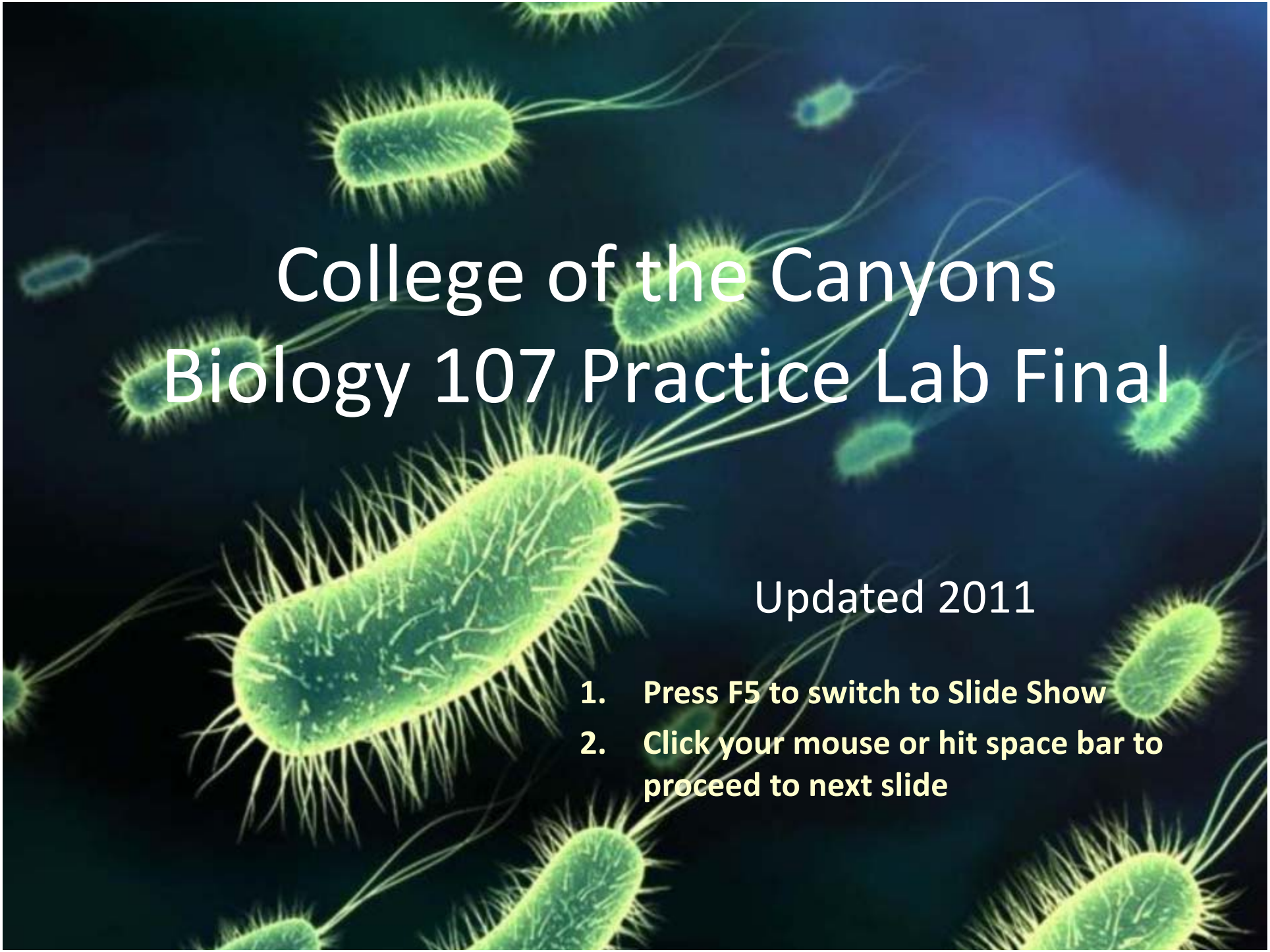


College of the Canyons
Biology 107 Practice Lab Final

Updated 2011

1. **Press F5 to switch to Slide Show**
2. **Click your mouse or hit space bar to proceed to next slide**

Metric Practice

Metric System Help Sheet

Prefix	Symbol	Power	Number	Equivalent
Giga-	G	10^{9}	1,000,000,000	Billion
Mega-	M	10^{6}	1,000,000	Million
kilo-	k	10^{3}	1,000	Thousand
hecto-	h	10^{2}	100	Hundred
deka-	dk	10^{1}	10	Ten
Base Unit		10^{0}	1	One
deci-	d	10^{-1}	0.1 (1/10)	Tenth
centi-	c	10^{-2}	0.01 (1/100)	Hundredth
milli-	m	10^{-3}	0.001 (1/1000)	Thousandth
micro-	μ	10^{-6}	0.000001 (1/1,000,000)	Millionth
nano-	n	10^{-9}	0.000000001 (1/1,000,000,000)	Billionth

The metric system is a base 10 system, that is you can change between units by multiplying and dividing by powers of ten.

For example:

$1\ km = 1000\ m = 10^3\ m$

$1\ mg = \frac{1}{1{,}000\ {,}000} g = 0.000001\ g = 10^{-6}\ g$

$1\ L = 100\ cL = 10^2\ cL$

Sample Metric Conversion Problems

1 dg = 0.1 g

6 m = 6000 mm

4 mL = 0.4 cL

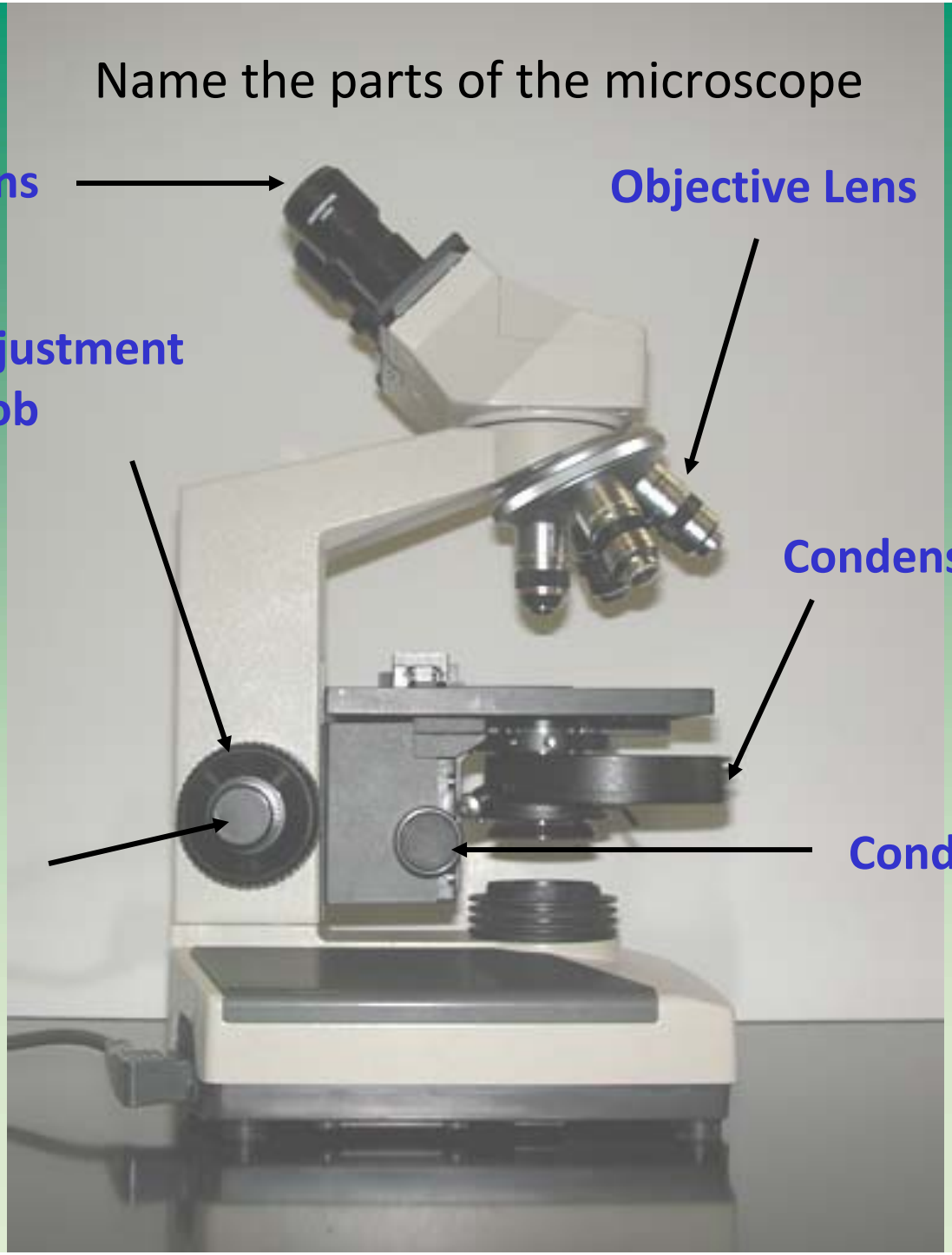
7 g = 0.007 kg

4 nm = 0.000004 mm

3 g = 3,000,000 μg

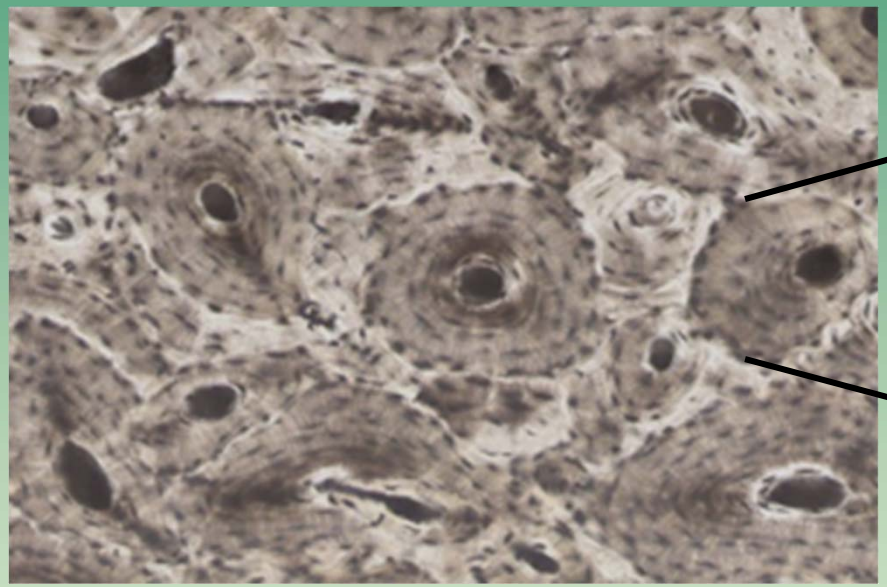
Looking at Life

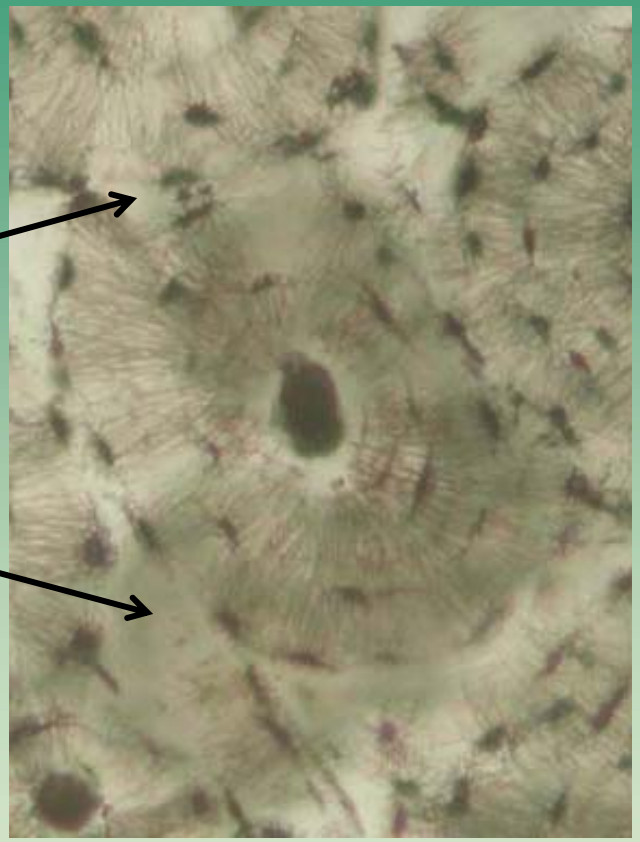
Name the parts of the microscope



Name this tissue

Bone

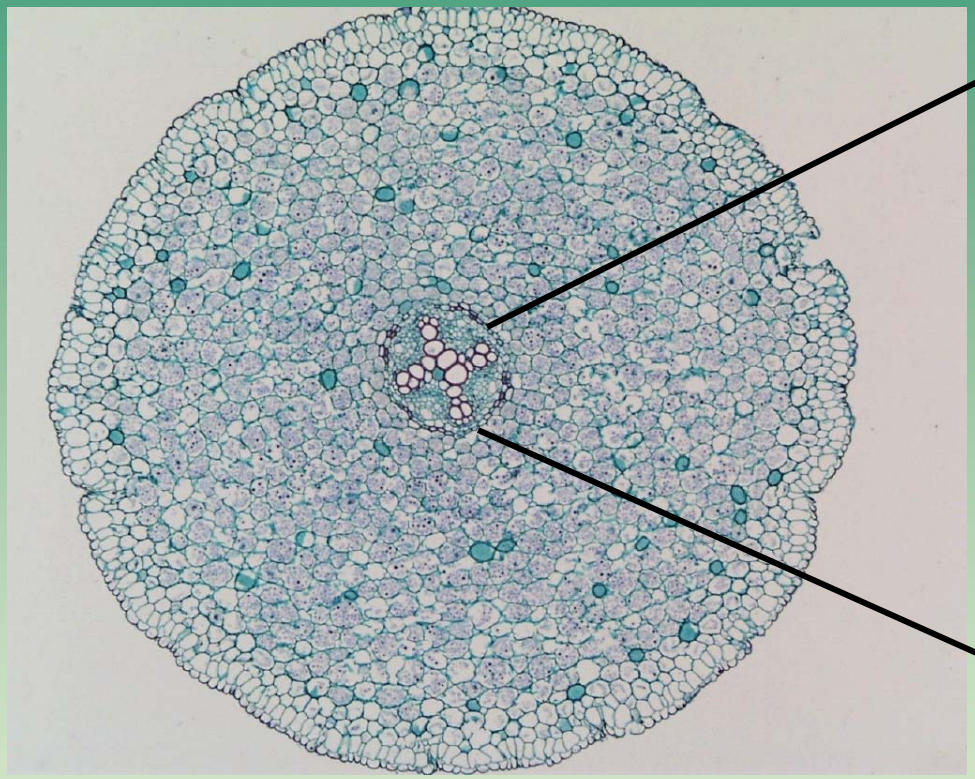




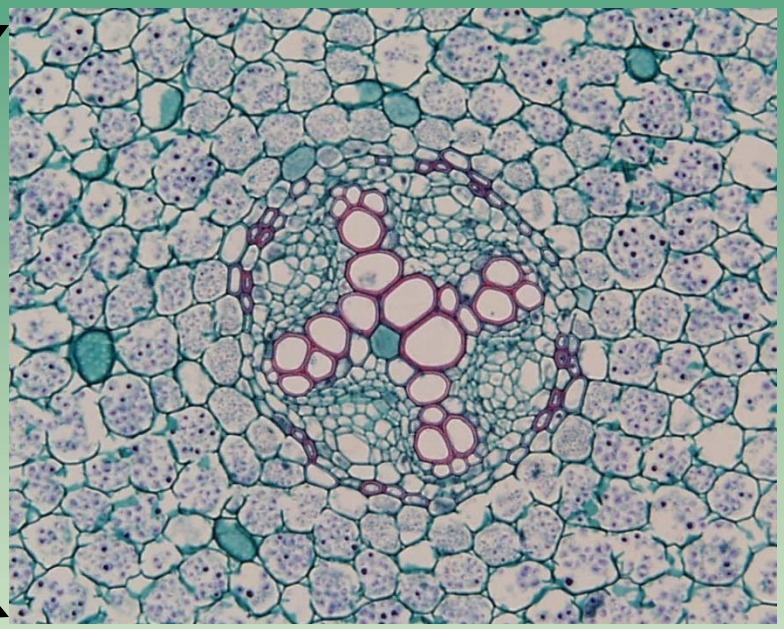
100X

Name this tissue

Ranunculus Root



Complete cross section



Close up

Which of these objectives will have the largest working distance?

The 4X objective (shortest)

What is the total magnification when this microscope is set as shown?

