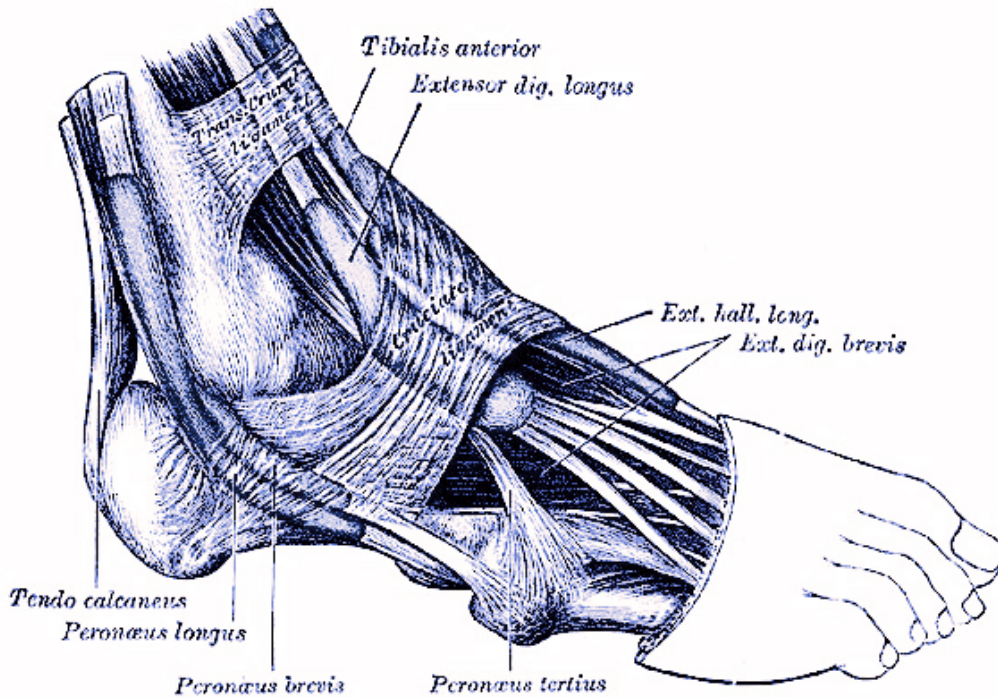


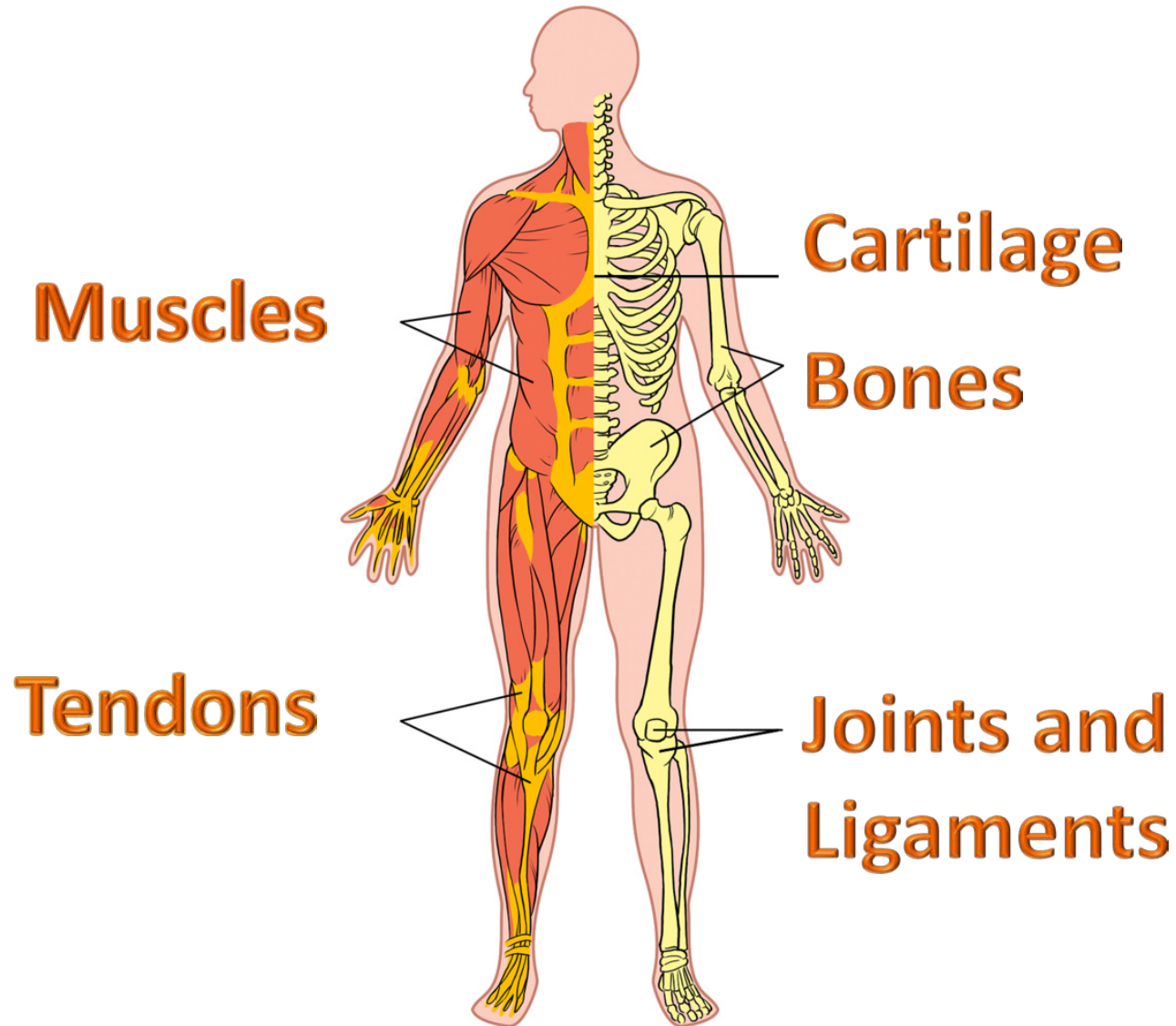
Introducing the
MUSCULOSKELETAL
System



