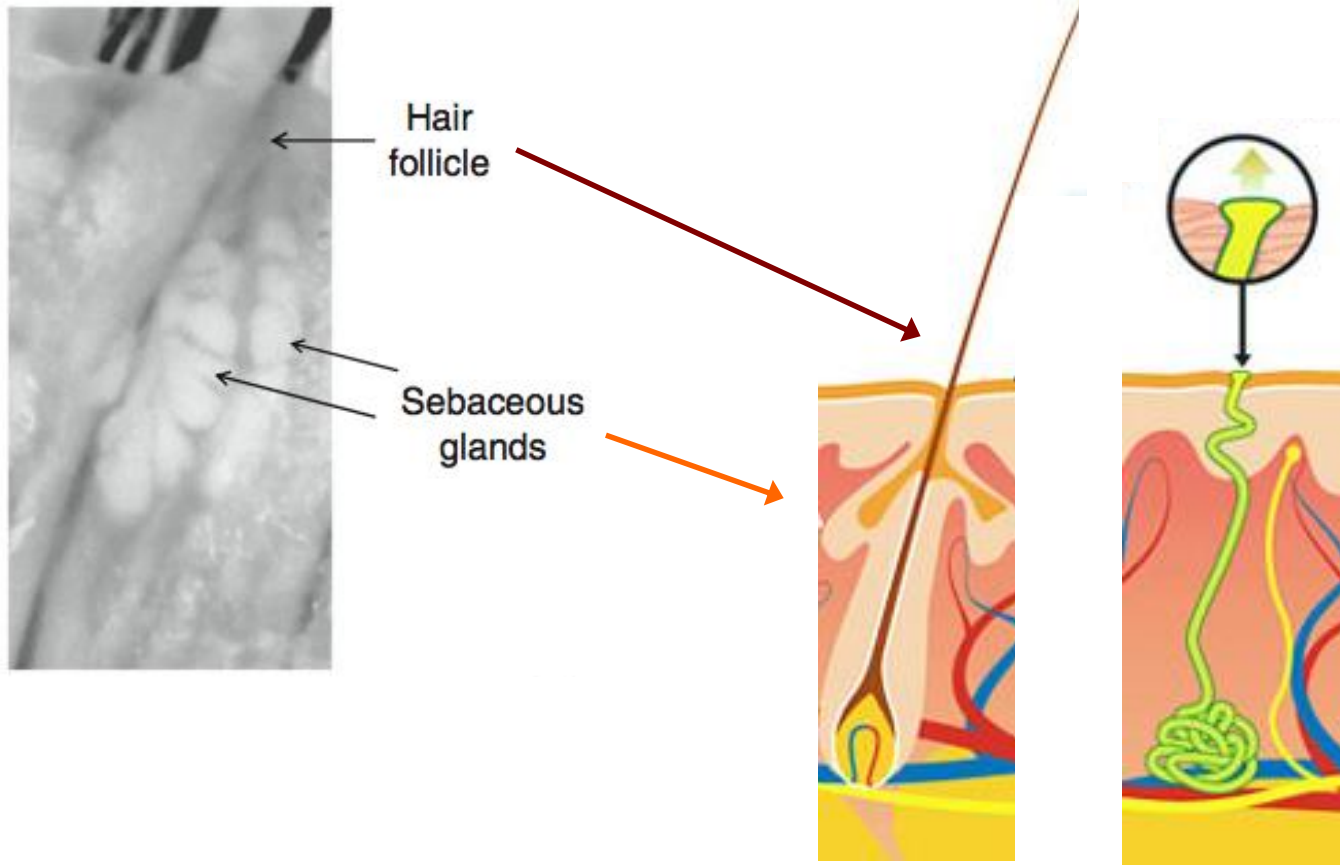


Getty Images



B. Braun | Sharing Expertise.

# Lipids keep moisture in



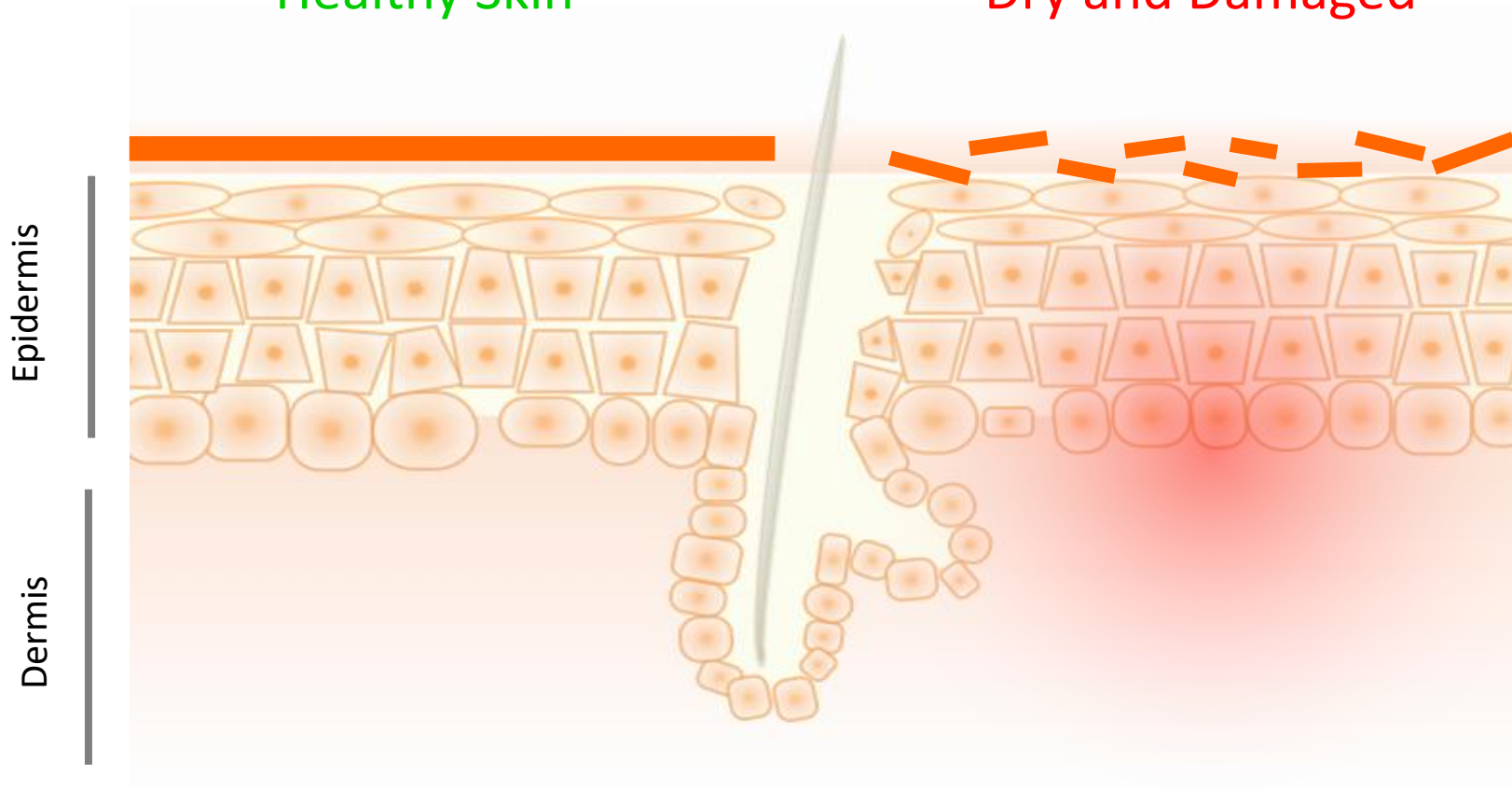
B. Braun | Sharing Expertise.



# Lipids coat the surface of our skin

Healthy Skin

Dry and Damaged



# What are skin lipids anyway?

*triglycerides*

*wax esters*



*ceramides*

*fatty acids*



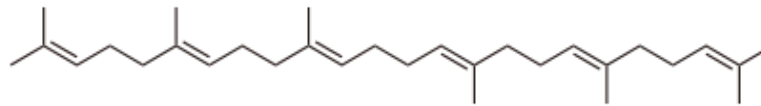
