

# Frog Dissection



# **AMPHIBIAN CHARACTERISTICS**

**Moist, thin skin without scales**

**Aquatic larva changes to terrestrial adult**

**Feet without claws**

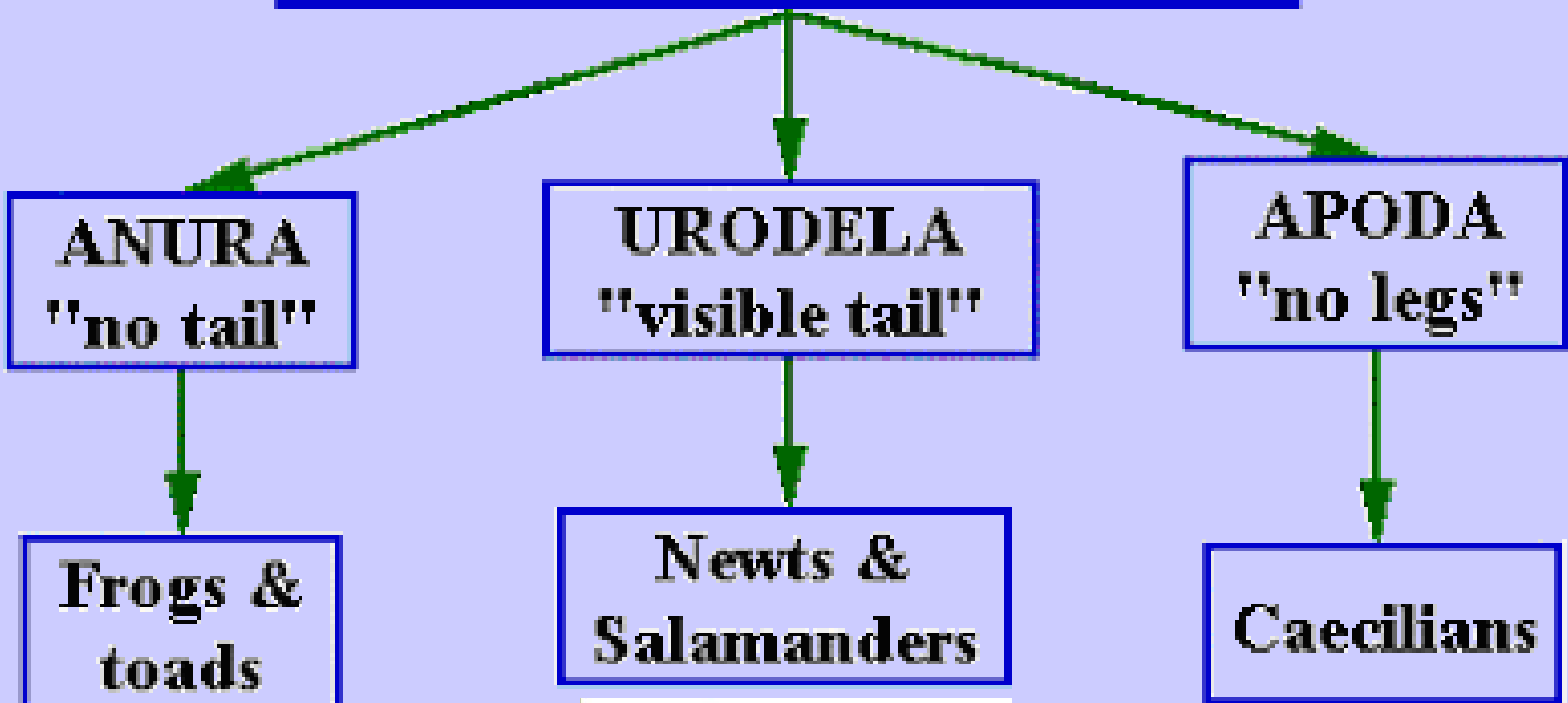
**Respiration with gills, lungs, skin, mouth**