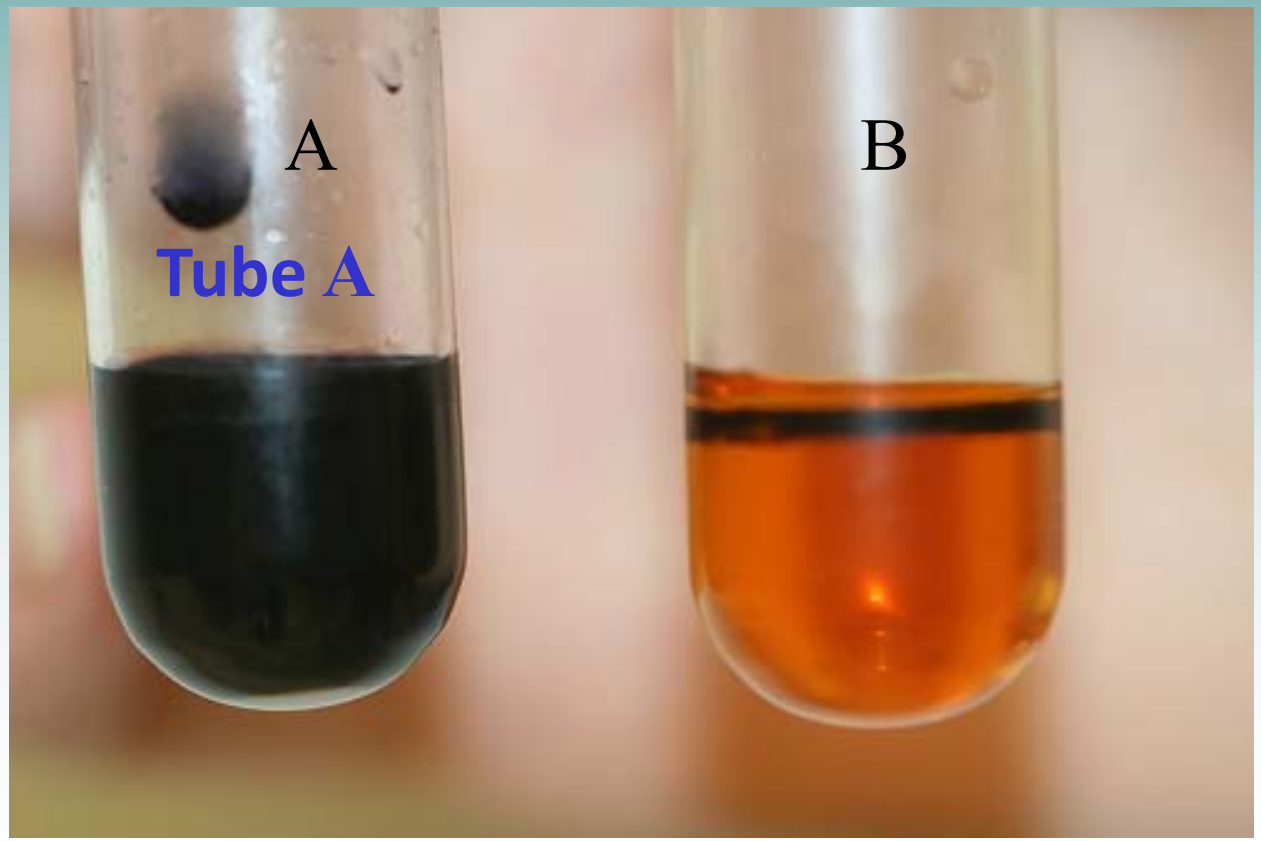
4 (objective) x 10 (ocular) = 40X

Biological Molecules

What molecule is detected by the Iodine Test?

–Detects Starch

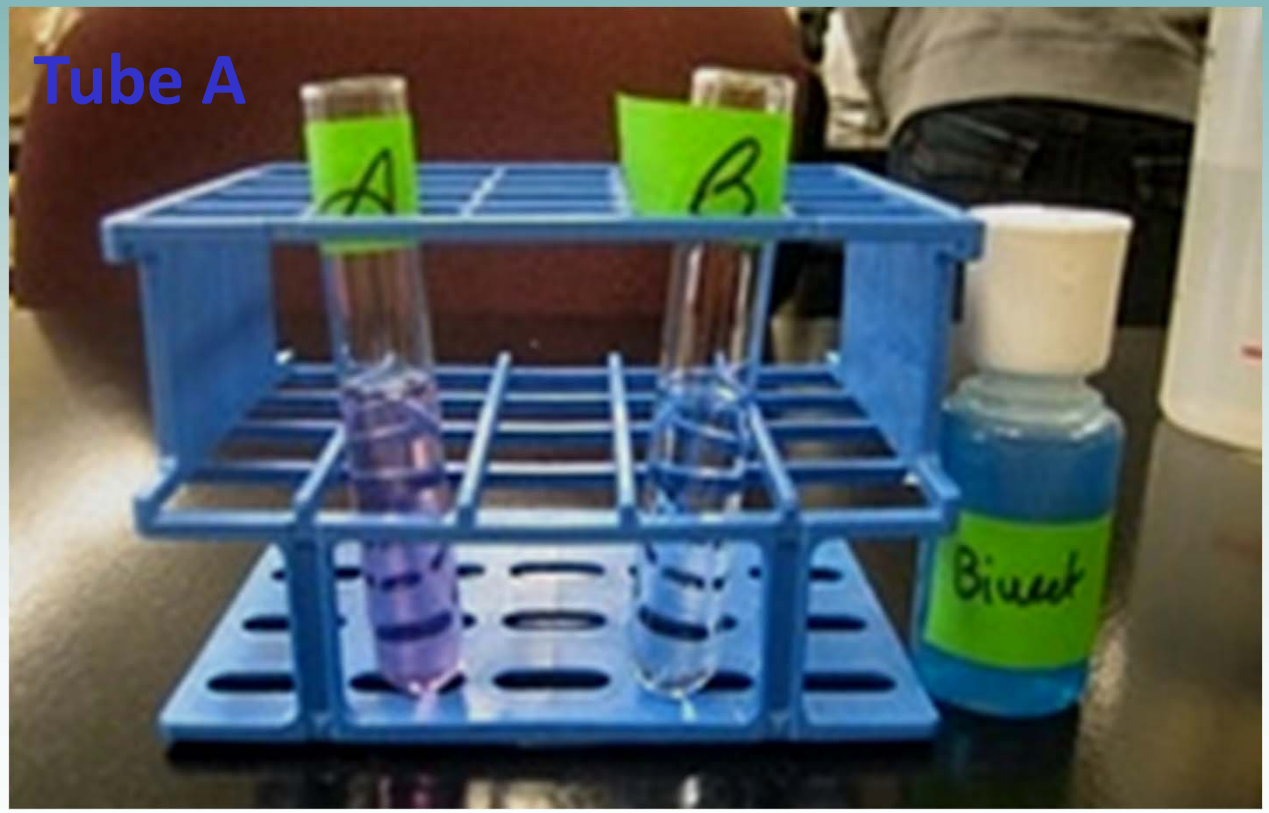
Which tube is positive for the Iodine test?



What molecule is detected by the Biuret Test?

–Detects Protein

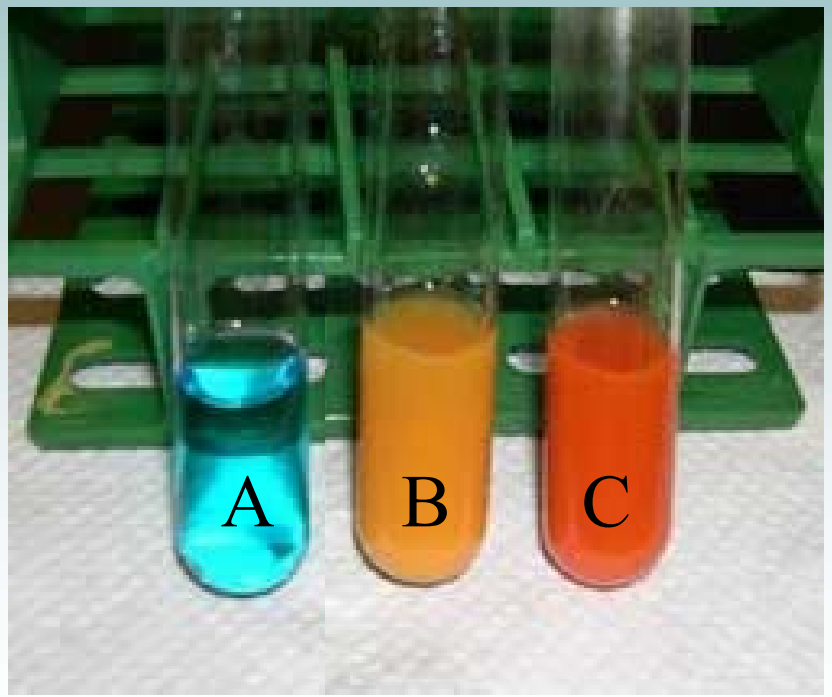
Which tube is positive for the Biruet test?



What does the Benedict's test detect?

Detects Reducing Sugar

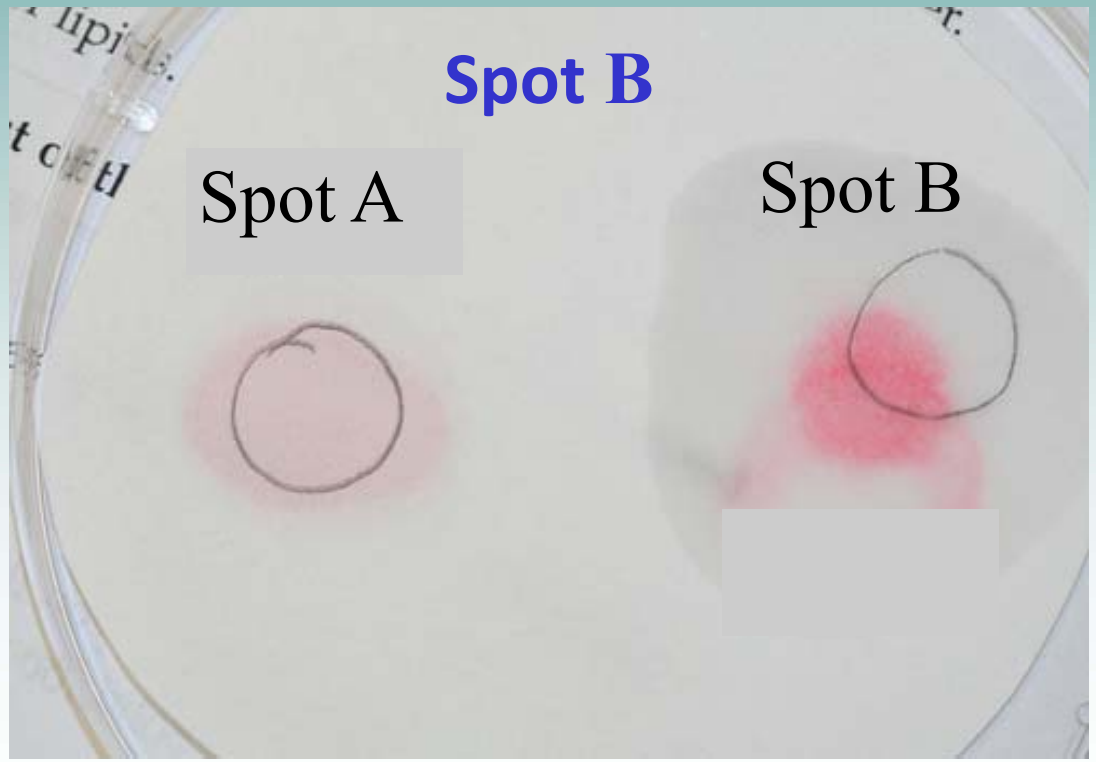
Which of the tubes below is a <u>strong positive</u> for the Benedict's test? **Tube C**



What does the Sudan test detect?

Detects lipids

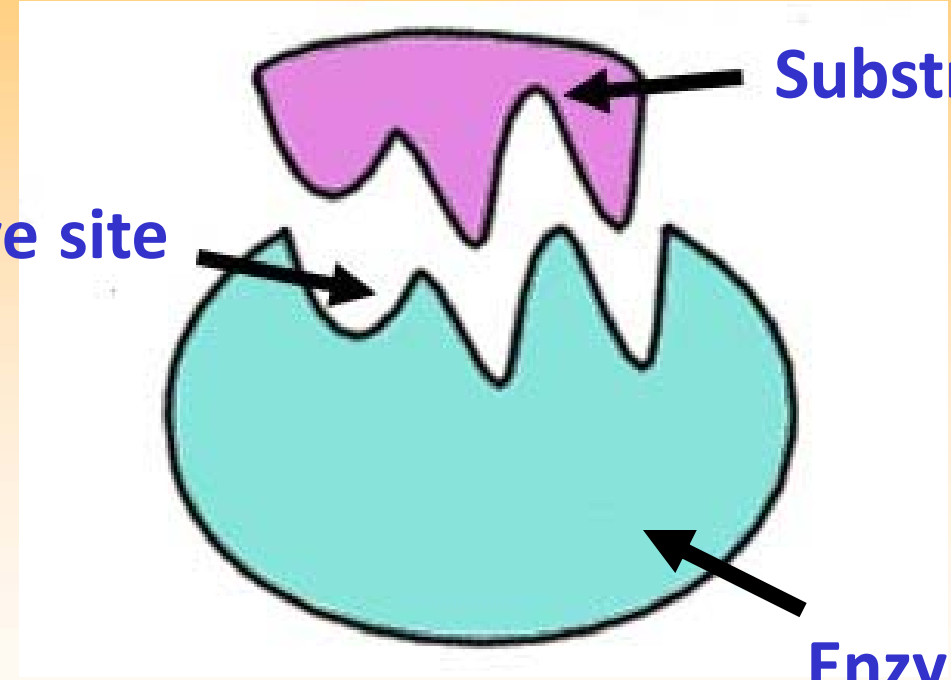
Which spot is positive for the Sudan test?



Enzymes in Action

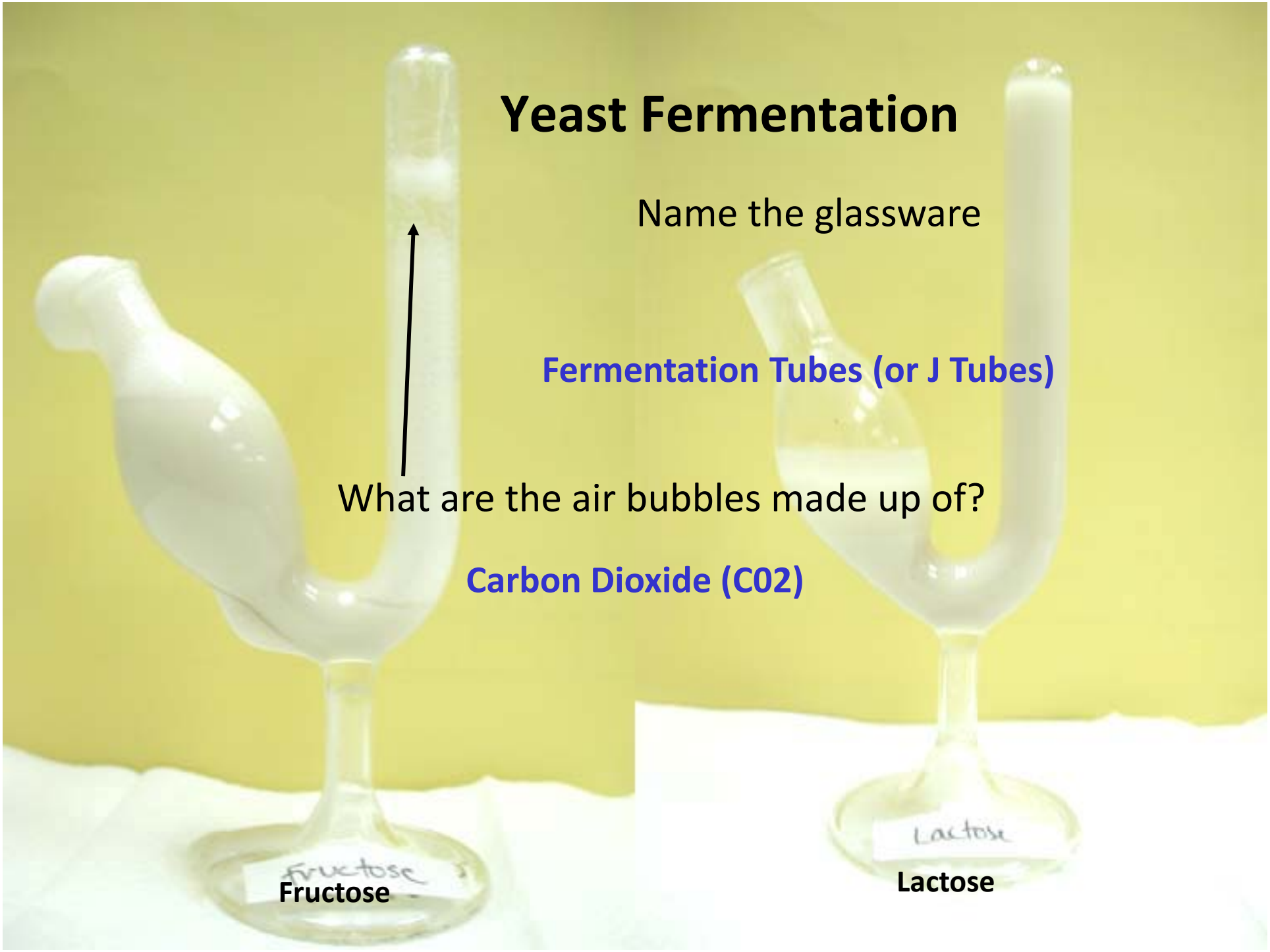
On the diagram below, identify:

–the enzyme –active site –substrate



Complete the following Fermentation Reaction

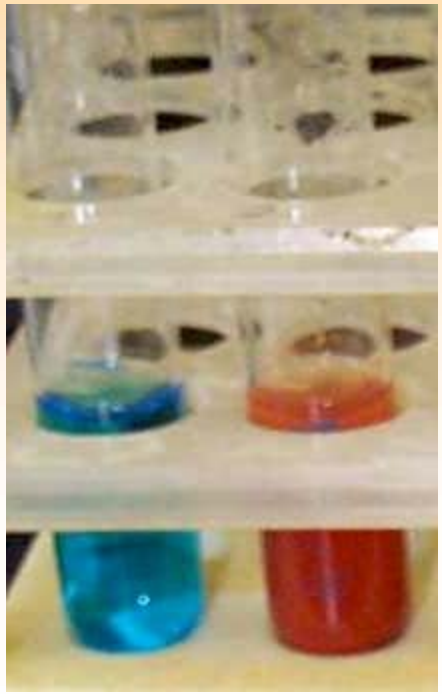
Sugar + enzymes $\longrightarrow$ **CO_2 + Ethanol+ ATP+ heat**


Yeast Fermentation
Name the glassware
Fermentation Tubes (or J Tubes)
What are the air bubbles made up of?
Carbon Dioxide (C02)
Fructose
Lactose
Fructose
Lactose

In the enzyme lab, which enzyme was tested for its ability to cleave sucrose?