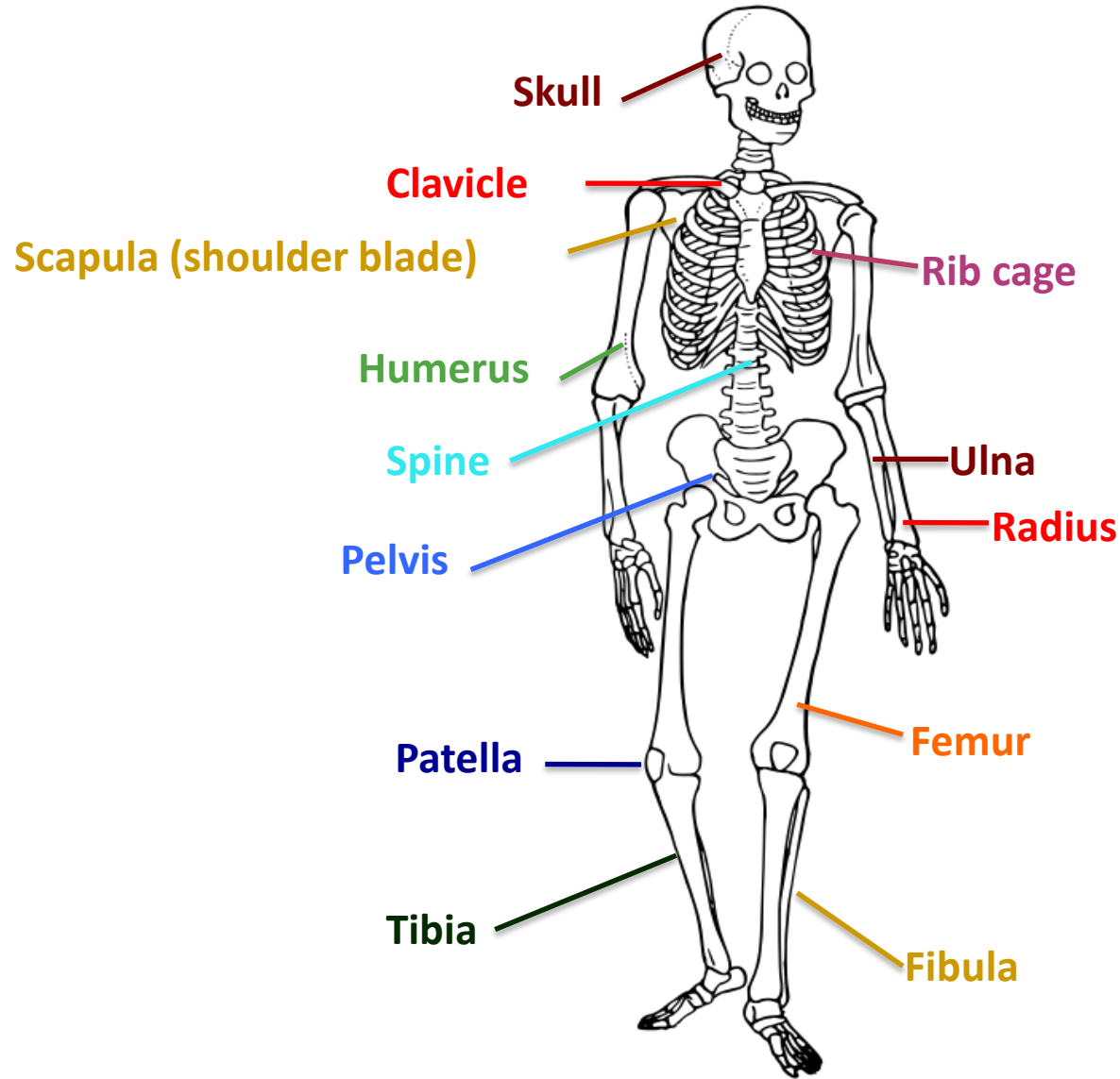
Any questions for a scientist?
Ask your parents to email us!
sarah.gundy@nuigalway.ie