*cholesterol*

*oils*

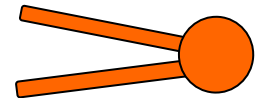
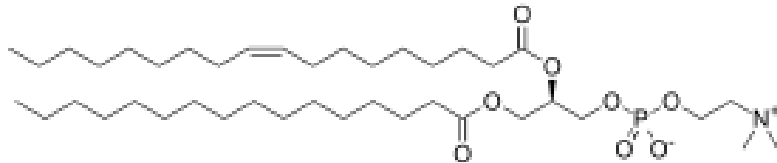


# What are skin lipids anyway?

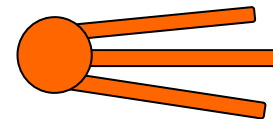
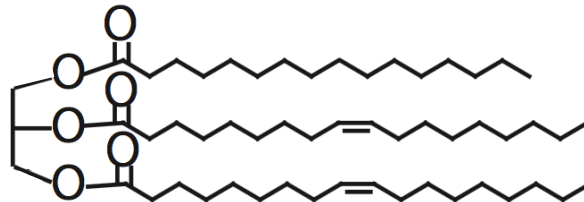
Squalene



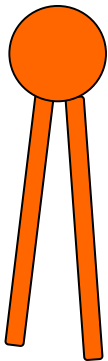
Phosphatidylcholine



Triacylglycerol



Head



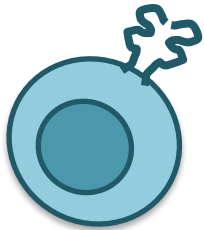
Fatty Acid Tails

Questions?