Enzyme = Sucrase (or Invertase)

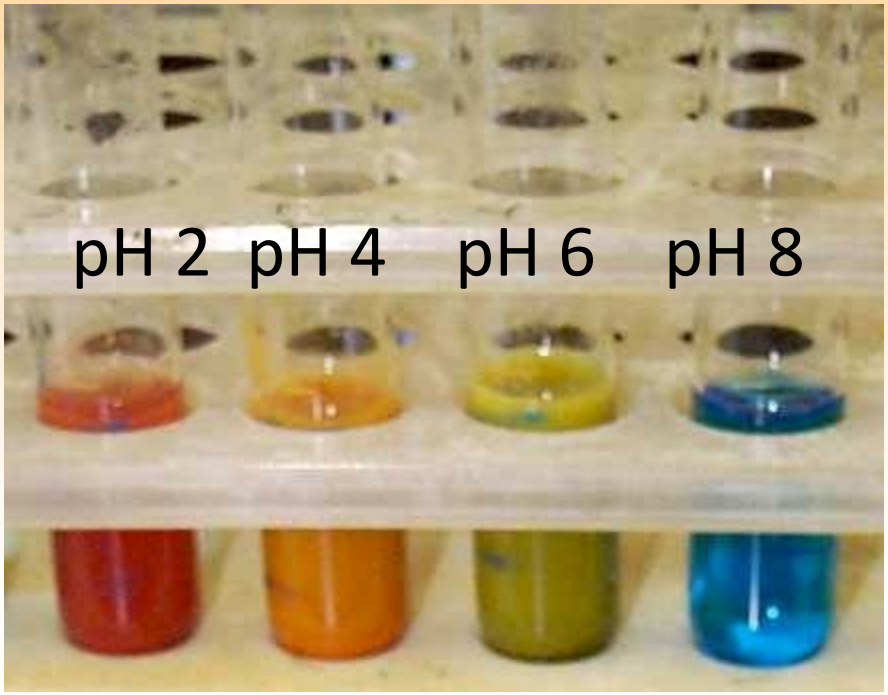
Which biochemical test was used to determine if this enzyme was working?



Test = Benedict's

Below are example results where enzyme samples were mixed with different pH buffers. According to these results, which buffer is optimal for the enzyme?

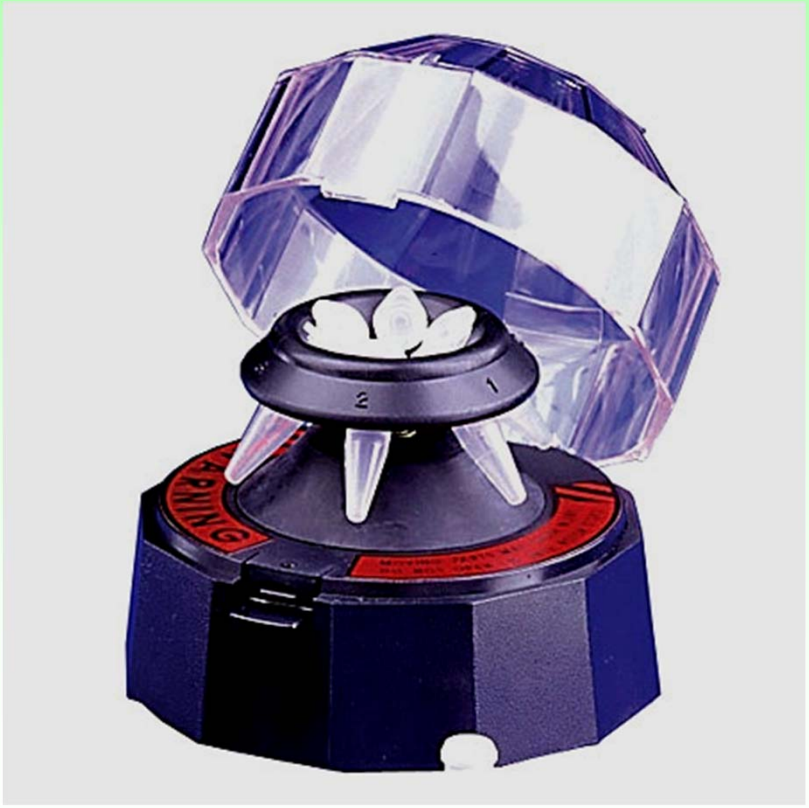
pH 2 (red = most activity)

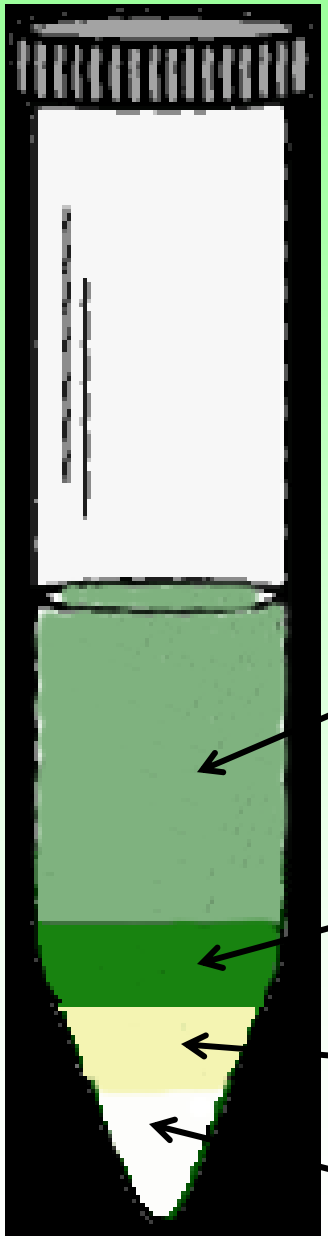


Diffusion/Osmosis
and
Probing the Cell

Name these instruments

Centrifuges





Which organelles are found in the supernatant and colored pellet layers of a centrifuged pea solution?

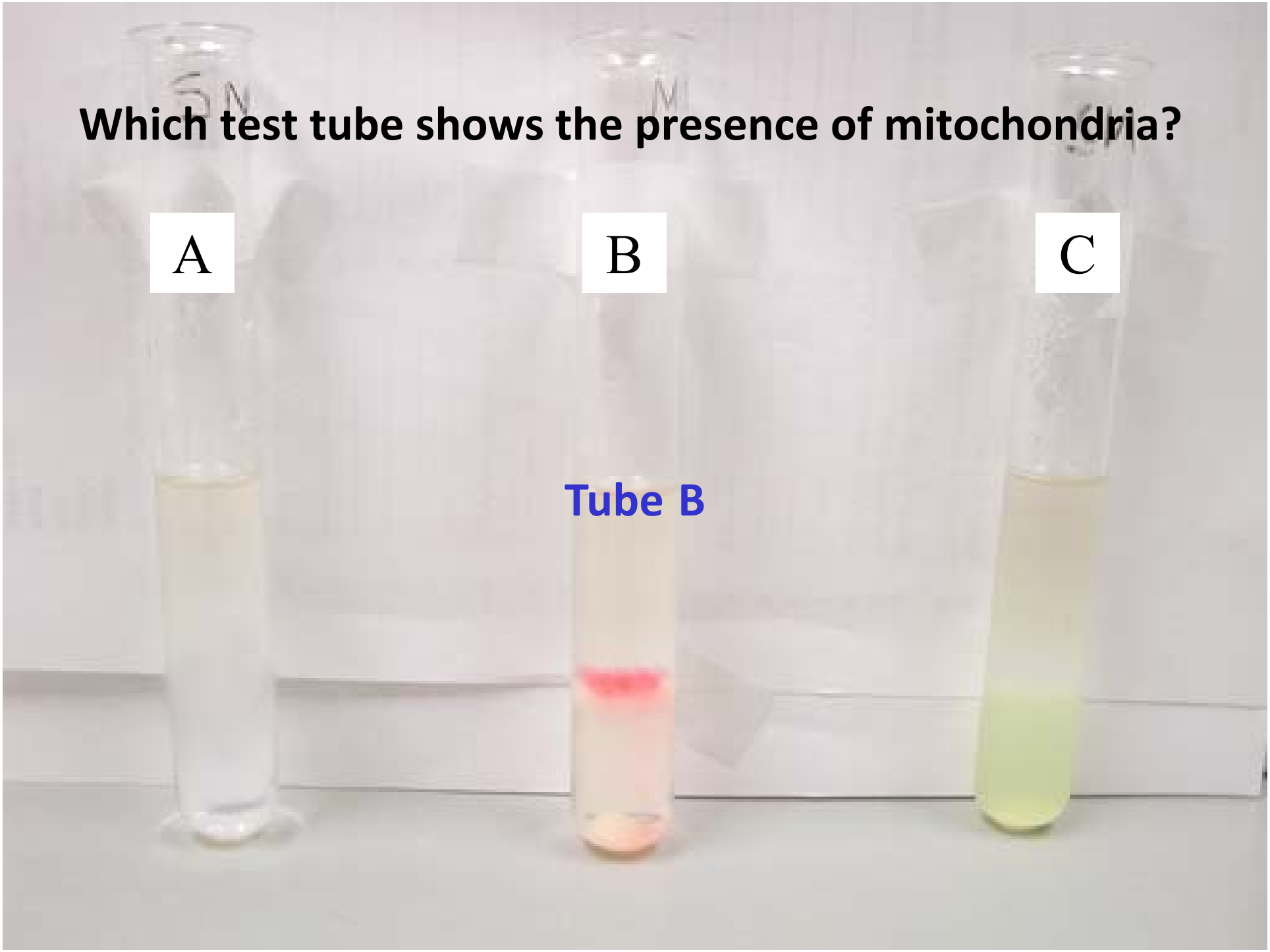
supernatant **mitochondria**

green layer of pellet **chloroplasts**

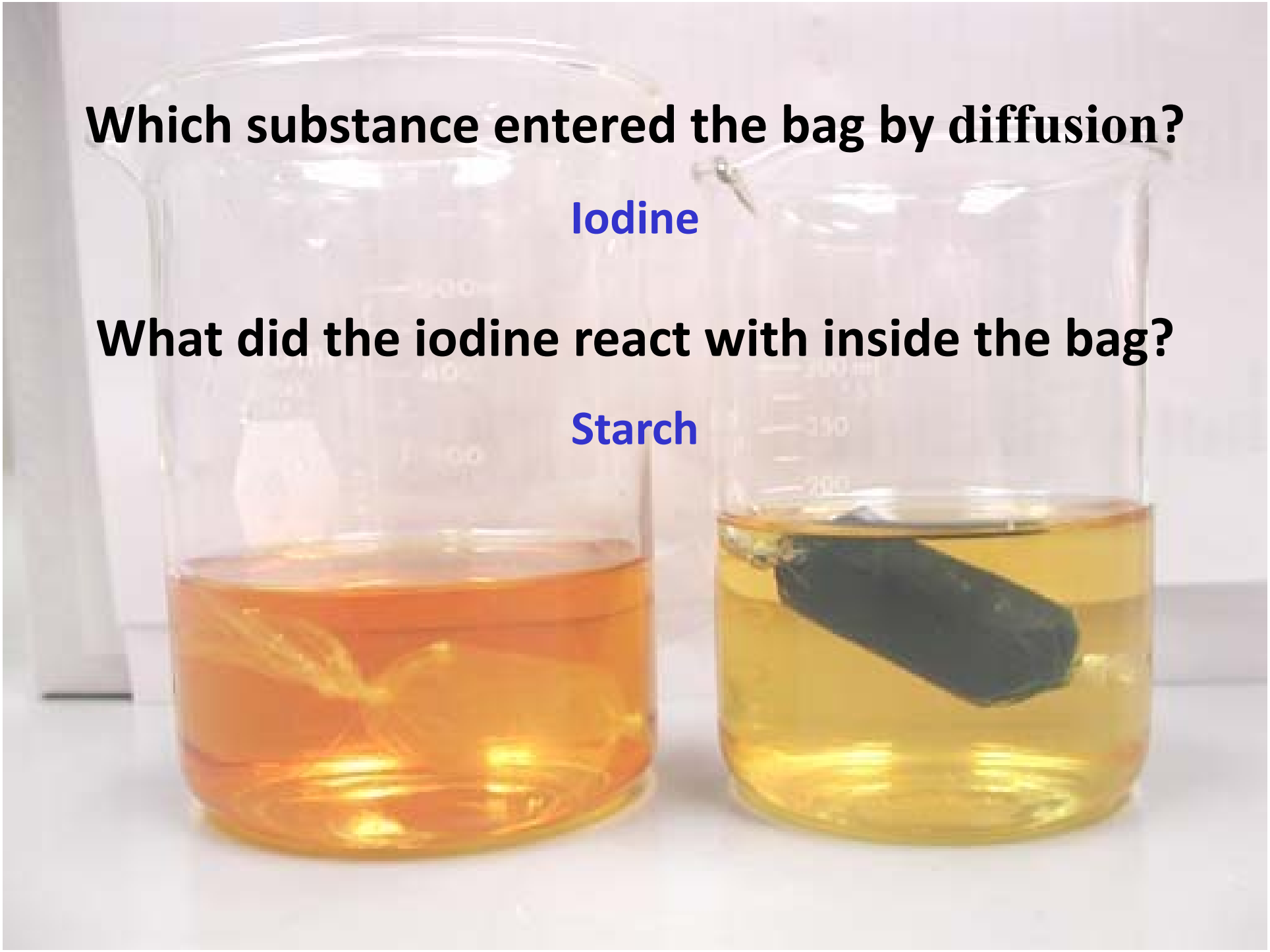
beige layer of pellet **nuclei**

white layer of pellet **starch grains**

Which test tube shows the presence of mitochondria?



Tube B



Which substance entered the bag by diffusion?

Iodine

What did the iodine react with inside the bag?

Starch

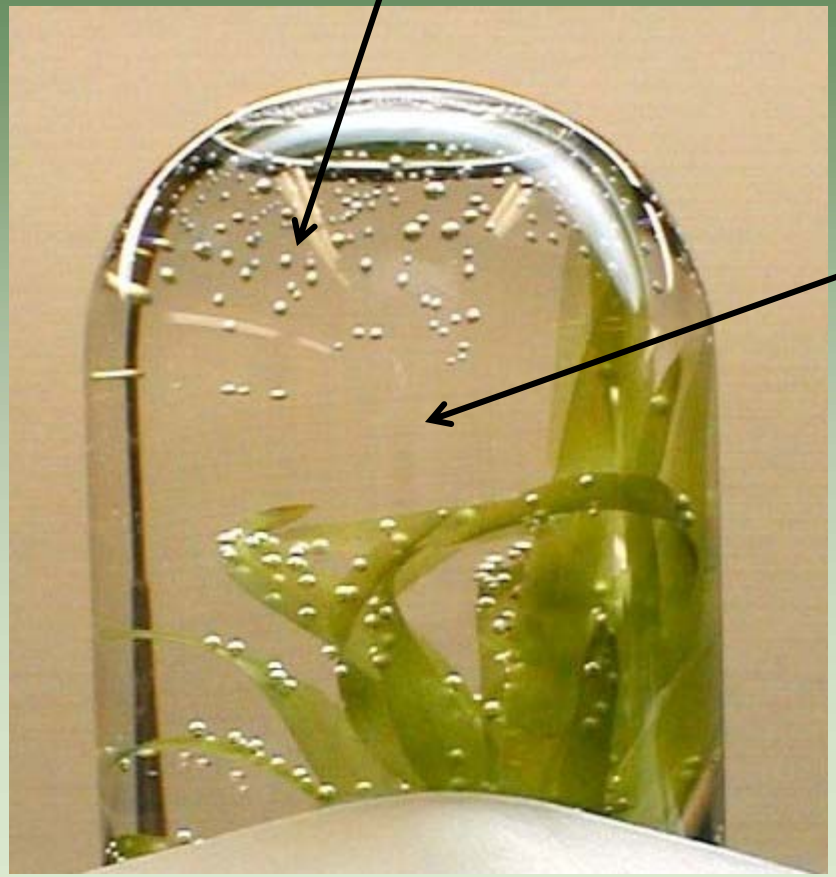
Photosynthesis

Name the instrument

Spectroscope

What gas is released by this Elodea plant as it performs photosynthesis?

Oxygen

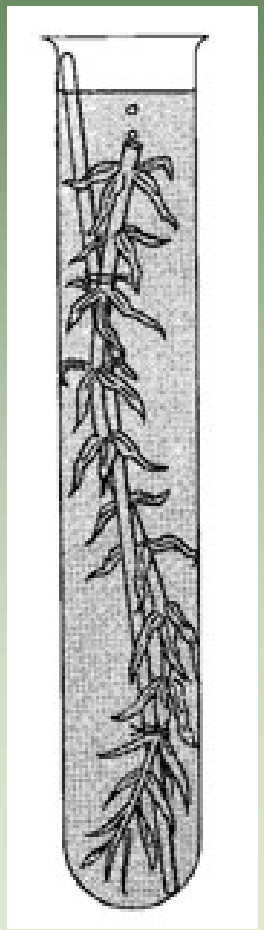


What solution acts as the carbon dioxide source for this Elodea plant?

Sodium bicarbonate

What is the function of the copper sulfate solution (blue) in the photosynthesis setup shown below?

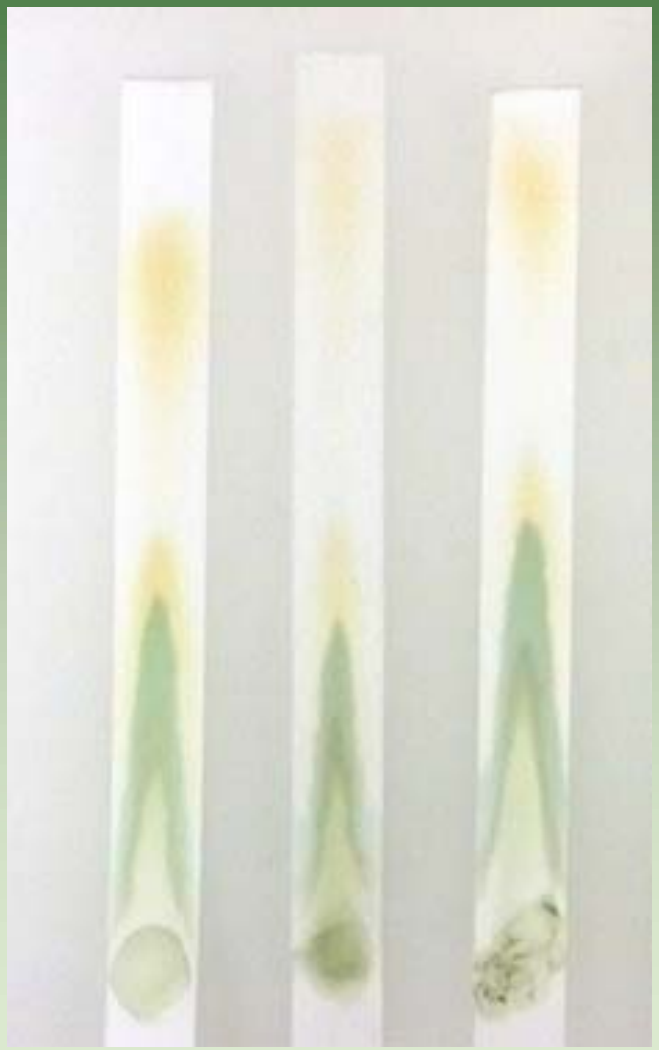
Filters out heat from light bulb



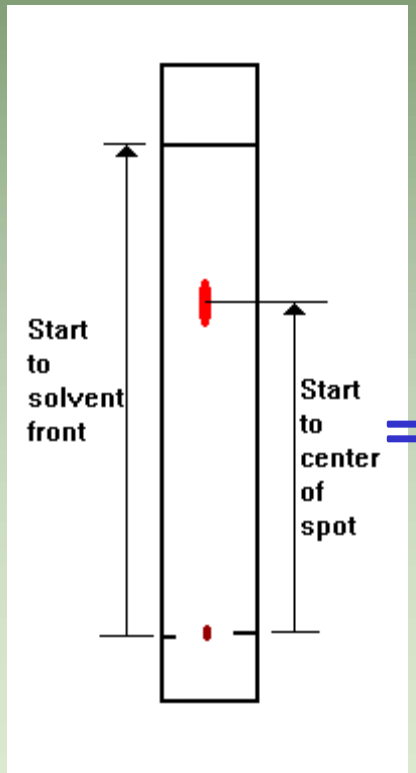
What is this experimental setup used for?