Today **YOU** can use
biomaterials to fix a broken
tendon!

Musculoskeletal System



Bones-Human Skeleton



How many bones do you have?

You have:

300 bones at
birth

206 bones by
adulthood



Where do they
go?



Bones-Functions

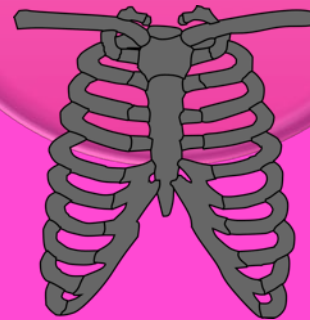
Give
structure &
support



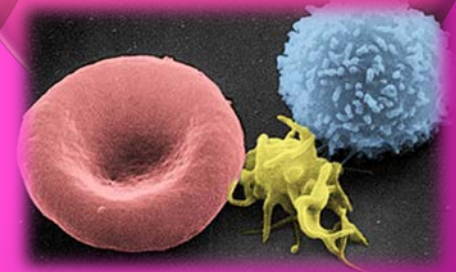
Movement



Protect vital
organs



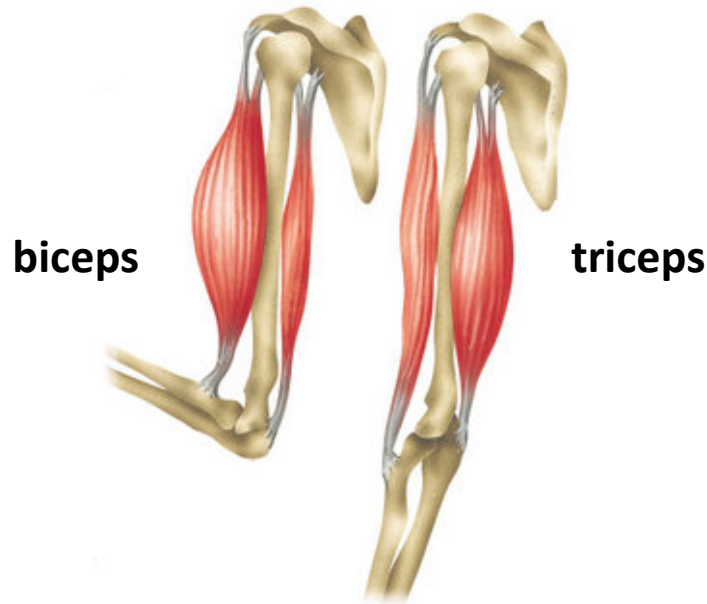
Make blood
cells



Bones are unable to move by themselves

Flexion

Muscles tend to occur in pairs, i.e. work in opposition



Extension

Muscles move bones by shortening, i.e. contracting

Muscles can only "pull" and do not "push" bones

As you bend your elbow
and raise your hand
slowly which muscle is
contracting?

Biceps or triceps?



Tendons-Connect Bones to Muscles



Do you have this tendon in your wrist?