# Roadmap



1. What does skin do?

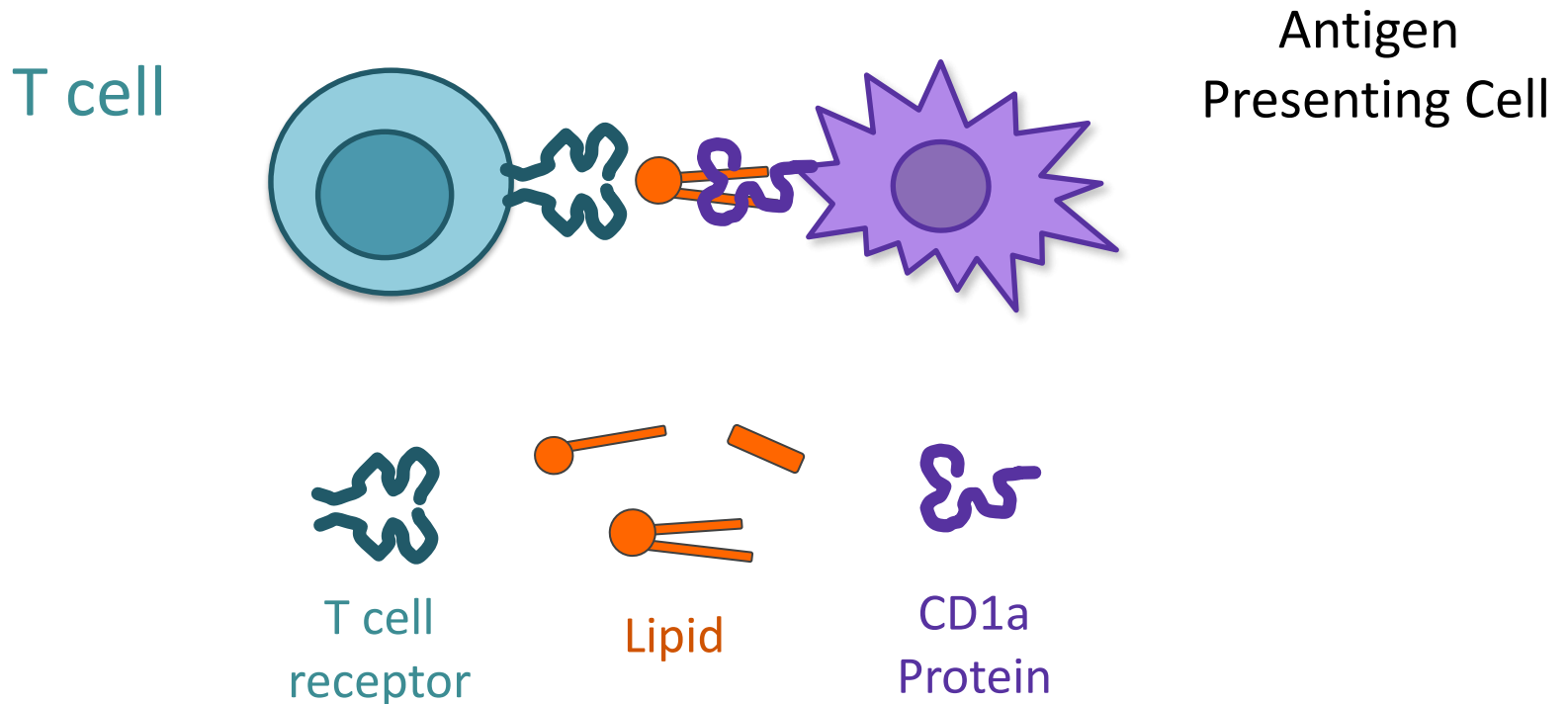


1. Skin lipids and skin immunity

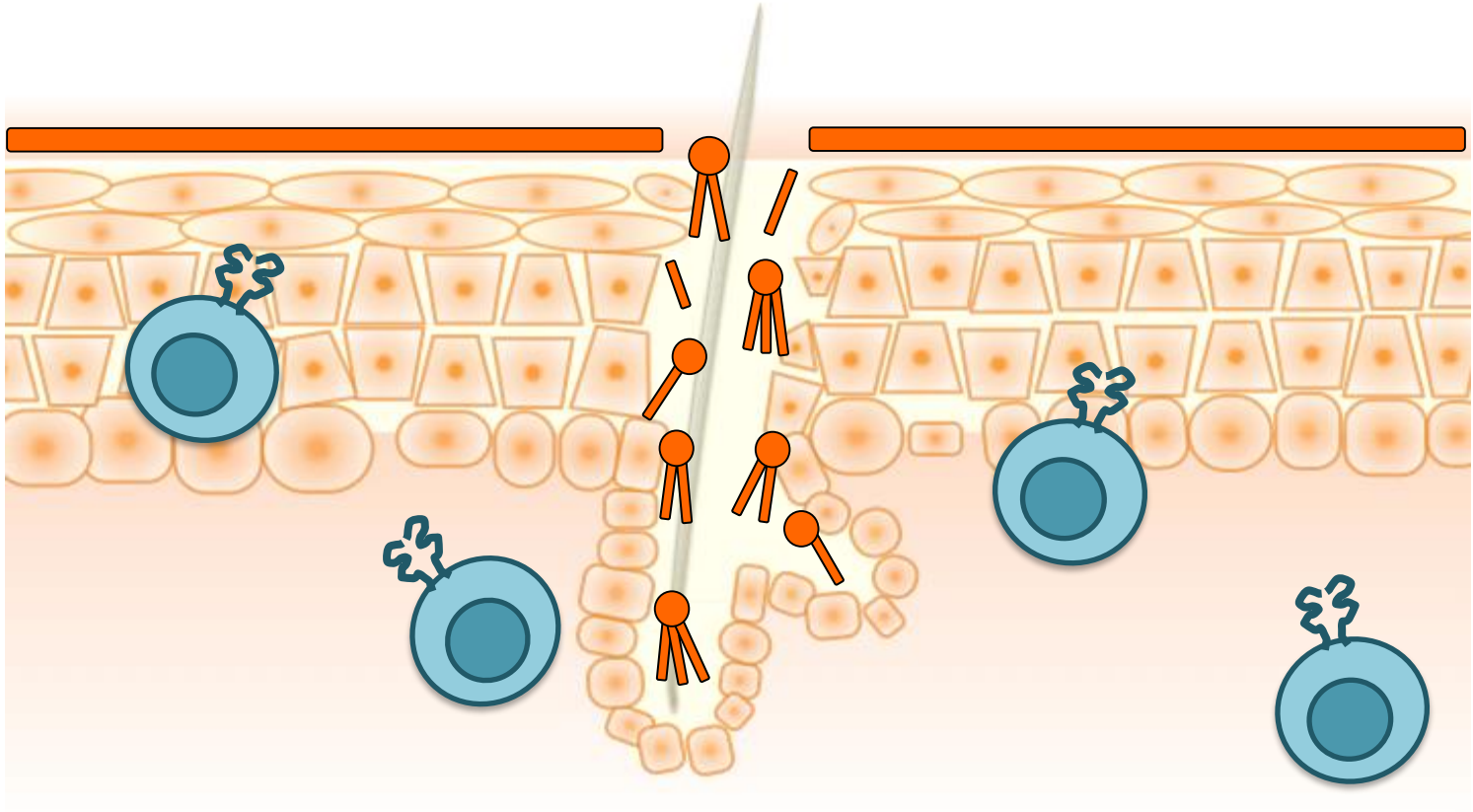


2. How bee venom stirs up a buzz