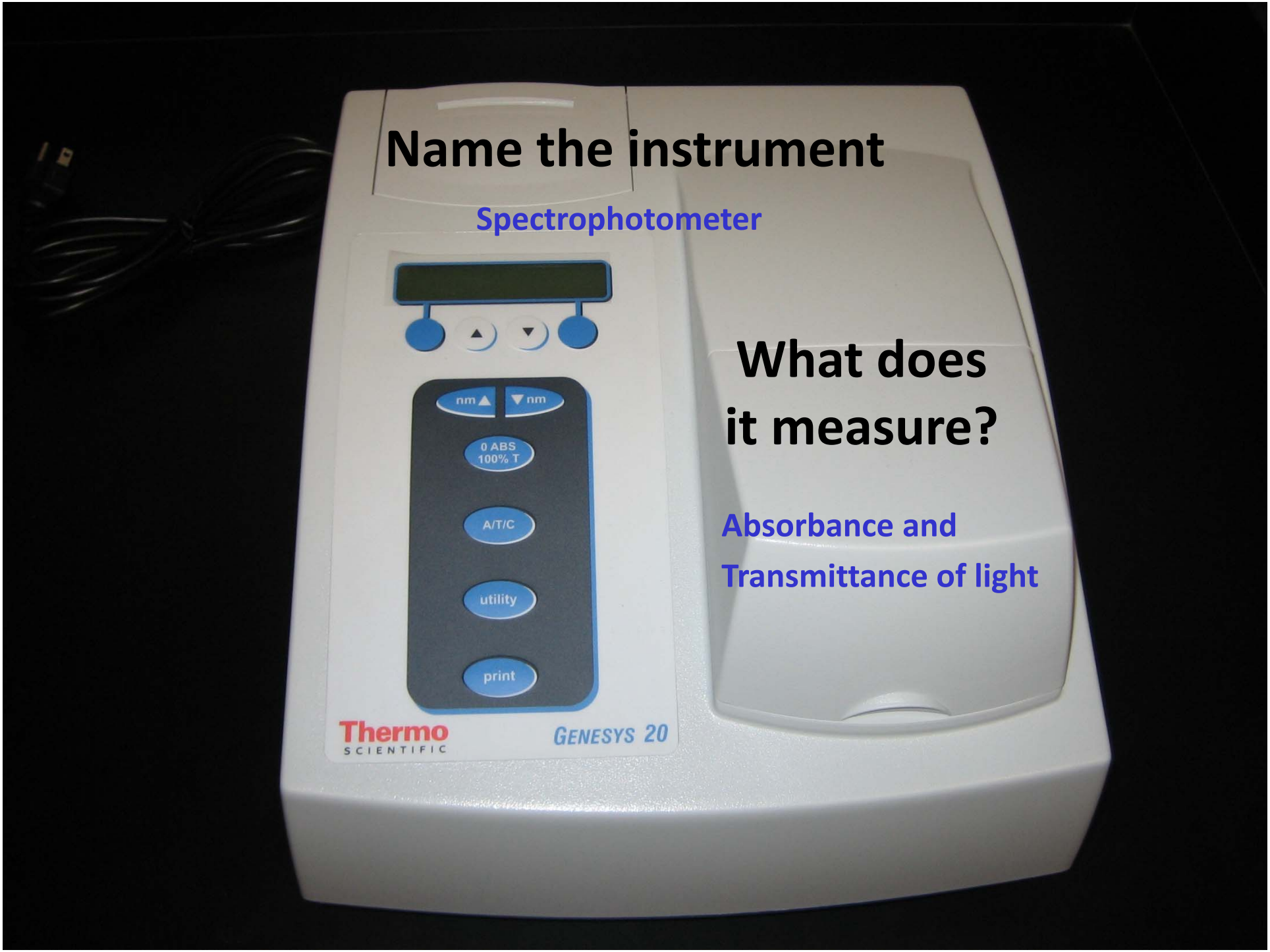
What solvent was used? acetone

How is the Ratio of Fronts (RF value) calculated for pigments separated by paper chromatography?

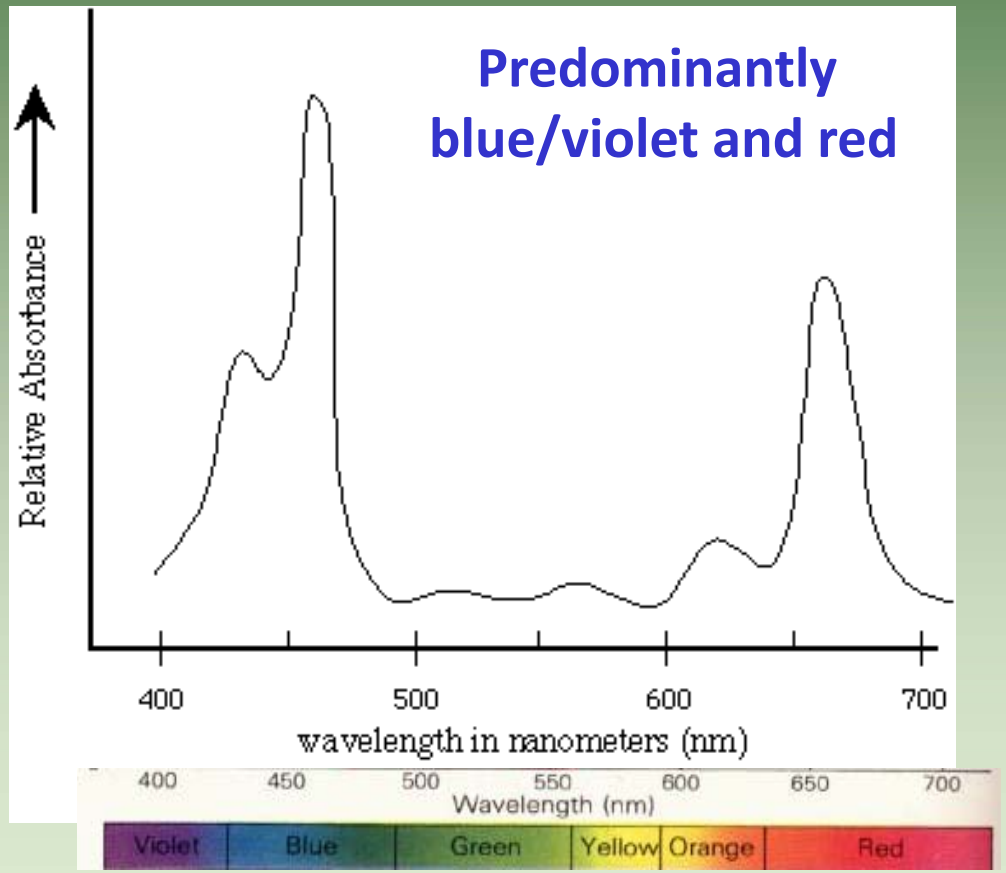


$$Rf = \frac{x \text{ (distance of pigment)}}{y \text{ (distance of solvent)}}$$




Name the instrument
Spectrophotometer
What does it measure?
Absorbance and Transmittance of light
nm▲
▼nm
0 ABS 100% T
A/T/C
utility
print
Thermo SCIENTIFIC
GENESYS 20

The absorption spectrum for chlorophyll is shown below. According to this chart, what colors of light are absorbed by green plants?



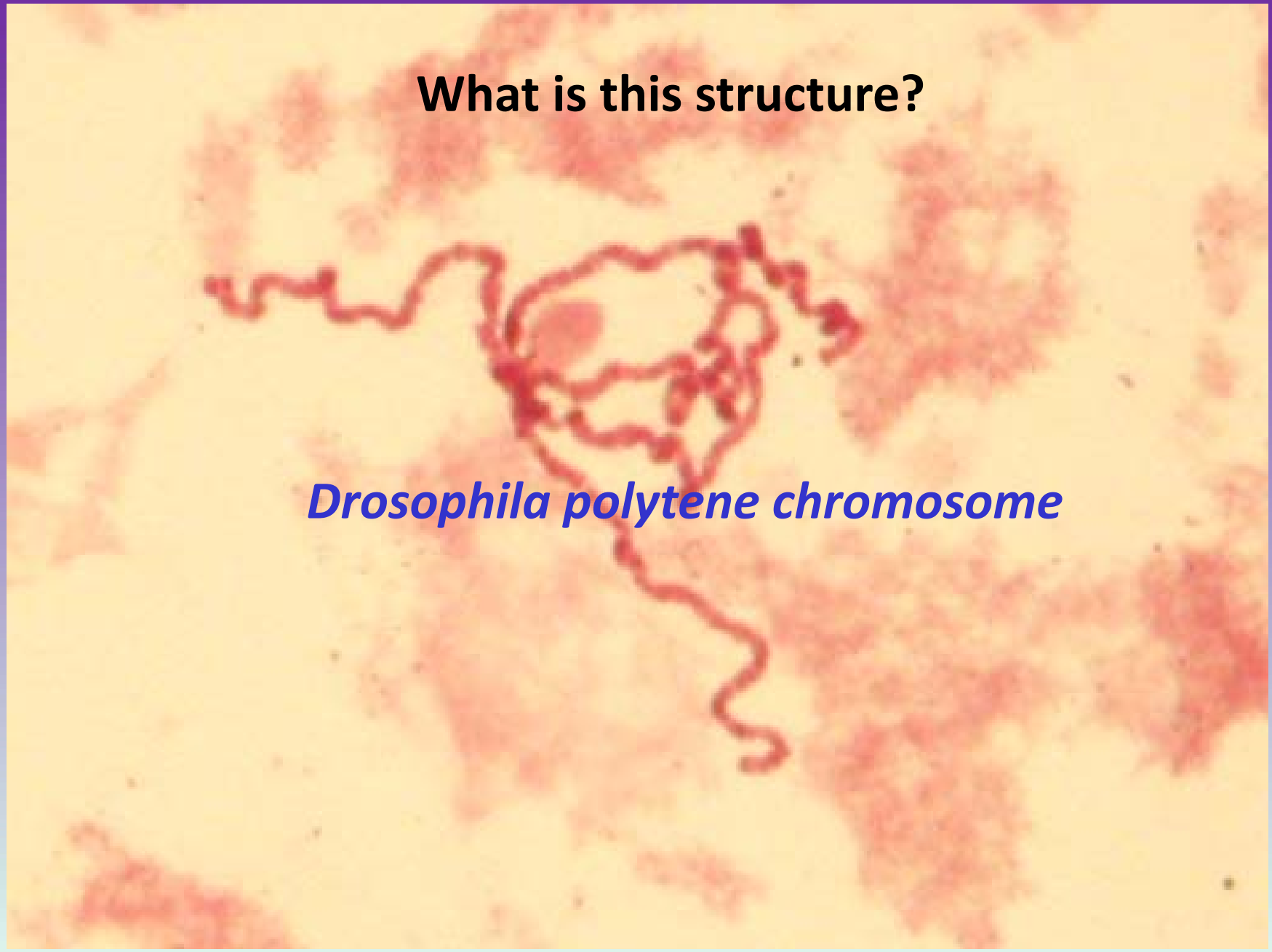
DNA Extraction Lab
From Fruit Fly & Onion

Identify this organism and the tissue that you dissected from it.

Fruit fly (Drosophila) larvae

Salivary glands

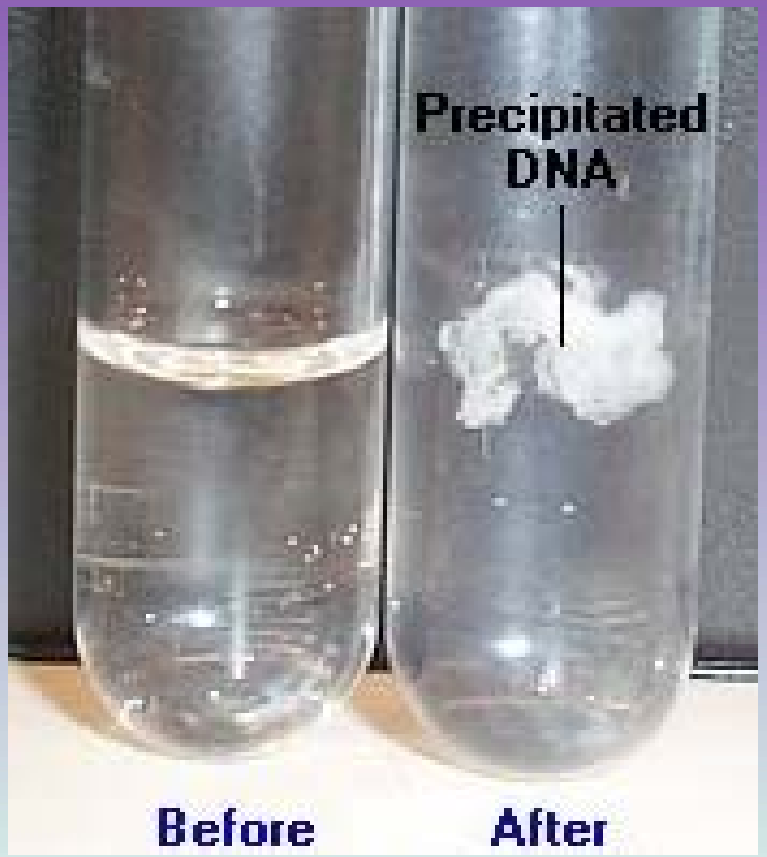
What is this structure?



Drosophila polytene chromosome

What reagent was added to the onion DNA tube to make the DNA precipitate (turn solid) ?

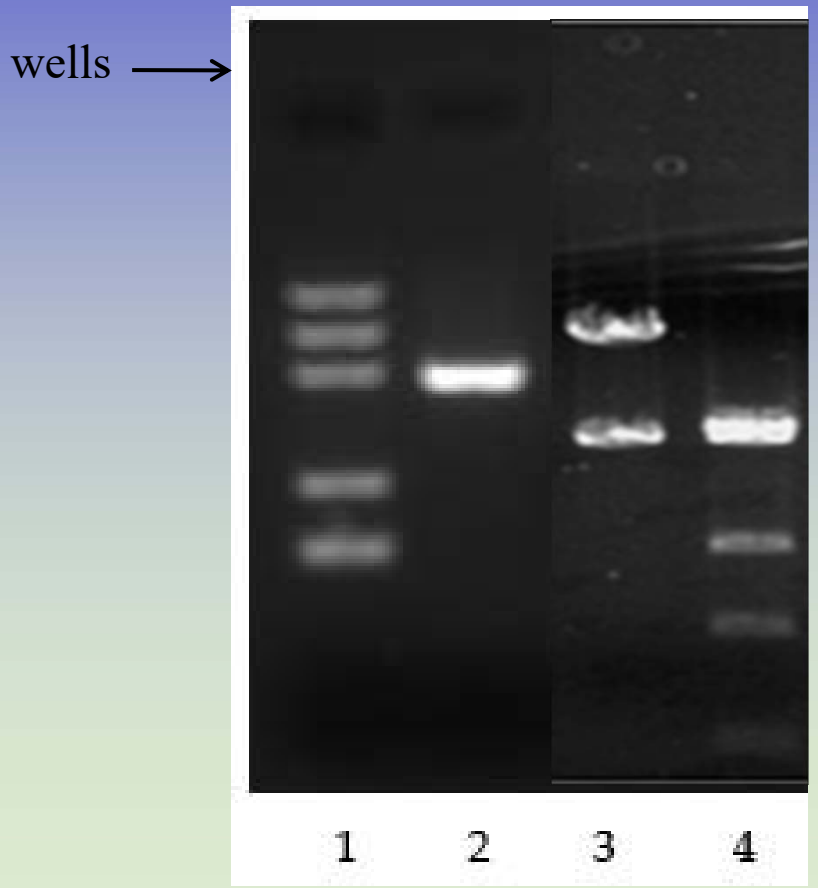
Cold 95% Ethanol



Micropipetting/Electrophoresis

What is the substance that gels are made of?

The gel below shows DNA cut by the restriction enzyme EcoRI. How many times did EcoRI cut the DNA sample in Lane 2?