Most people have it

14% of people do not have it

Was used years ago to flex the wrist

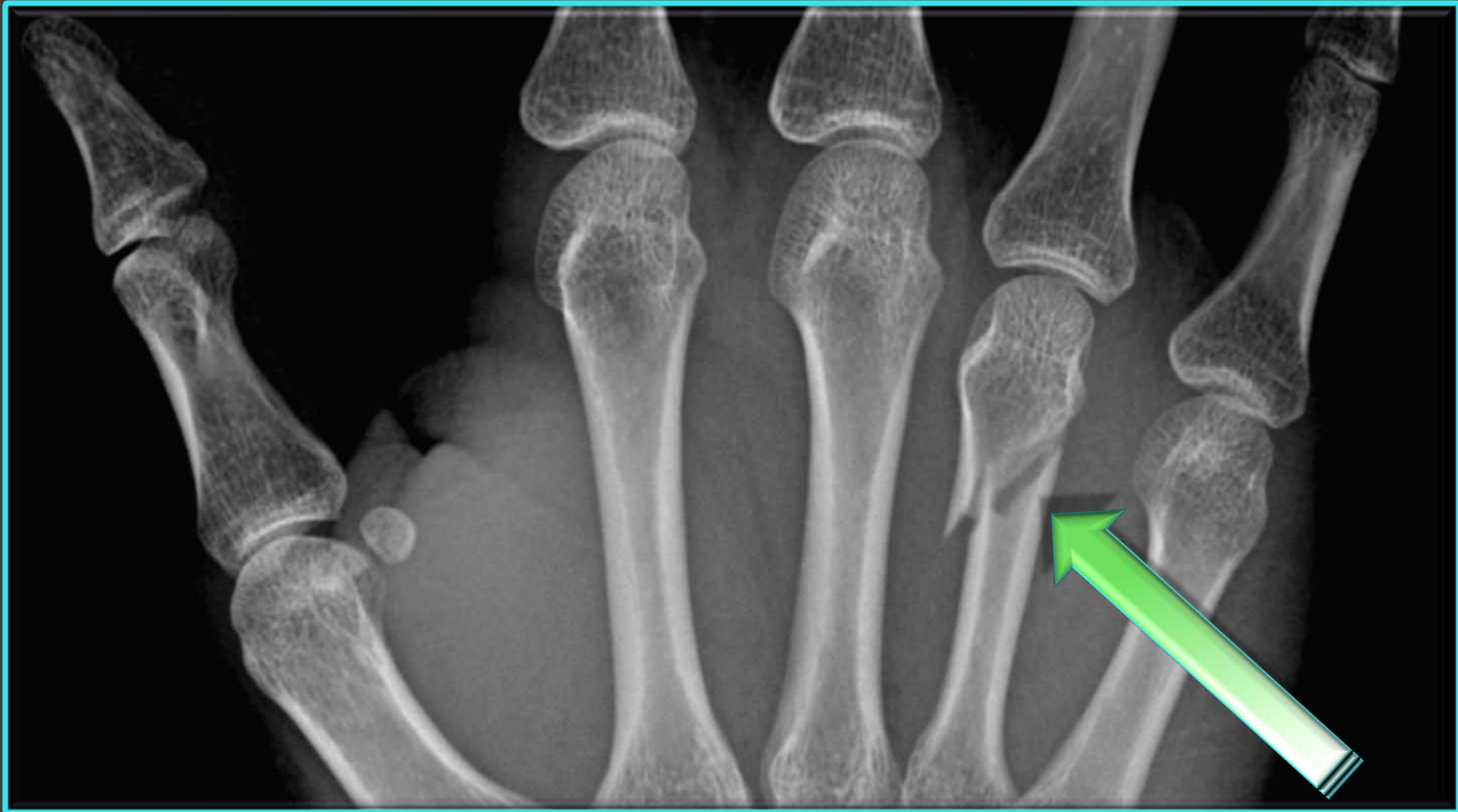
Not needed anymore and can be removed

Can be used to replace damaged tendons