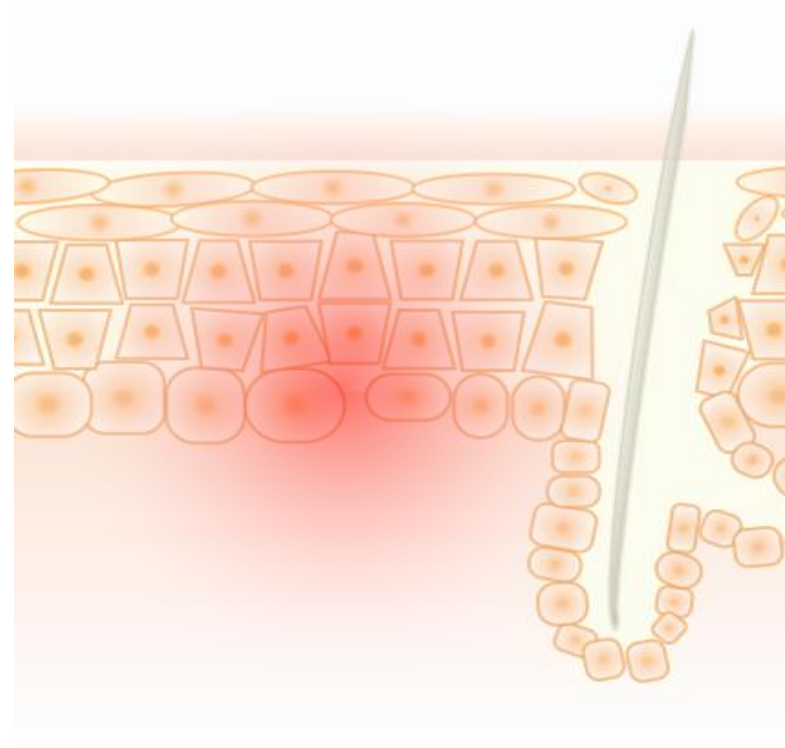
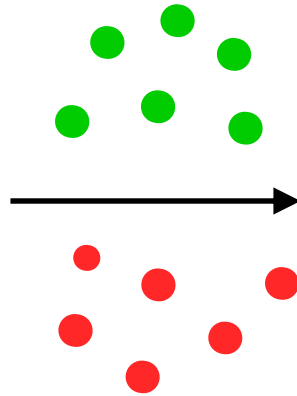
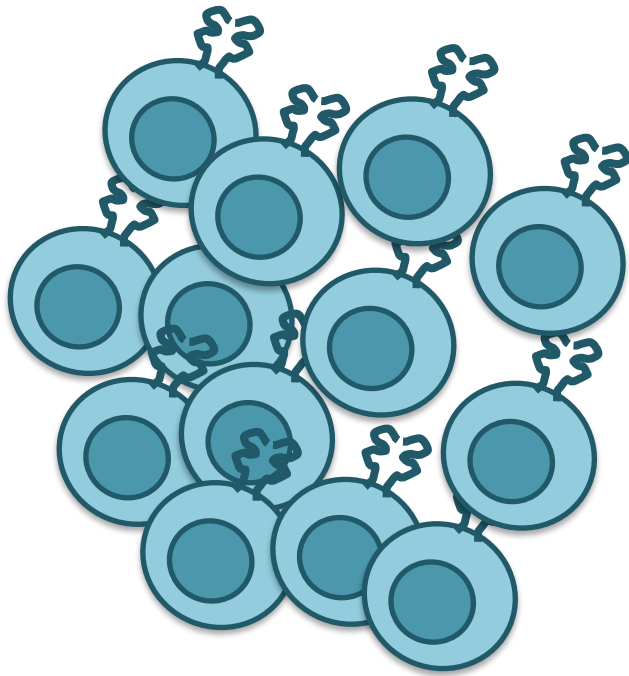
# T cells are immune cells that recognize lipids and protein



# There are 20 billion T cells in your skin



# When a T cell gets activated, it does 2 things:



1. Makes A LOT more of itself

2. Sends a message to tell other cells what to do

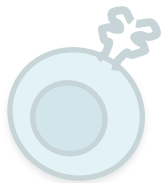


Questions?