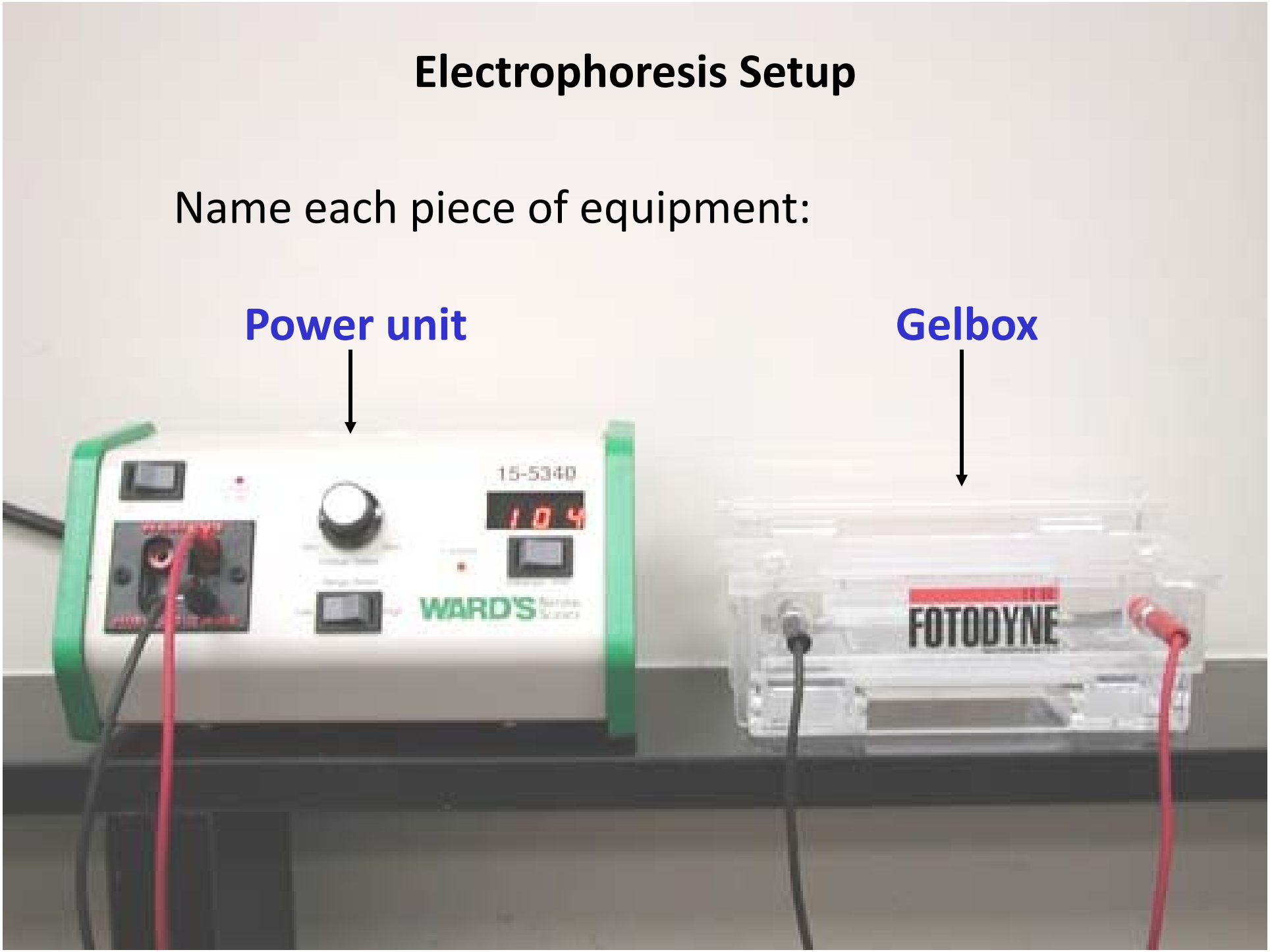
Lane 2 = 0 cuts

–In Lane 4?

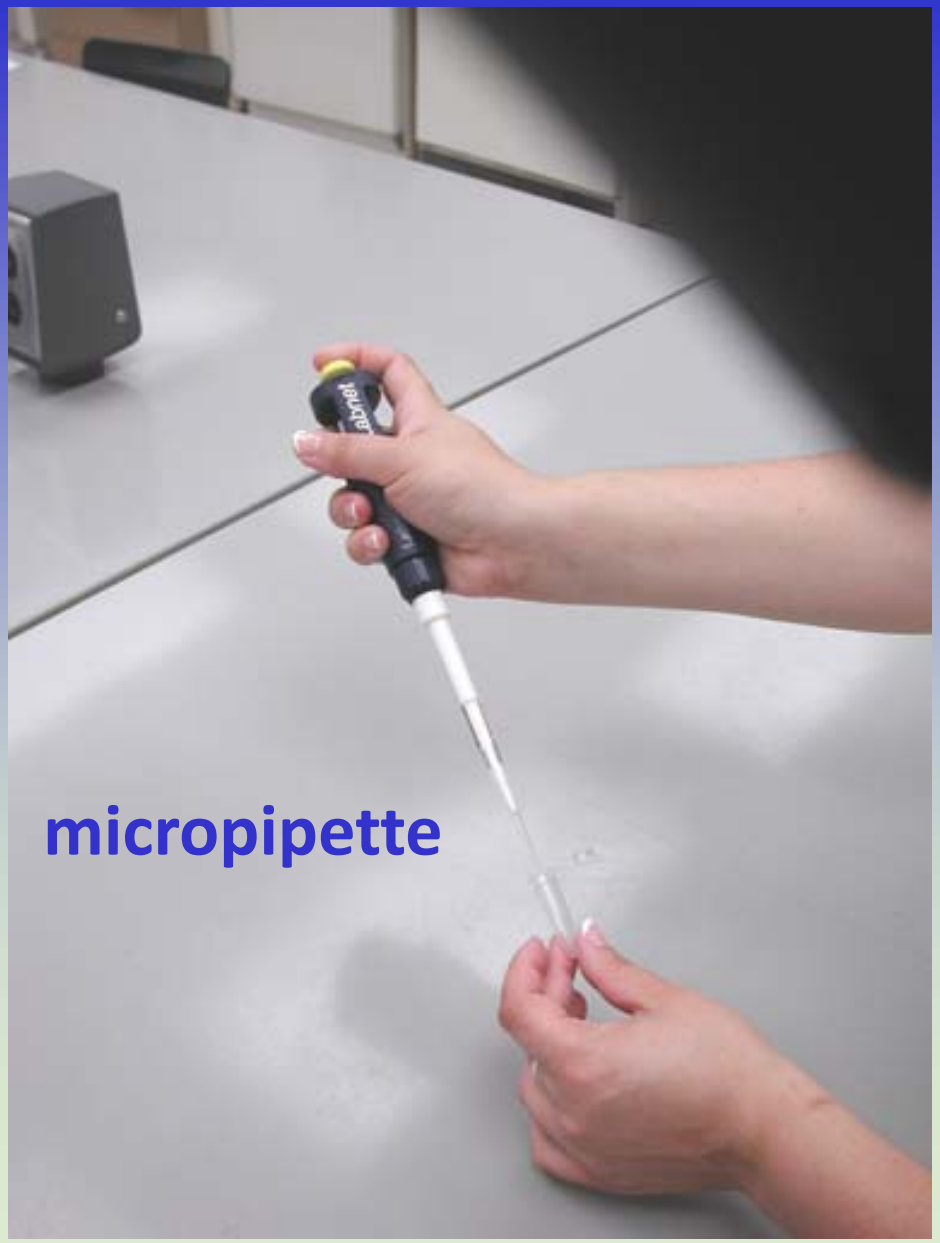
Lane 4 = 3 cuts

Electrophoresis Setup

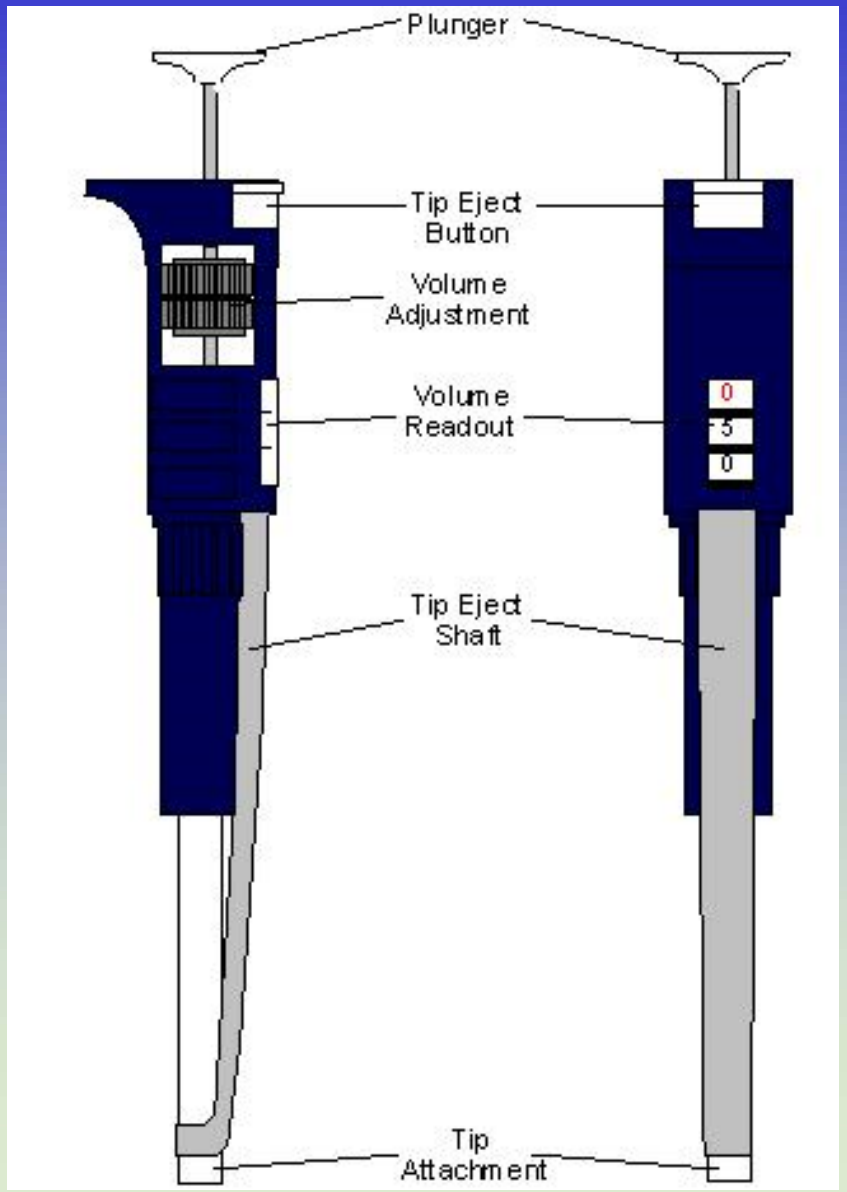
Name each piece of equipment:



What is the name of this instrument?



If this is a p200 micropipette, what volume is it set to?

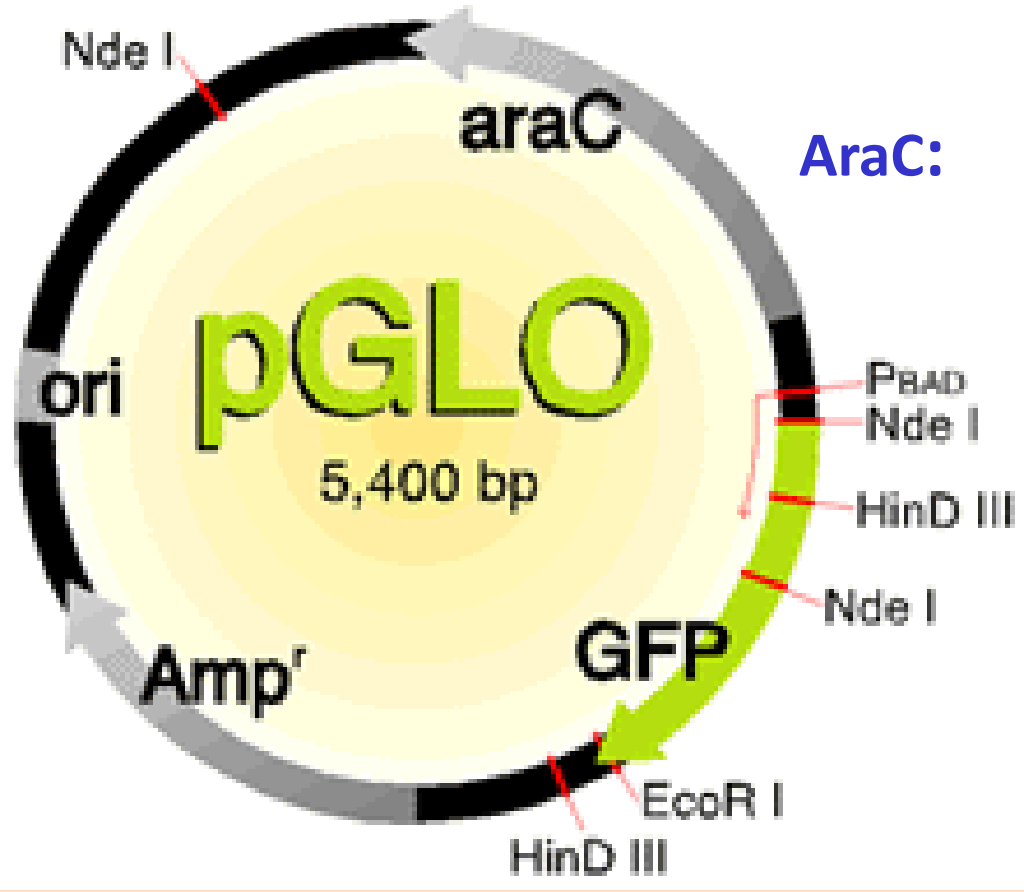


50 microliters (ul)

Bacterial Transformation and Protein Purification Lab

What is the function of the three genes found on the pGLO plasmid?

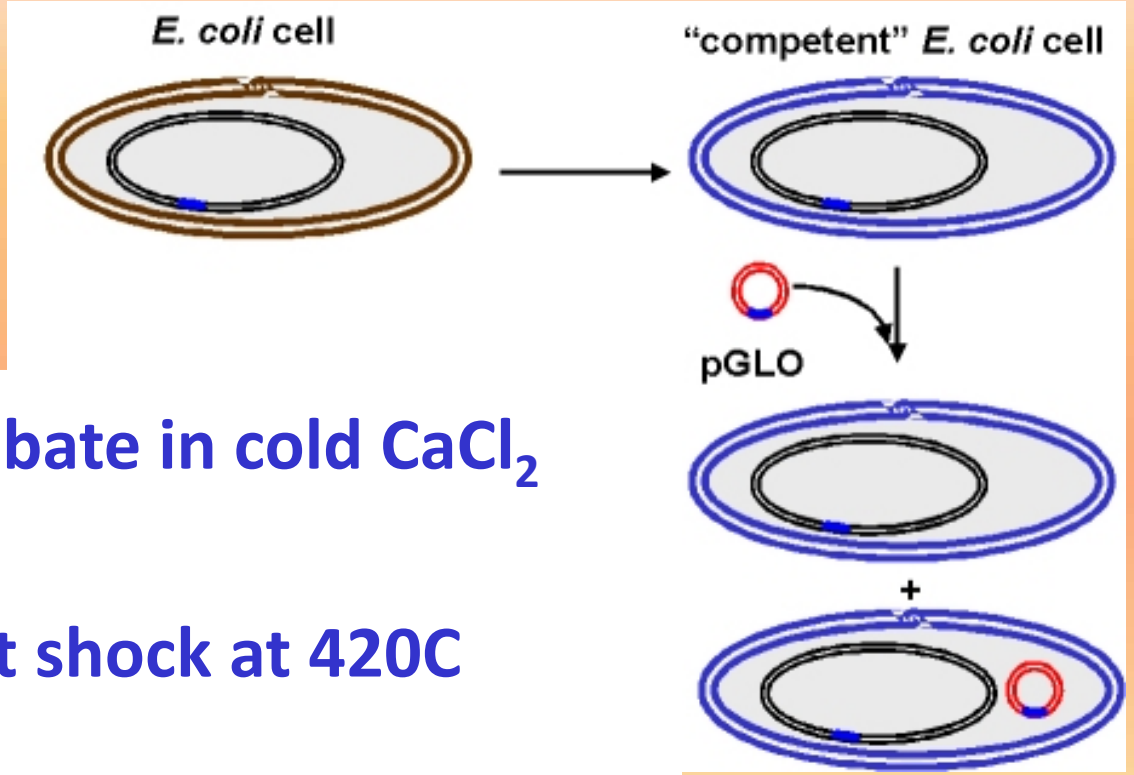
AmpR = **resistance to ampicillin (selection marker)**



AraC: **activates GFP. Activated by arabinose**

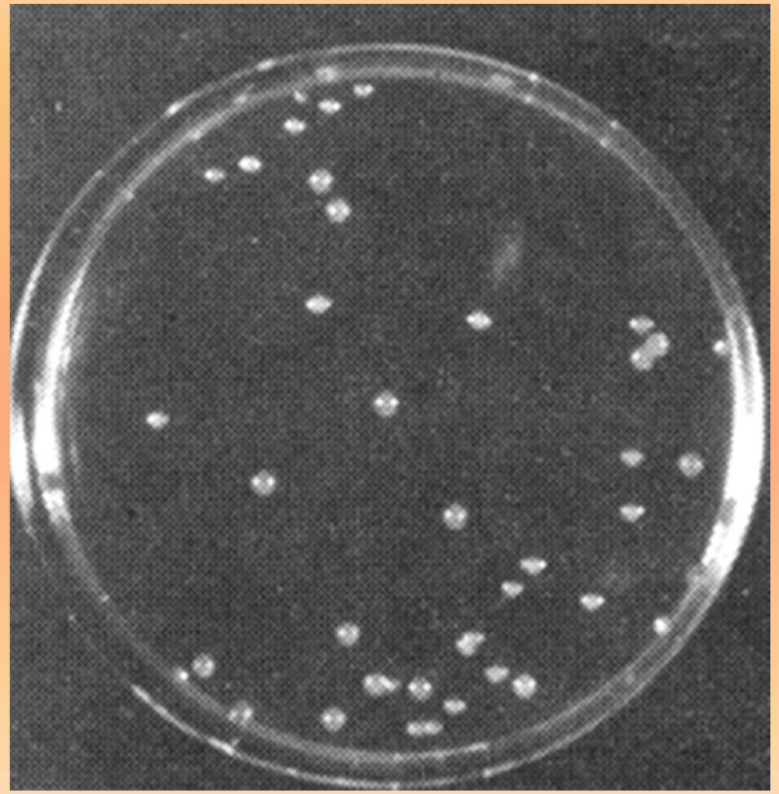
GFP: **green fluorescent protein**

What two treatments are needed to get bacteria to absorb plasmid DNA (aka transformation)?