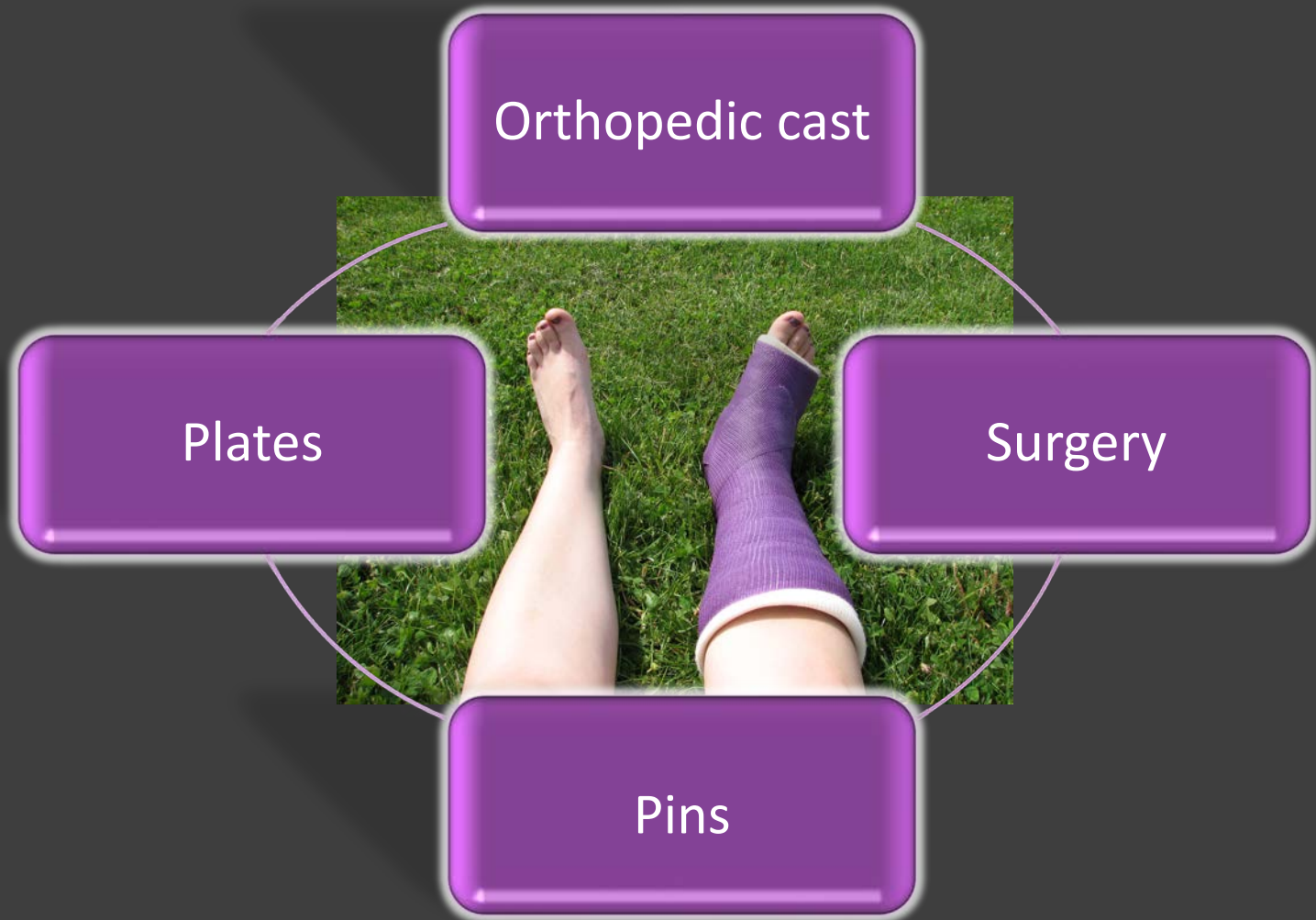


Palmaris Longus

Broken Bones

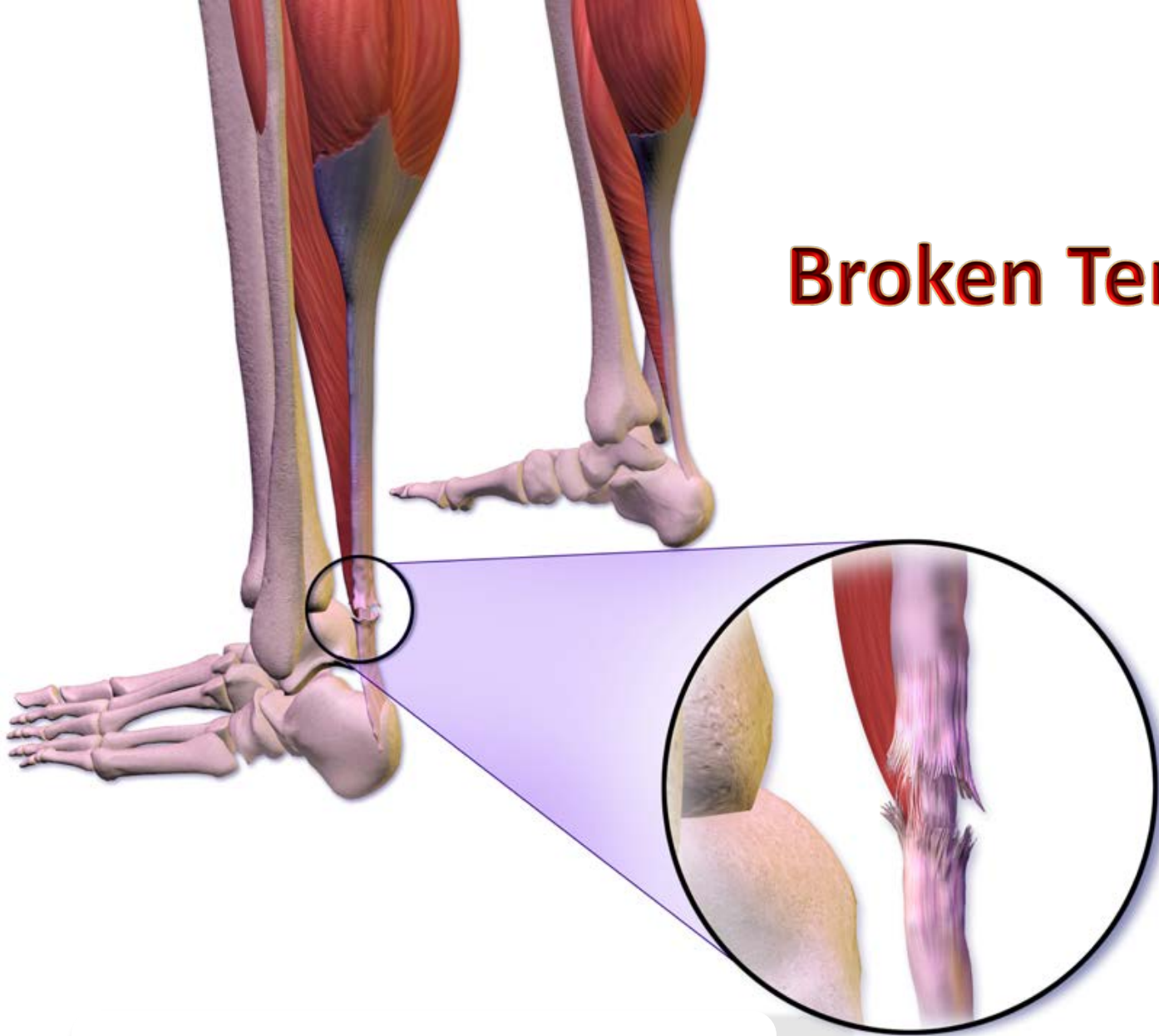


Broken Bones-Treatment





Broken Tendons



Achilles Tendon Tear