# Roadmap



1. What does skin do?

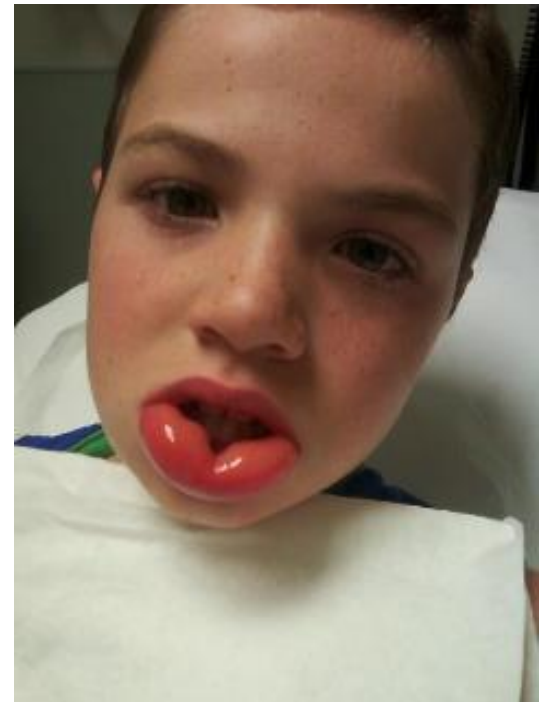


1. Skin lipids and skin immunity

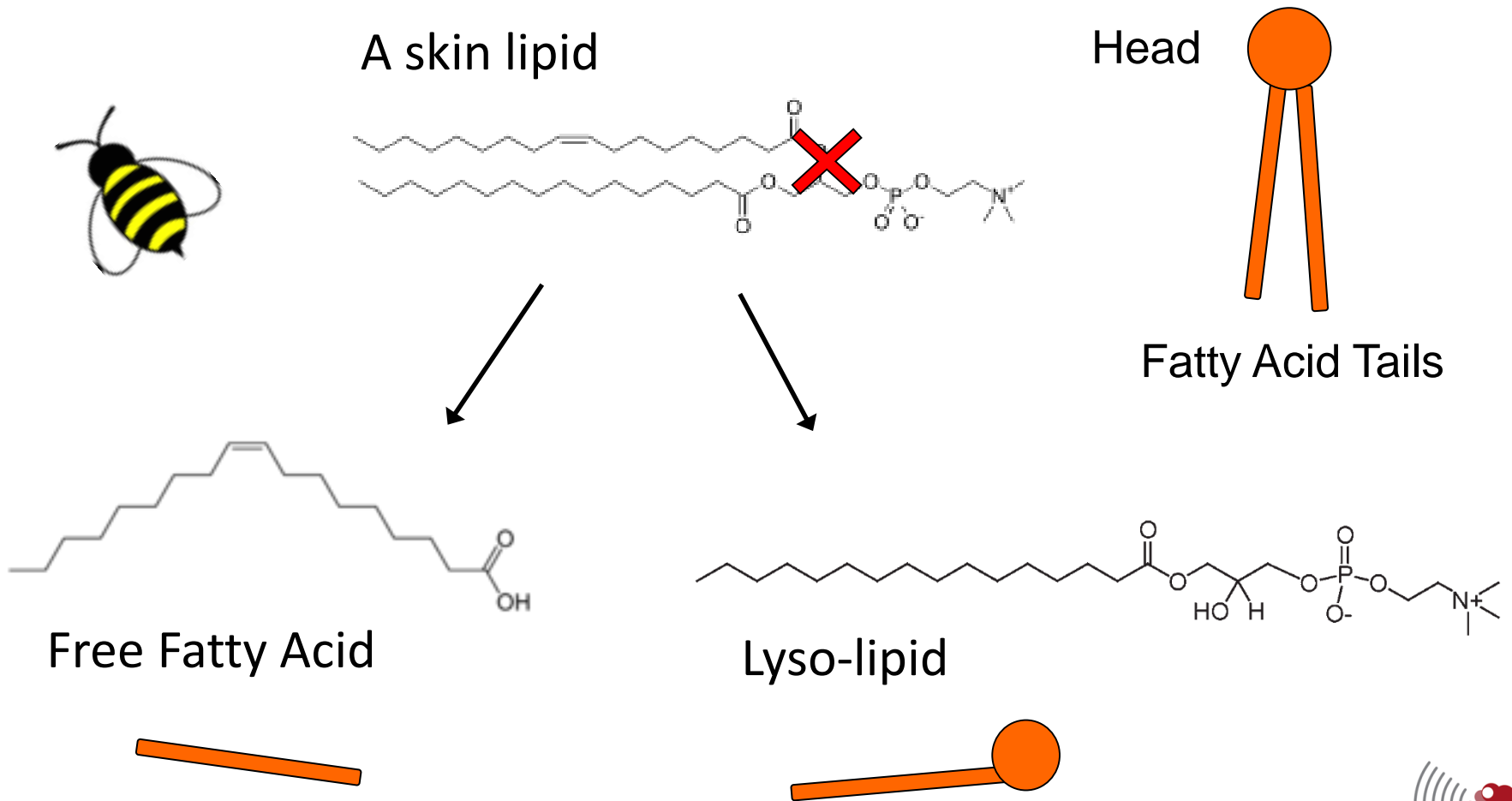


2. How bee venom stirs up a buzz

# Immunology of a Bee Sting



# Bee venom cuts skin lipids into pieces



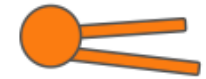
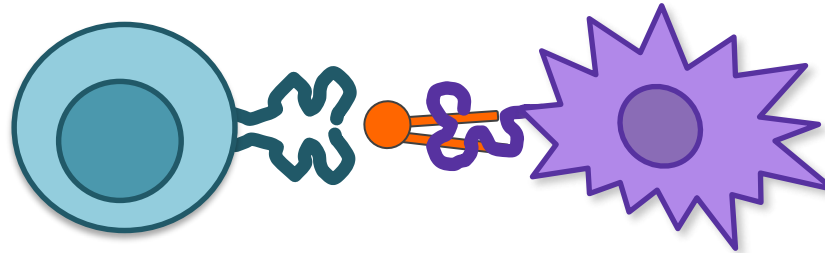
Activation