1. Incubate in cold $CaCl_2$
2. Heat shock at 420C

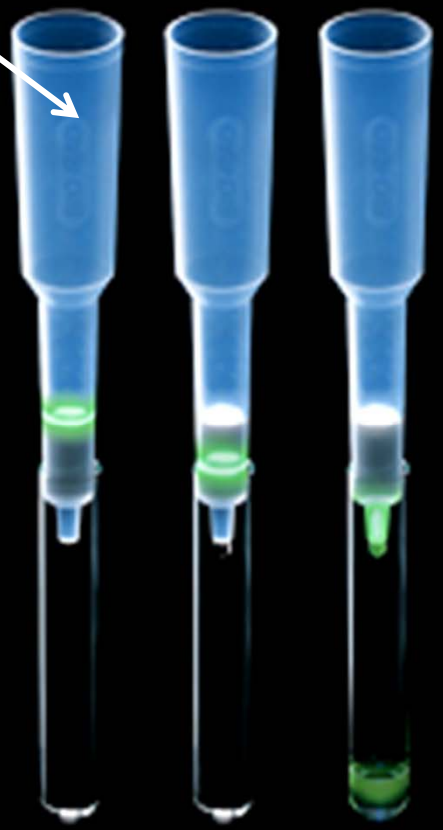
What is the transformation efficiency for the P+ plate shown below if 2 ug of DNA were used in the transformation experiment?



$$TE = \frac{37 \text{ colonies}}{2\text{ug DNA}}$$

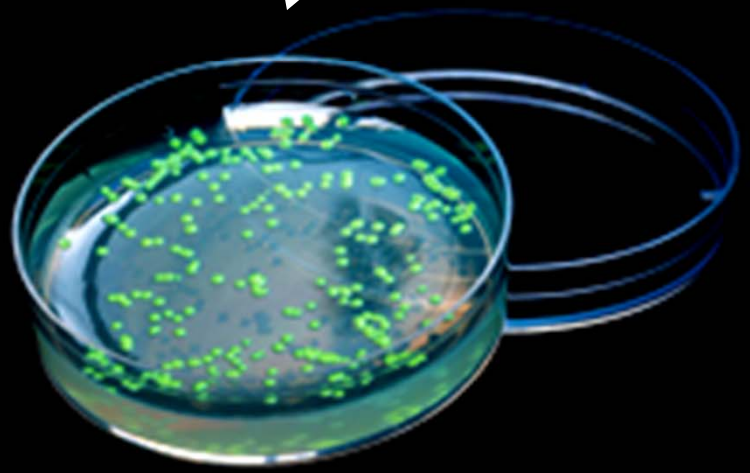
What is the name for this column?

Hydrophobic interaction column



What type of light makes these colonies “glow”?

Ultra violet

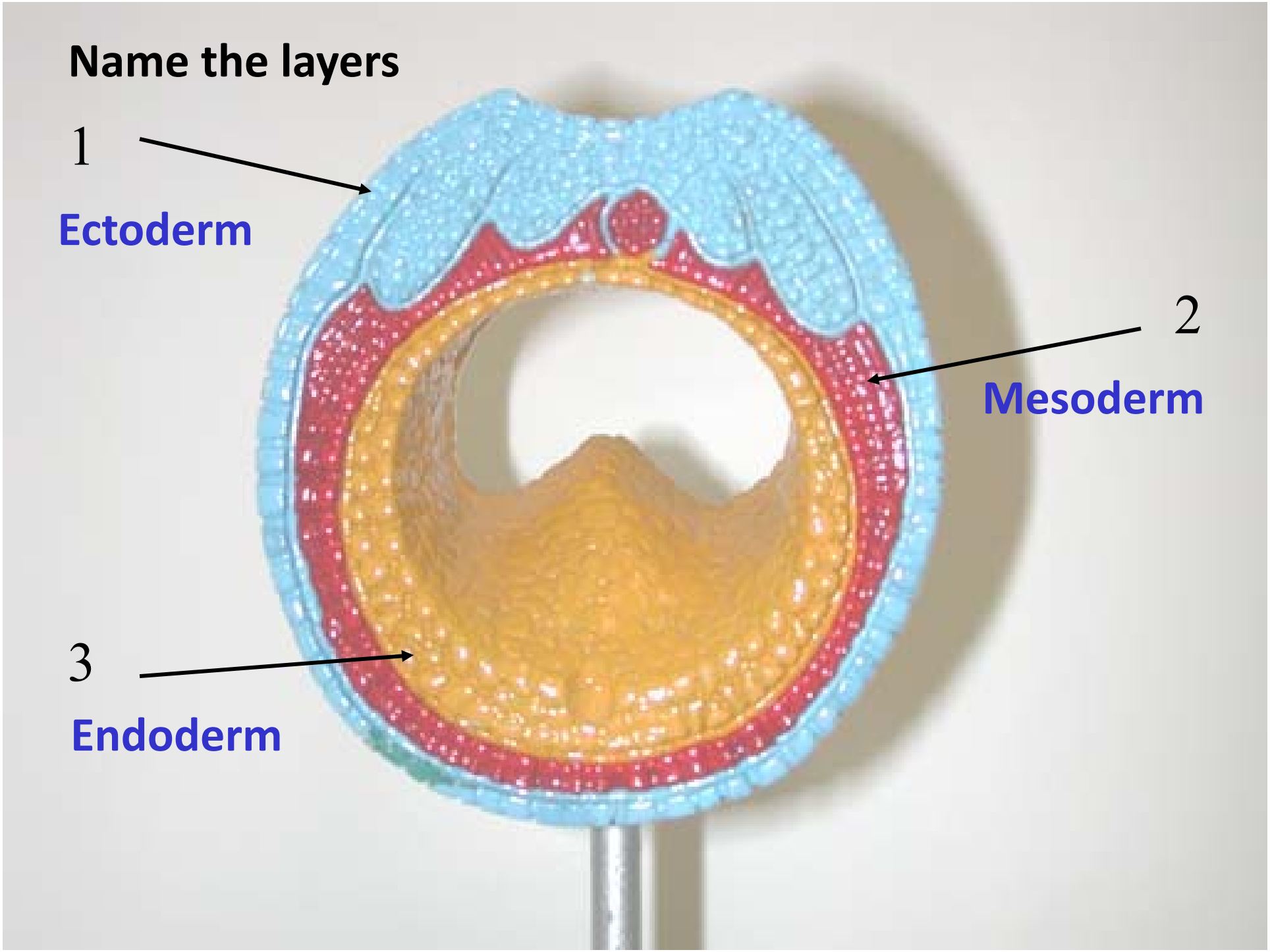


What is the name of this protein?