Biomedical Engineering



Engineering and medicine coming together to help improve people's health

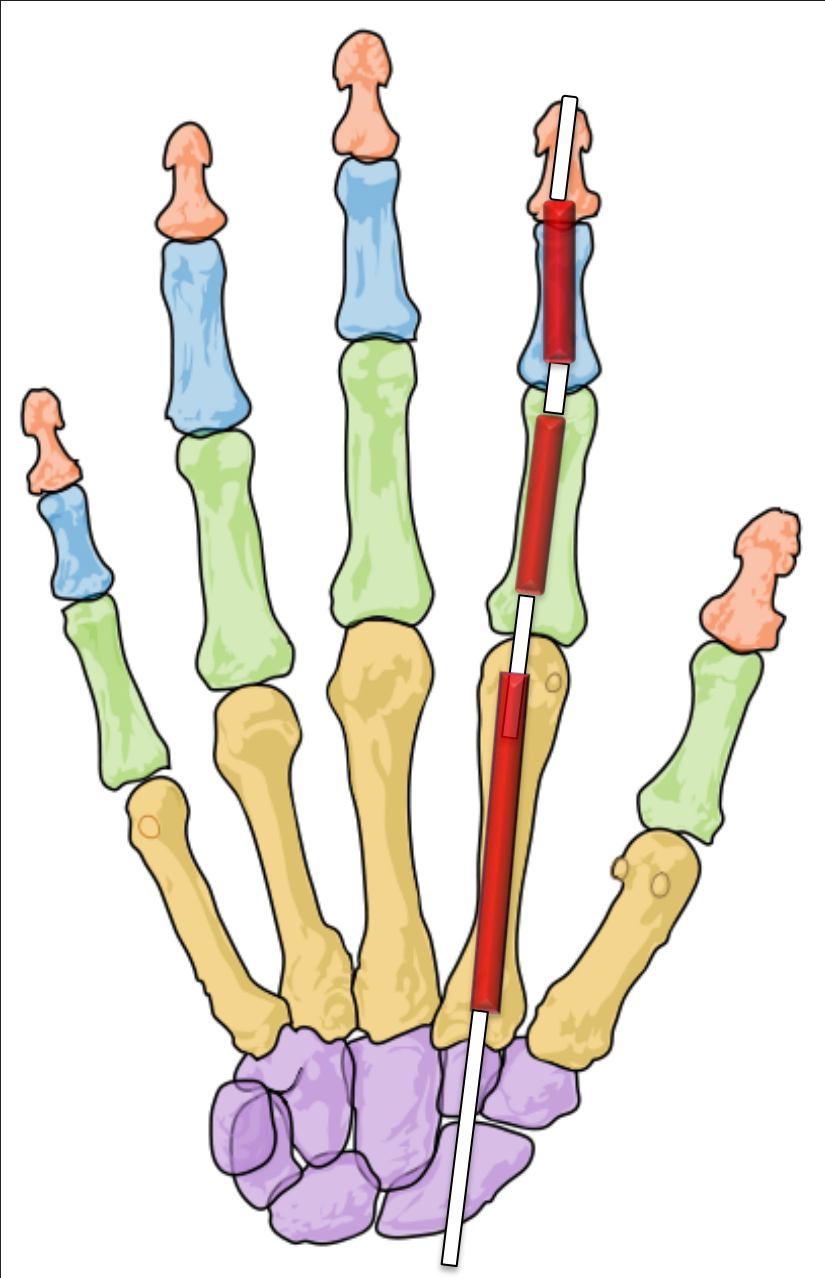


Today **you** will be a Biomedical Engineer to repair a damaged tendon!