T cell

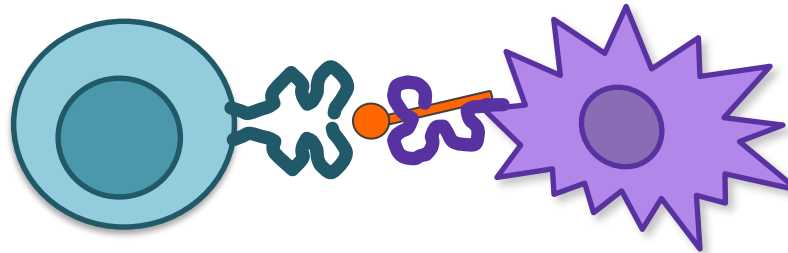
Antigen  
Presenting Cell

Lipid

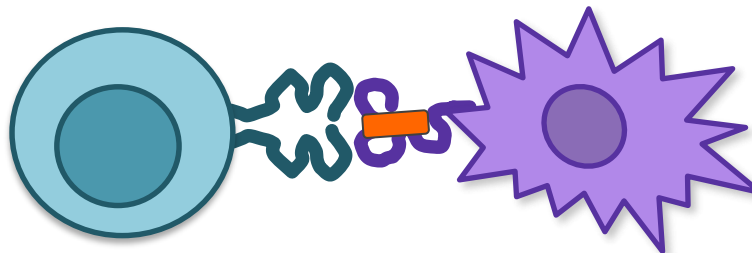
Weak



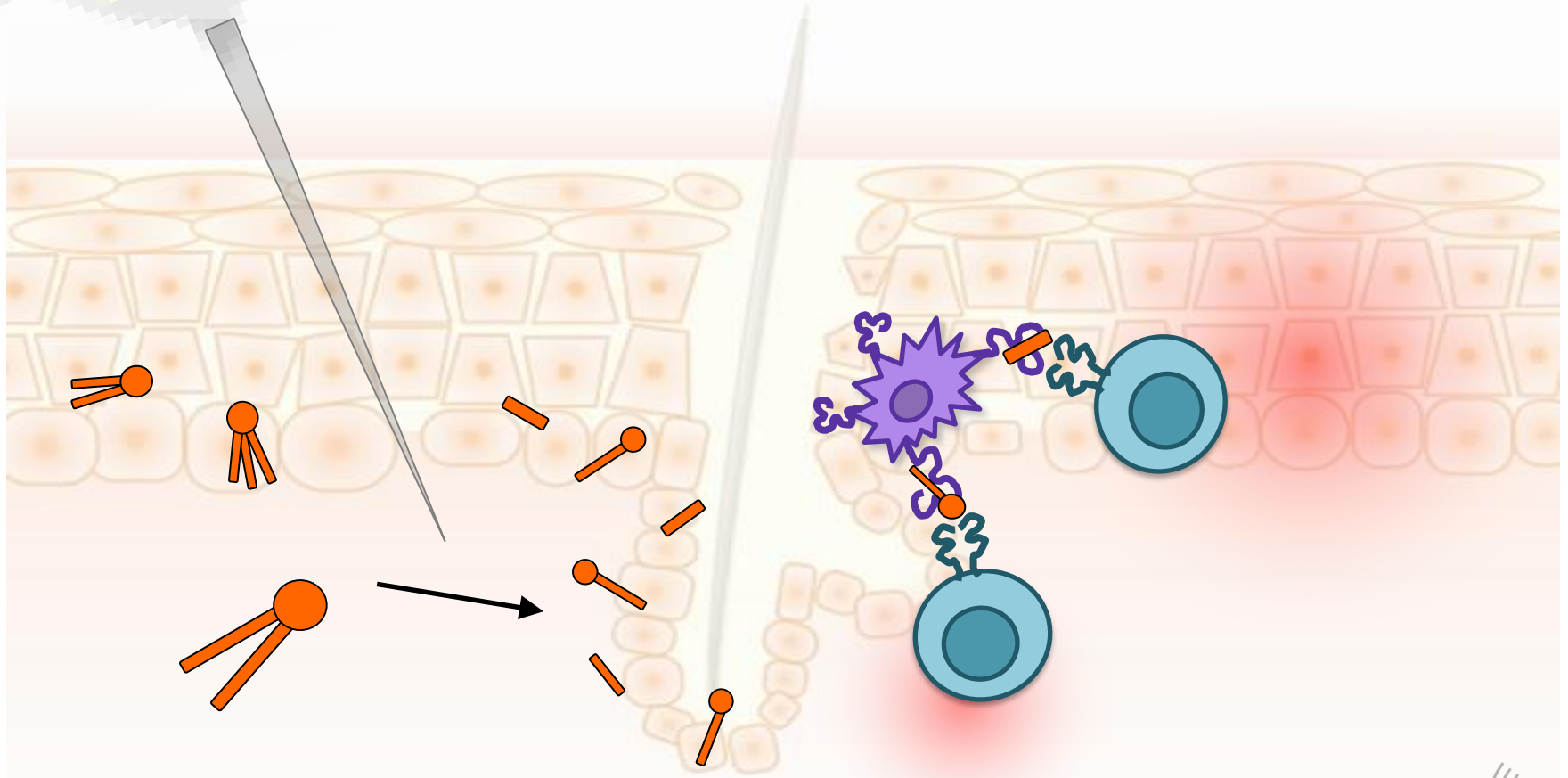
Stronger



Strongest!



Bee venom activates skin T cells by increasing the lipids that strongly activate them





# Bodies in Motion

Our skin is pretty active too!



# Thank you!

*SITN would like to acknowledge the following organizations for their generous support.*

## **Harvard Medical School**

Office of Communications and External Relations  