GFP, green fluorescent protein

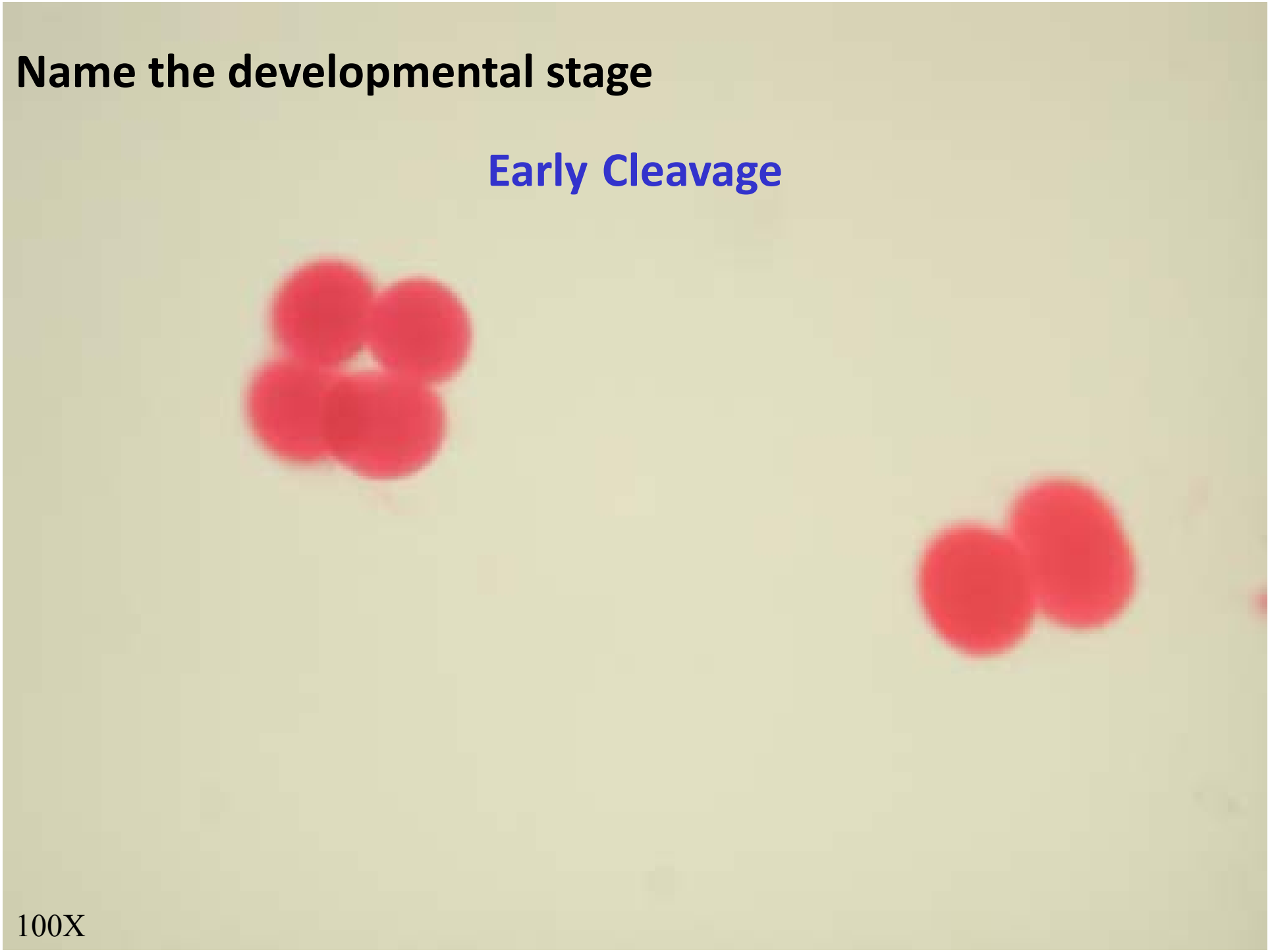
Embryology

Name the layers

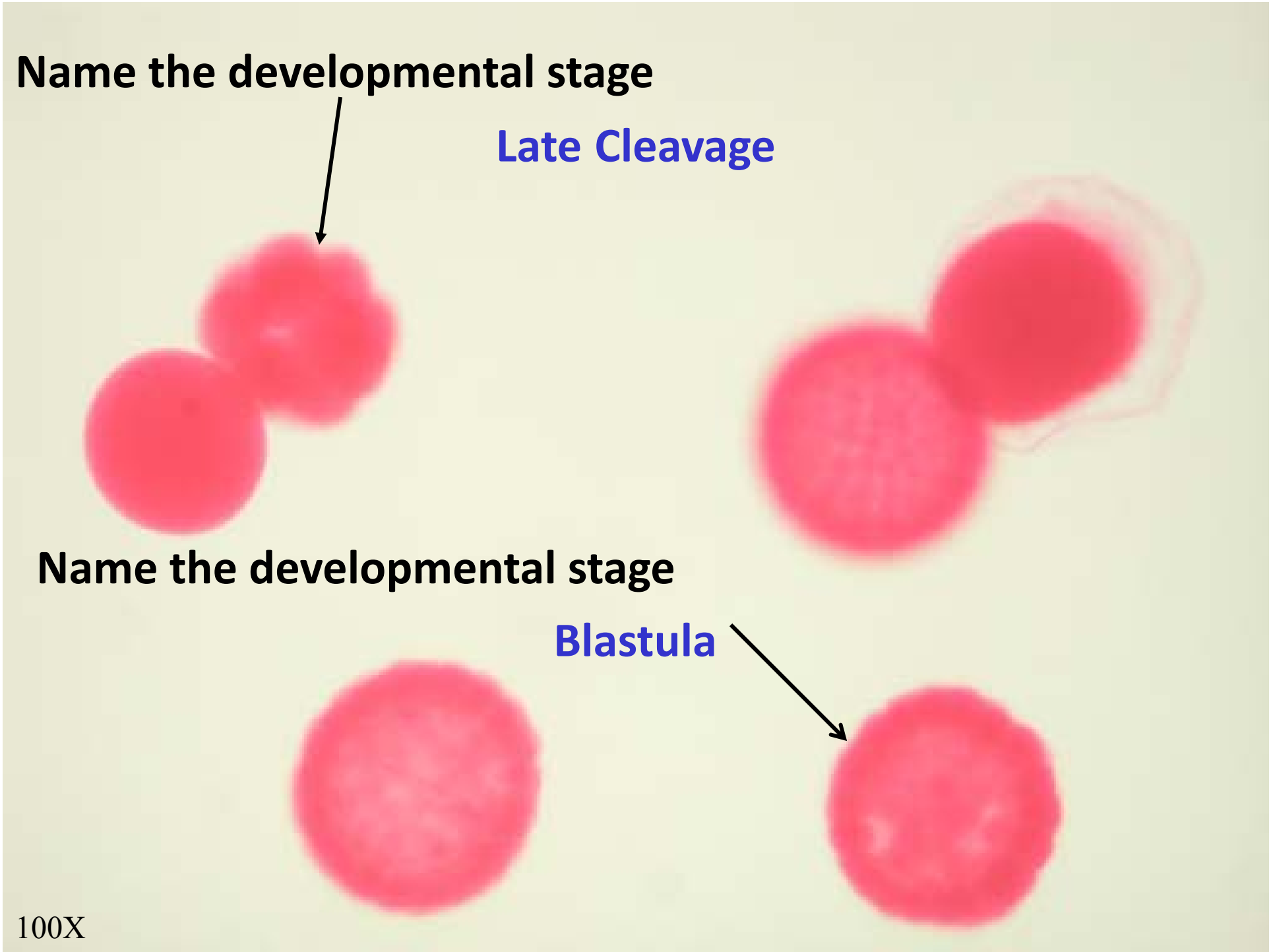


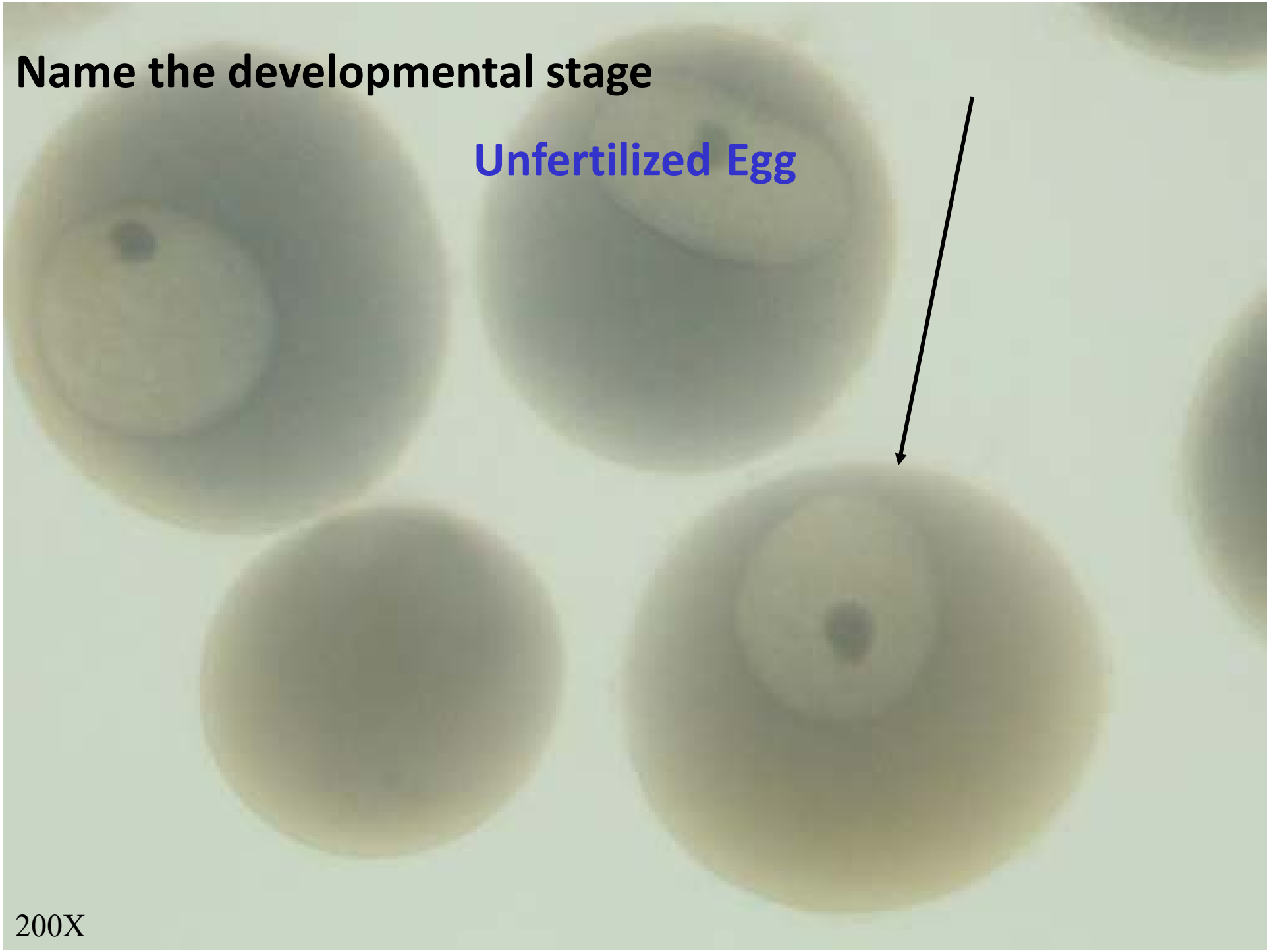
Name the developmental stage

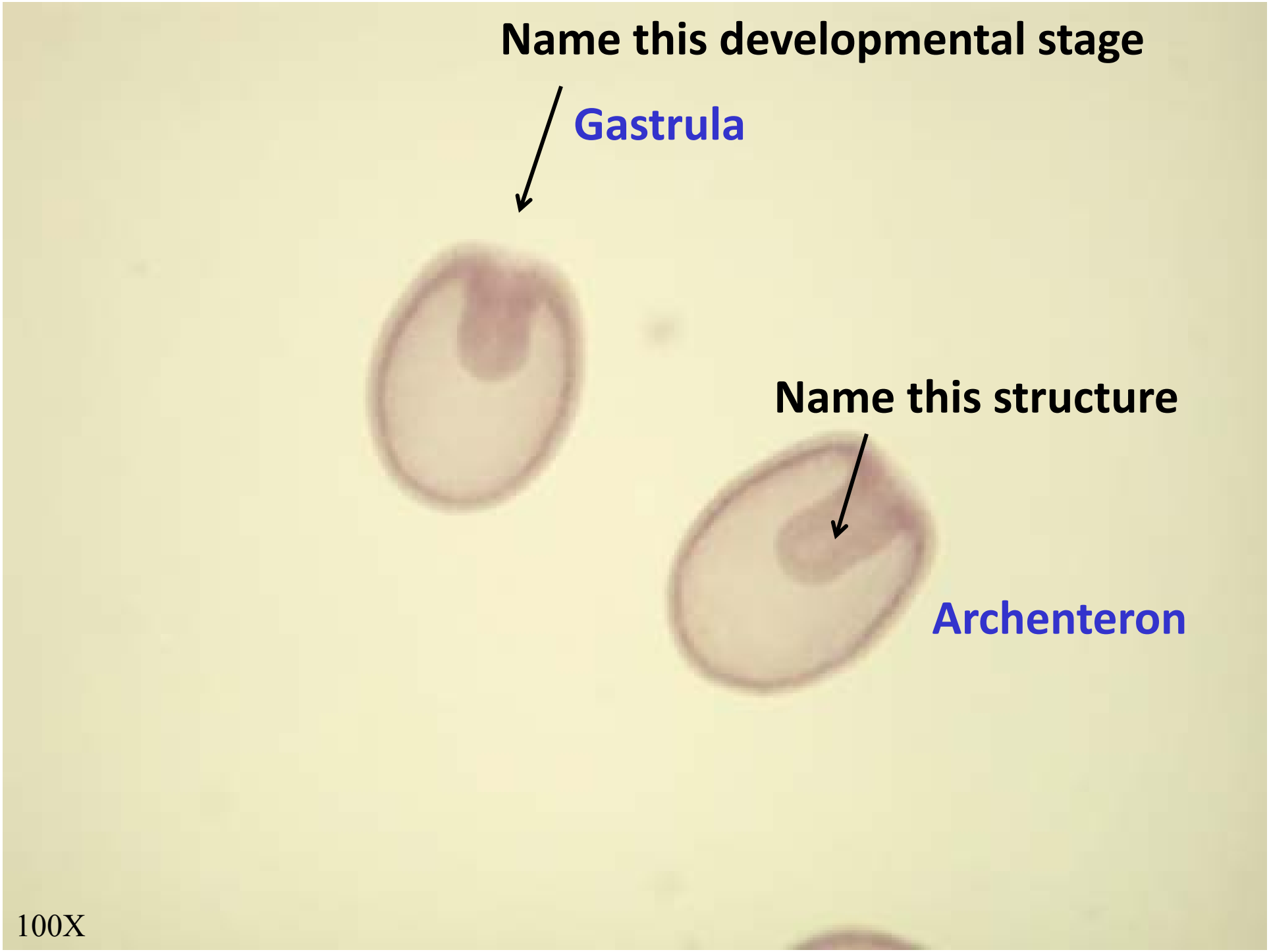
Early Cleavage



100X

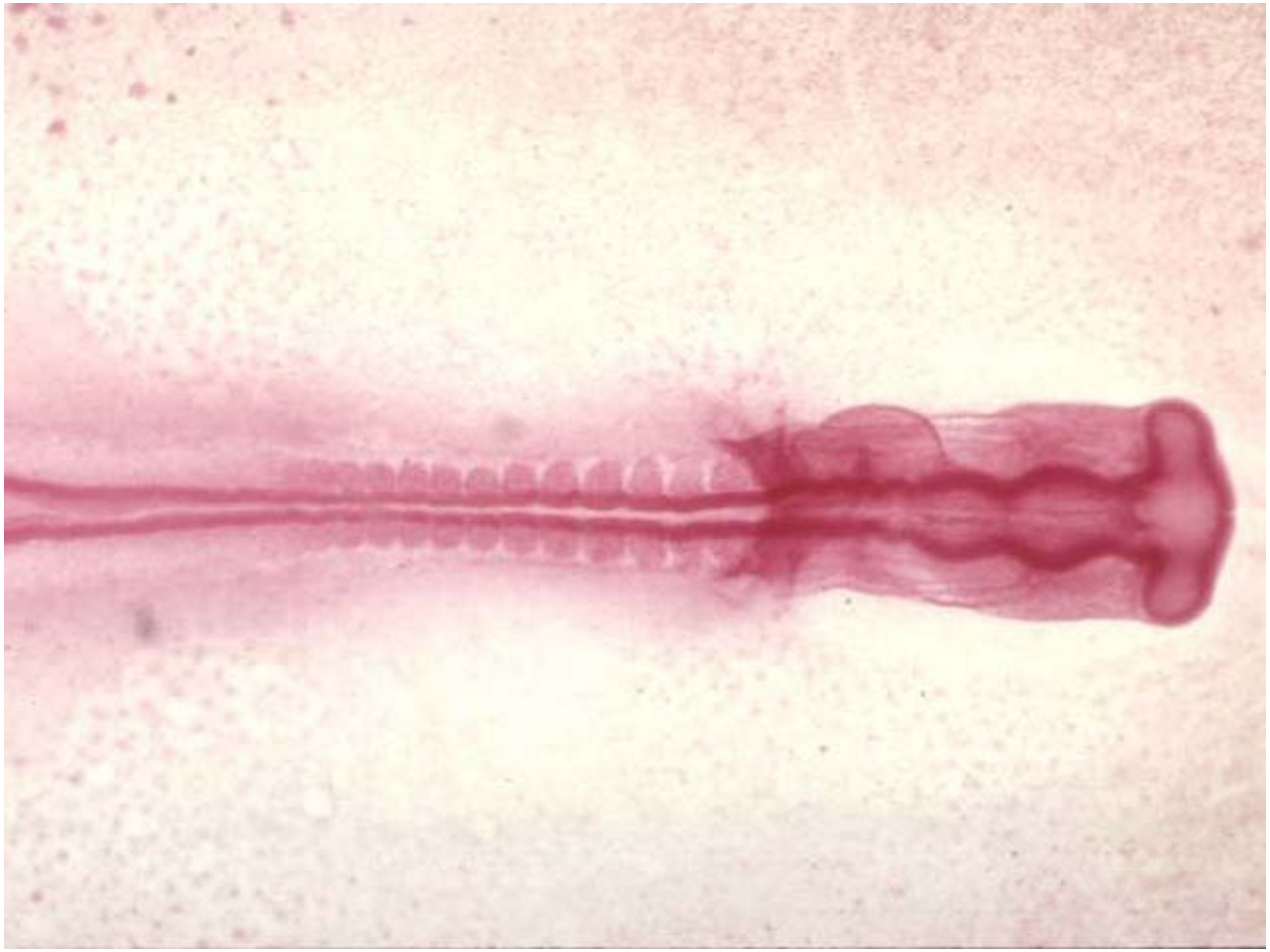

Name the developmental stage
Late Cleavage
Name the developmental stage
Blastula
100X


Name the developmental stage
Unfertilized Egg
200X


Name this developmental stage
Gastrula
Name this structure
Archenteron
100X

Name this organism

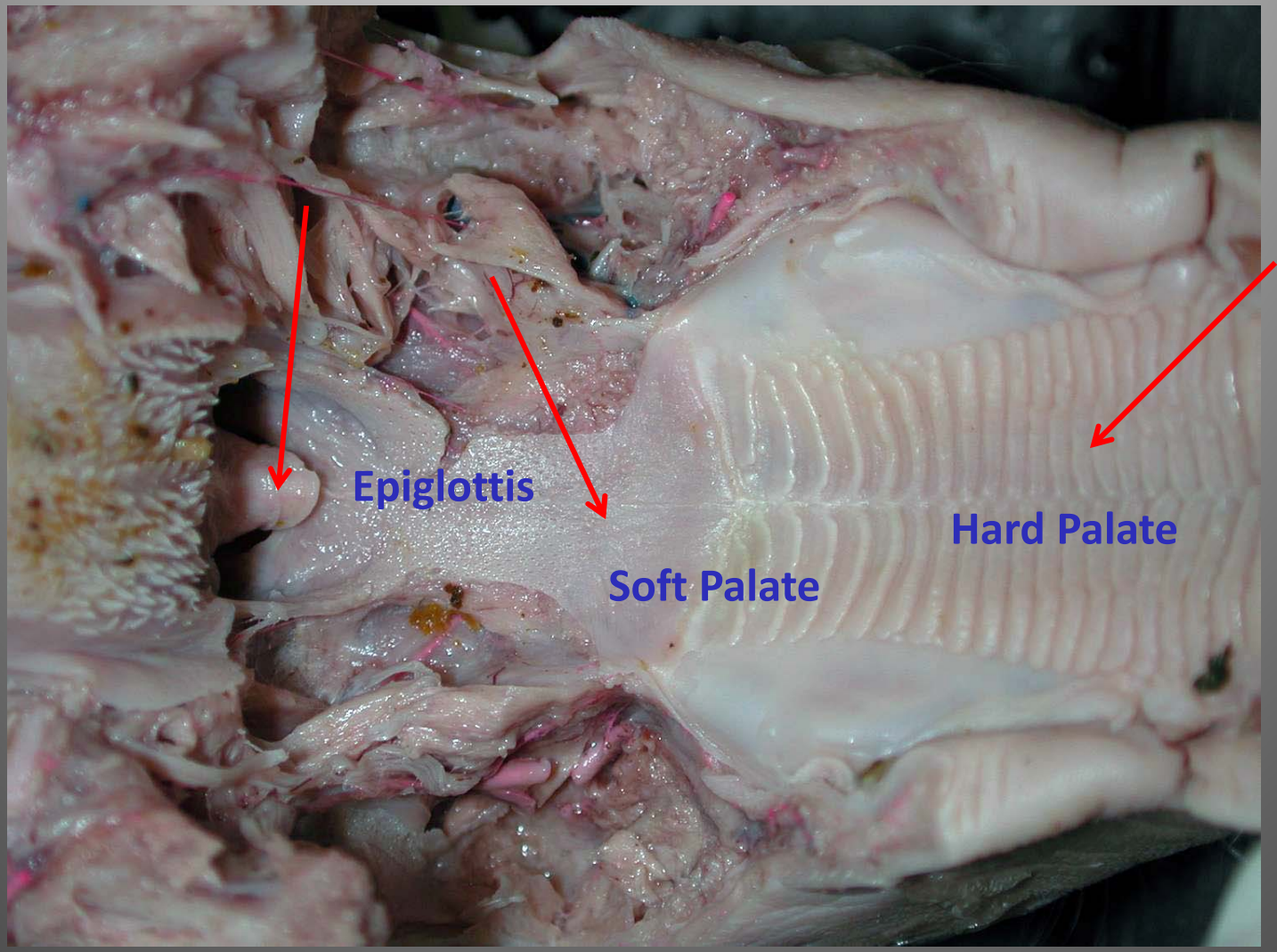
24-33 hr Chicken Embryo



Pig Anatomy & Histology

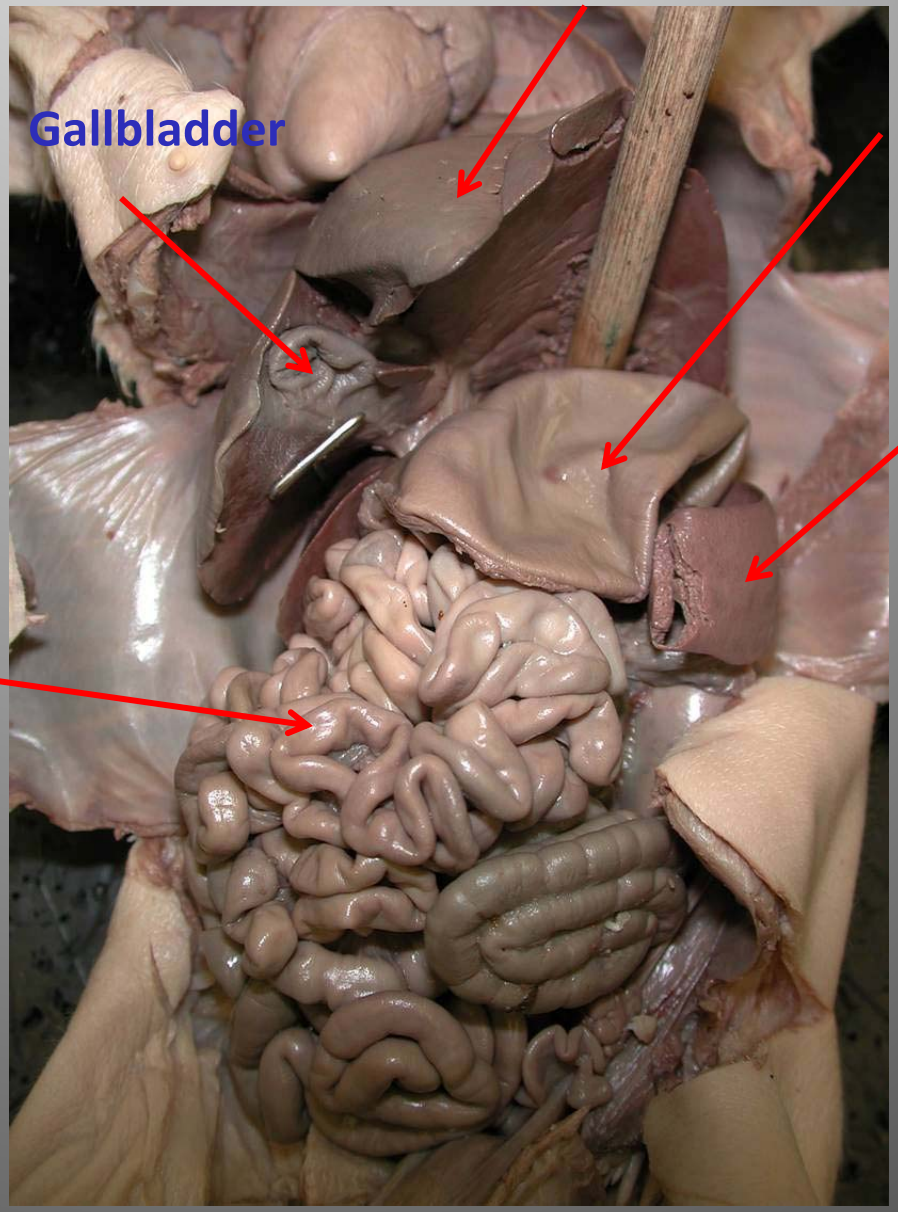
Oral Cavity

Name the following structures:



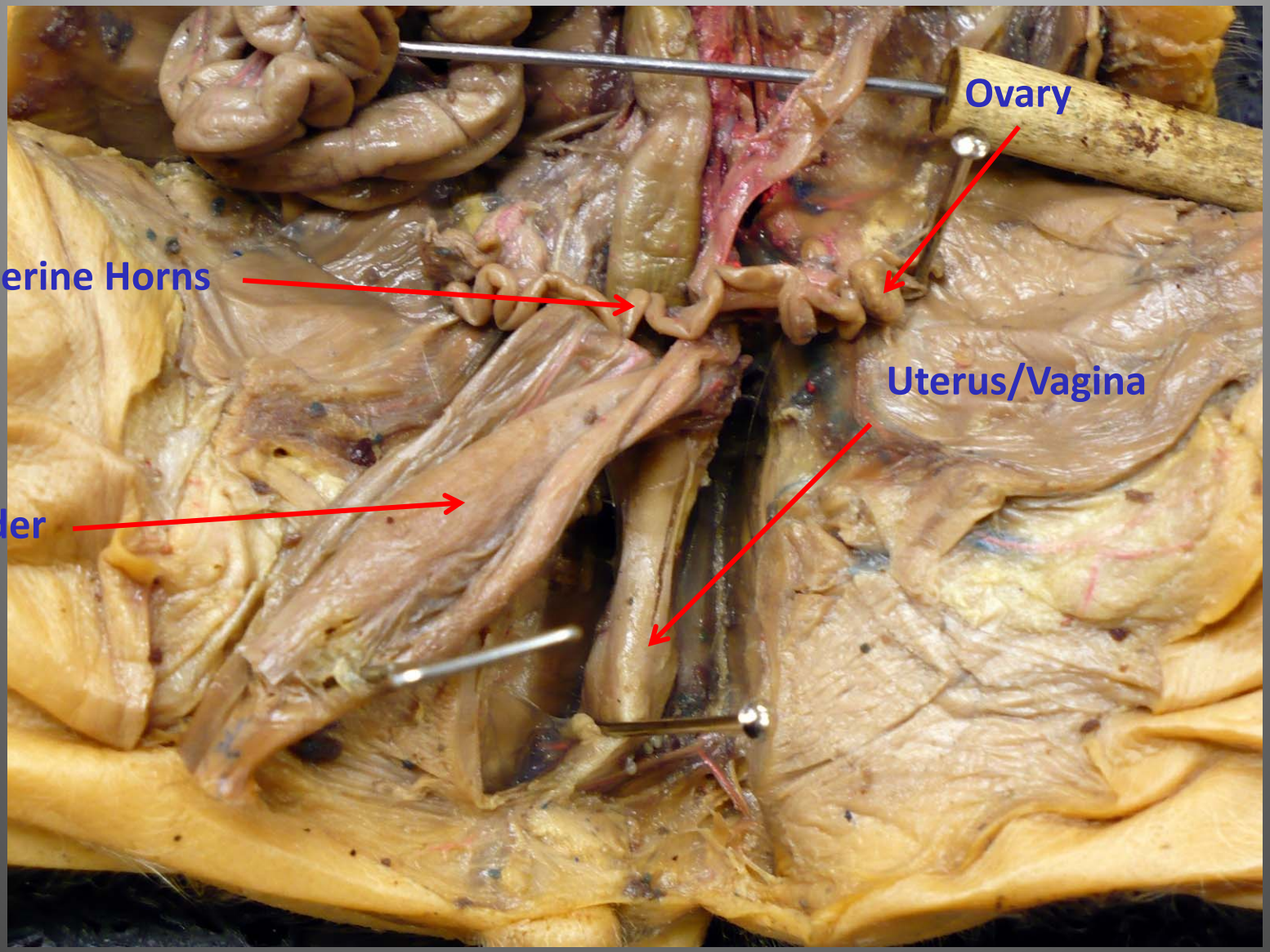
Abdominal Cavity

Name the organs:



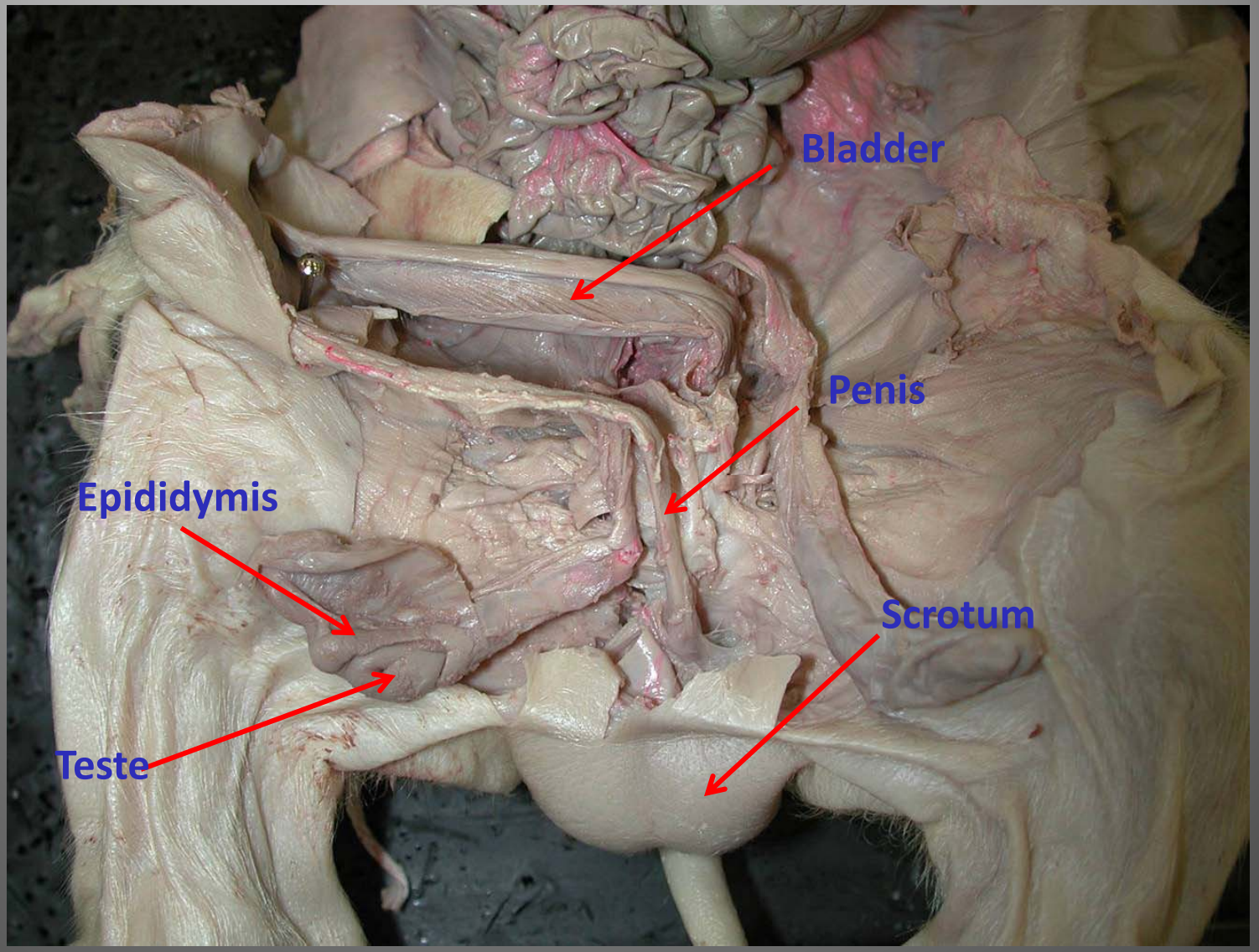
Female Urogenital Tract

Name the following organs:



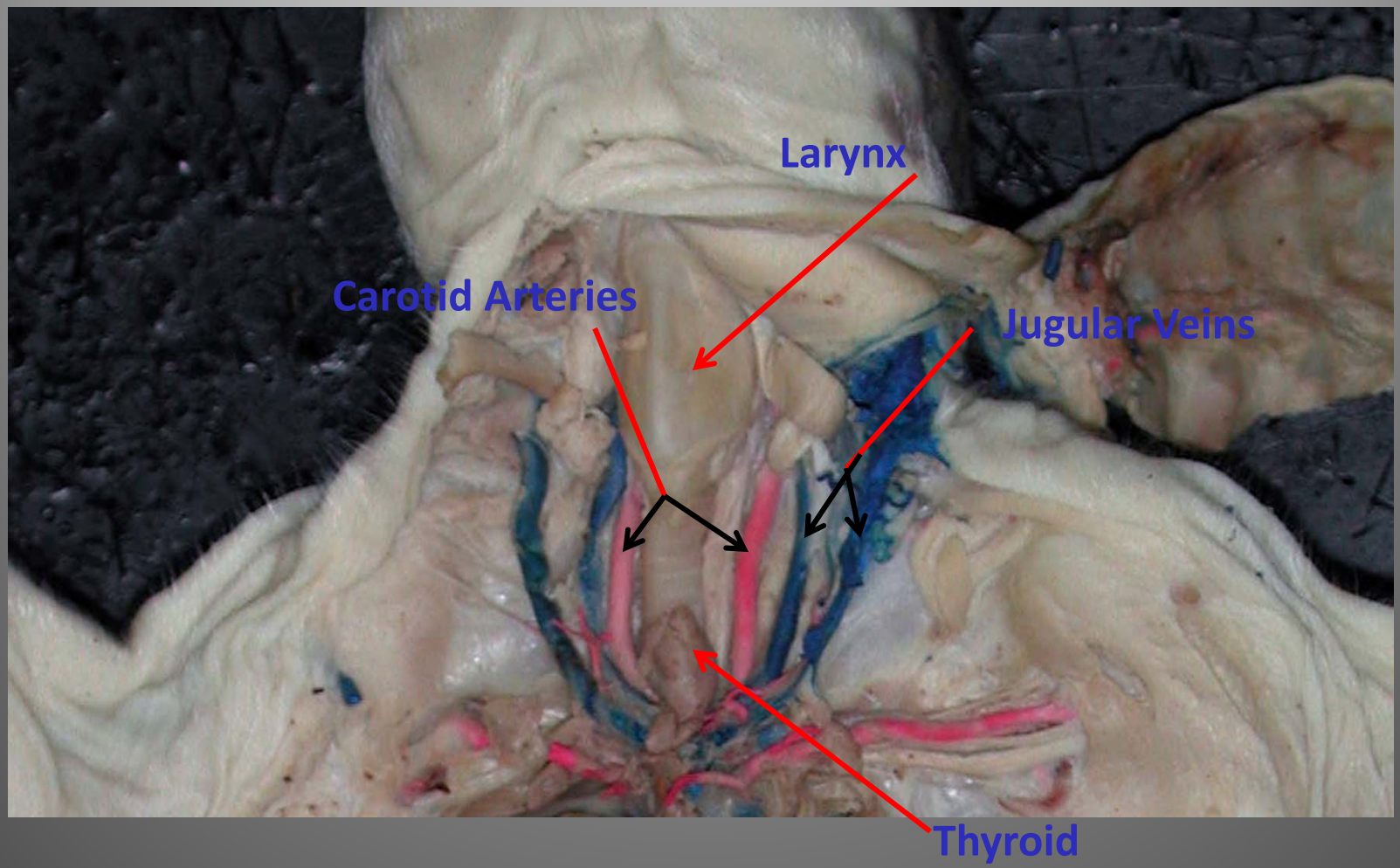
Male Urogenital Tract

Name the organs:



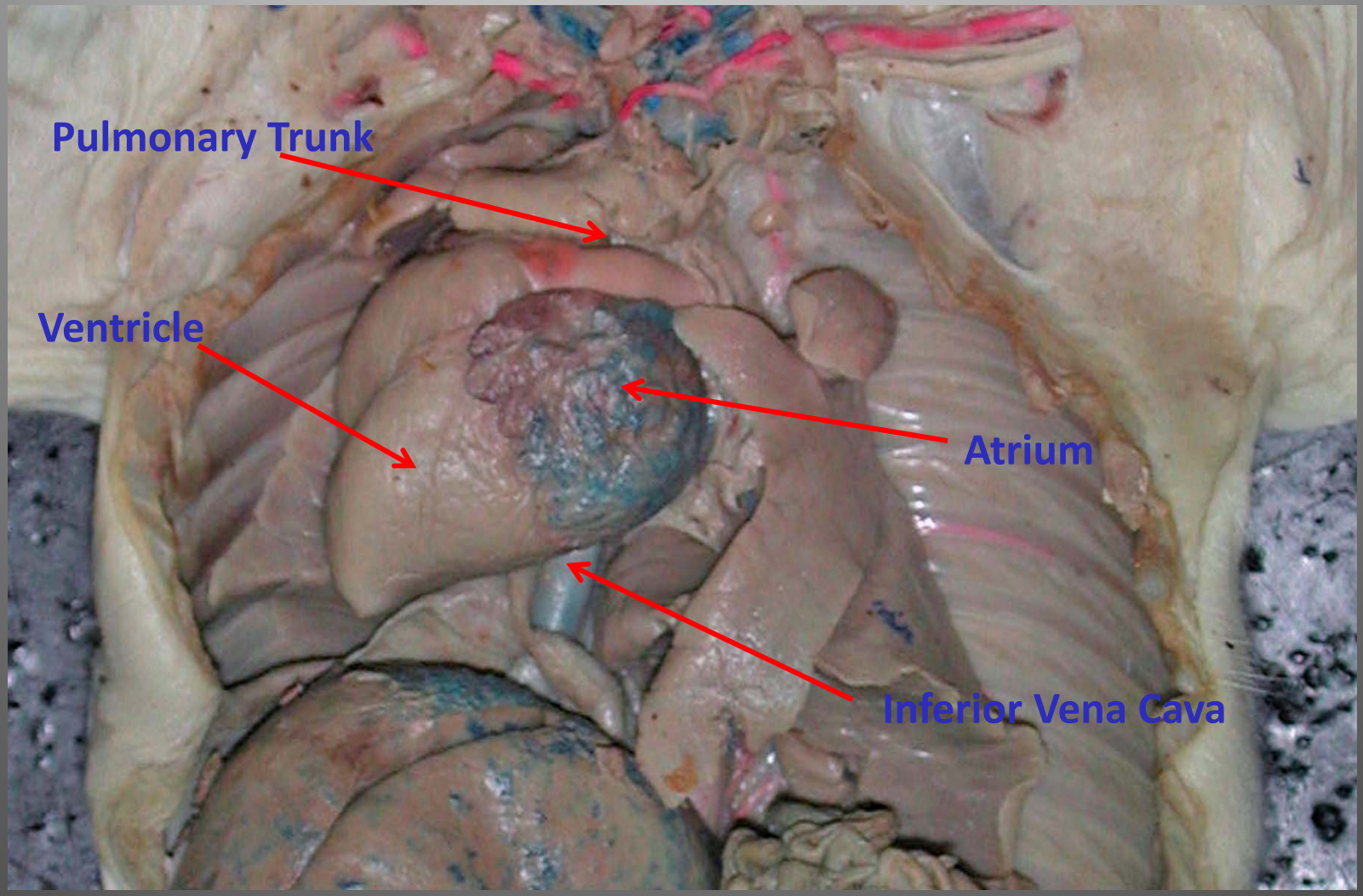
Thoracic Cavity

Name the organs:



Heart

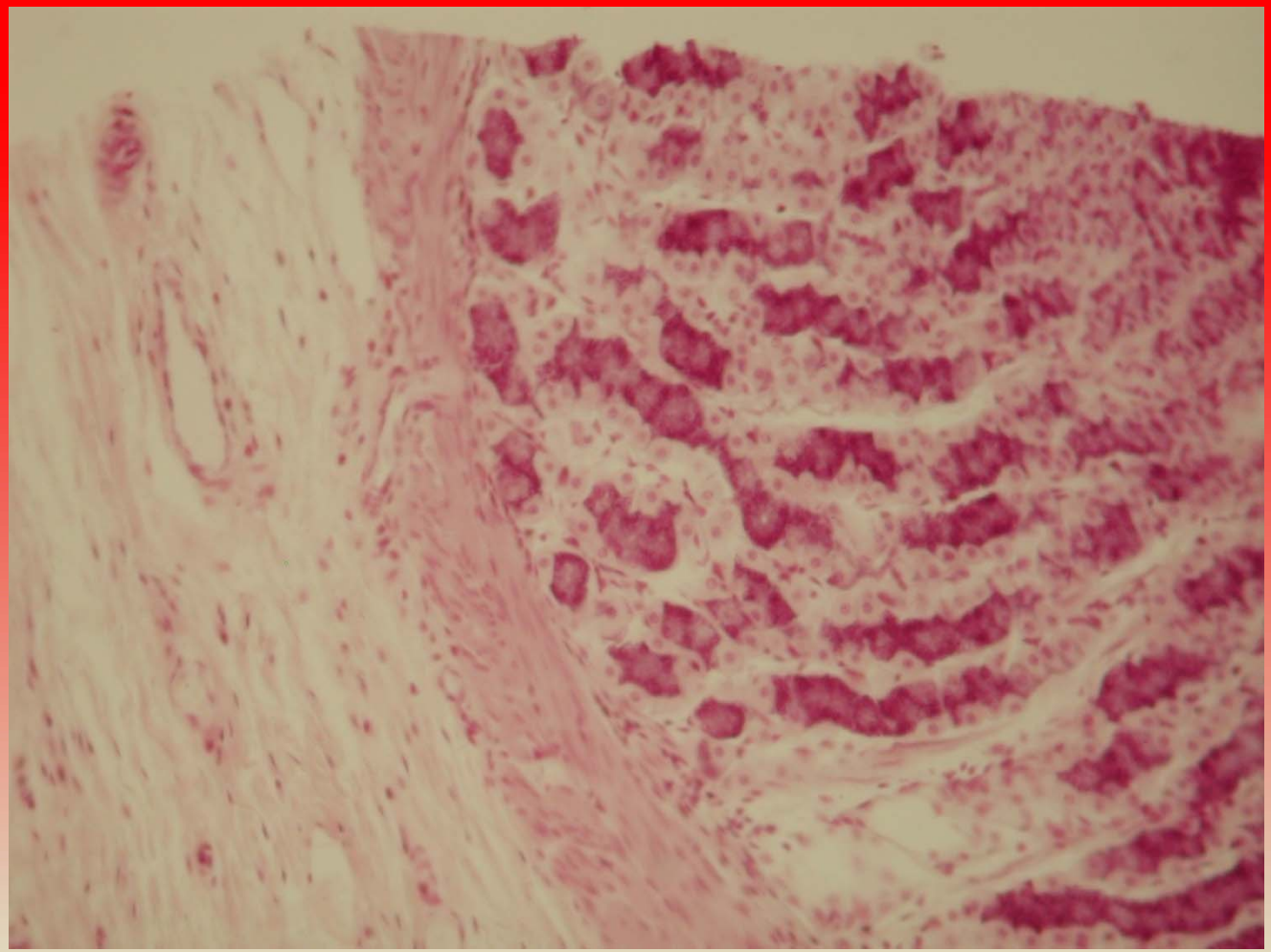
Name the organs:



HISTOLOGY

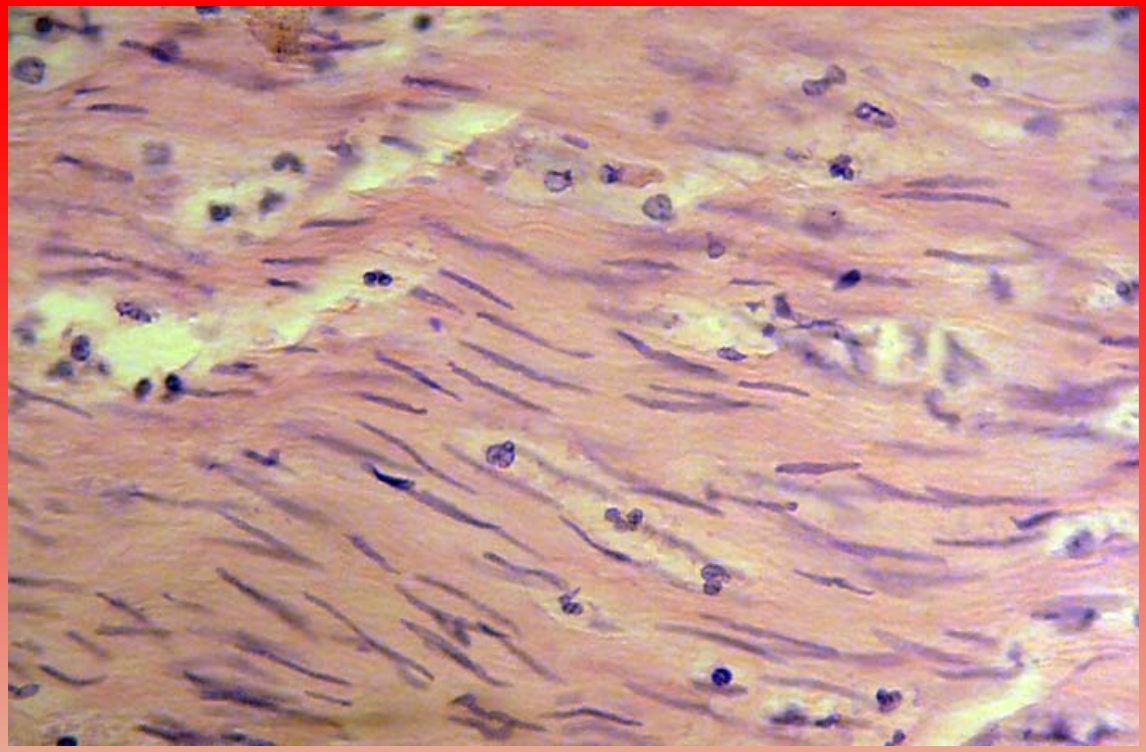
What tissue is this?

Stomach



What tissue is this?

Smooth Muscle



What tissue is this?

Frog Skin