Step 1- Make a finger

Straws (Bones)

String (Tendons)



The finger gets 3 straws that act as bones

The finger gets 1 string that acts as the tendons

Make sure you leave a big space between the straws!

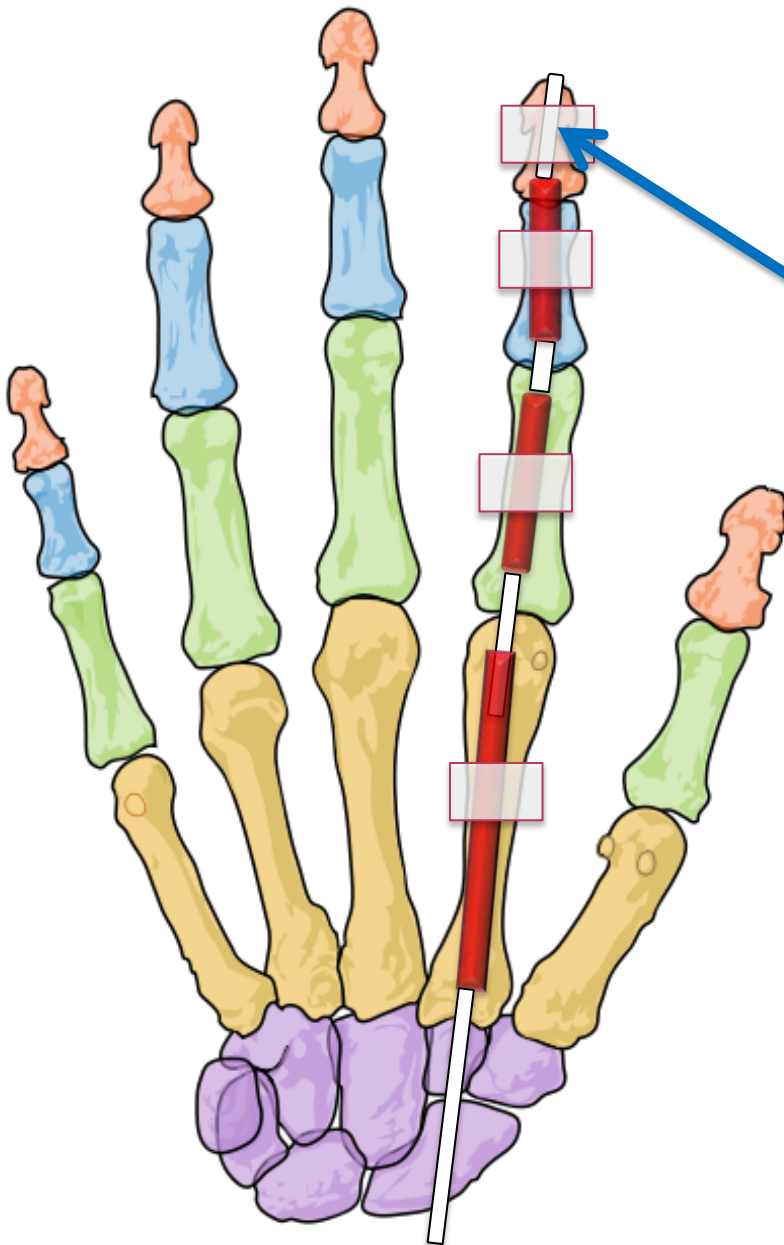
Step 1- Make a finger

Tape the string to the
tip of the finger here

Tape the 3 straws to the paper

Do not tape the string!