Division of Medical Sciences

## **The Harvard Graduate School of Arts and Sciences (GSAS)**

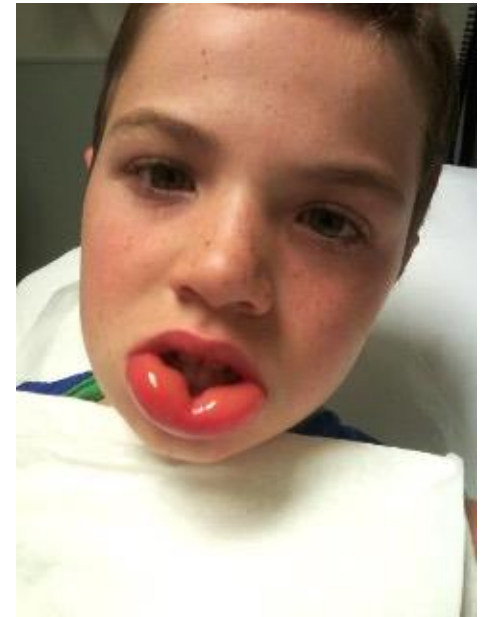
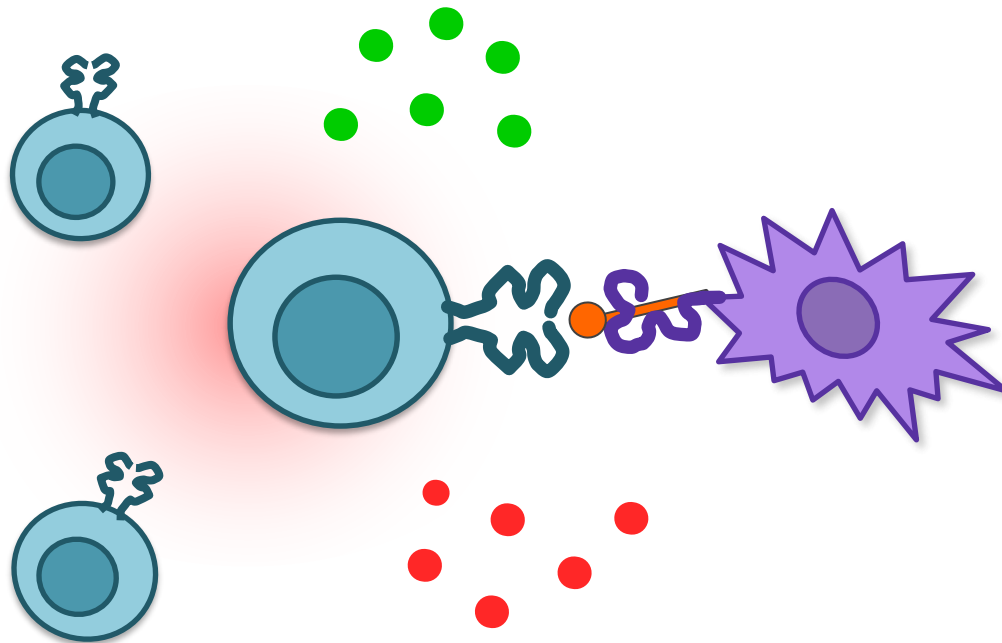
## **The Harvard Graduate Student Council (GSC)**

## **The Harvard Biomedical Graduate Students Organization (BGSO)**

## **The Harvard/MIT COOP**



People allergic to bee stings have *more* of these cells



# These cells stop acting like T cells after allergy treatments