Bend the paper between the
straws for the finger to move
easier

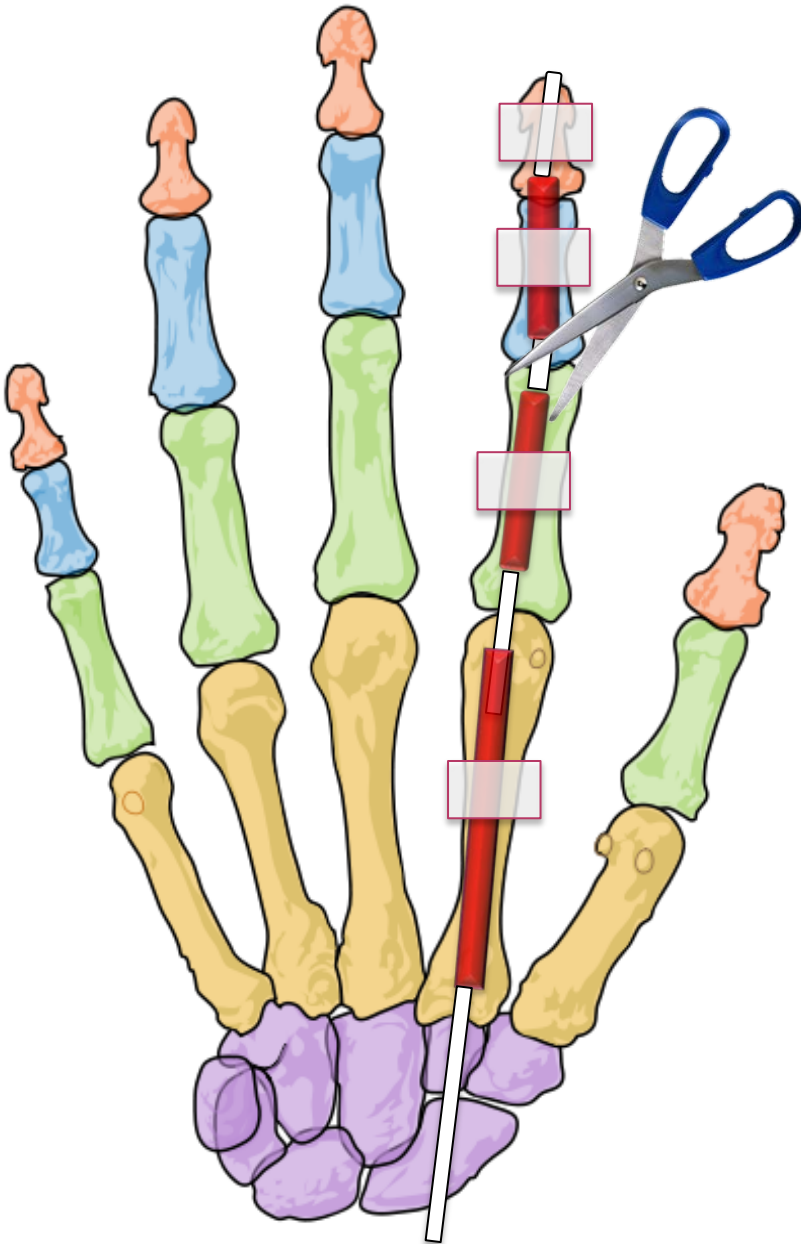




Step 2- Damage and repair tendon

Use your scissors to cut the string
between two straws

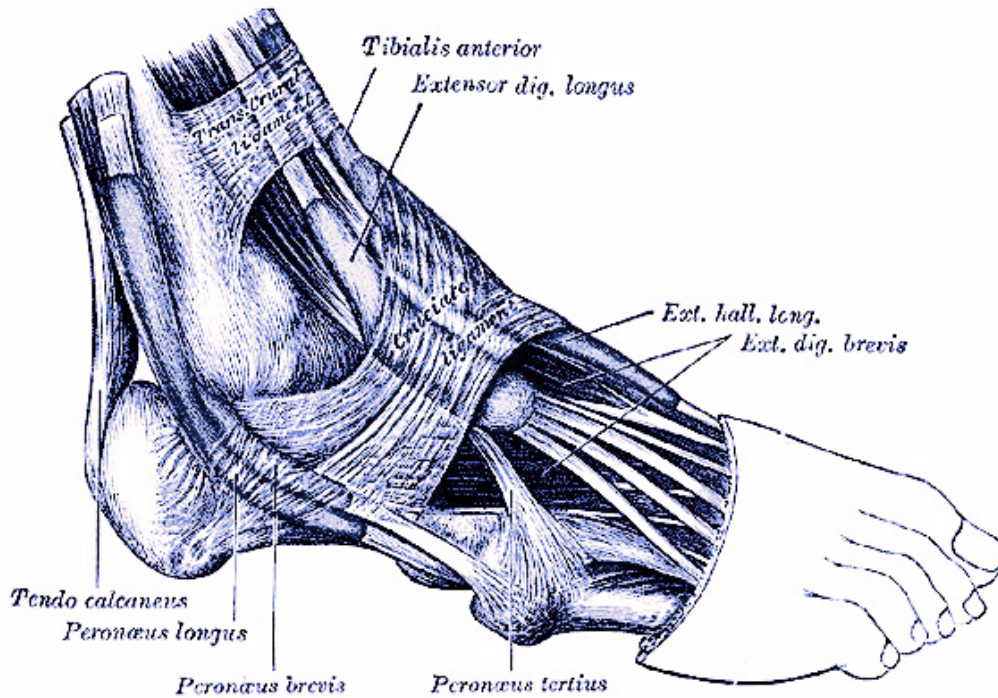
Repair your “tendon” using the
“biomaterials” in your house



HOW DID YOU DO?

Do you think you fixed your tendon? Why or why not?

If you were fixing the tendon again, what would you do differently?



**Send us a photo of your
tendons and biomaterials!**

**Any questions for a scientist?
Ask your parents to email us!
sarah.gundy@nuigalway.ie**

References:

1. commons.wikimedia.org
2. www.flickr.com
3. Gray's Anatomy

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