**Closed 2 loop circulation**

**Ectothermic (cold blooded)**

**Eggs without shells or multicellular membranes**

# AMPHIBIANS



# FROG

LATIN meaning

**KINGDOM** ANIMALIA

**PHYLUM** CHORDATA

**SUBPHYLUM** VERTEBRATA “backbone”

**CLASS** AMPHIBIA “double life”

**ORDER** ANURA “without a tail”

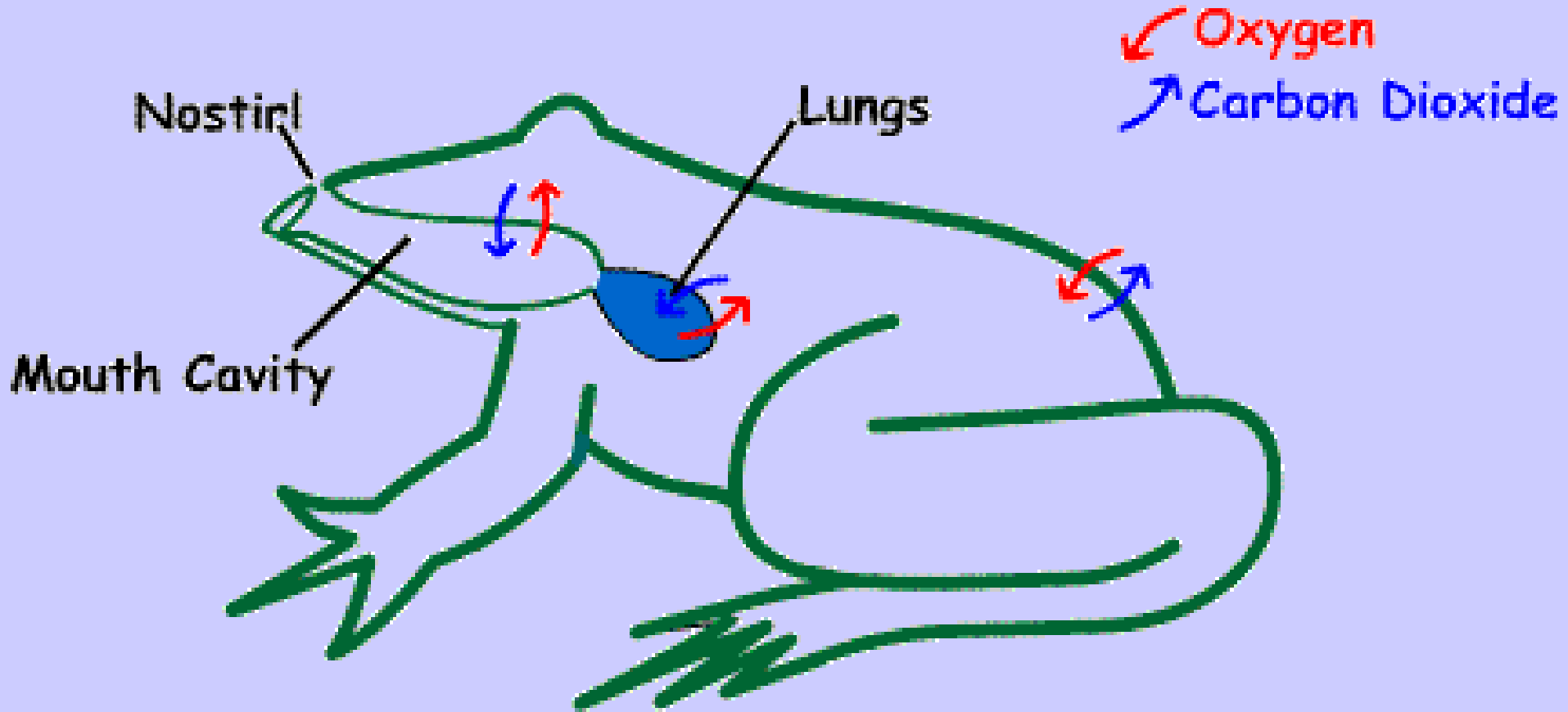
**Thin, moist skin – no scales**

**Mucous glands make it  
“slimy”**

**Camouflage- for protection**

**Some have poison glands**





**BREATHING THROUGH SKIN is called CUTANEOUS RESPIRATION**

# **ECTOTHERMIC**

## **“cold blooded”**

**Body temperature is dependent on  
surrounding environment**



# HIBERNATION/ ESTIVATION



**FAT stored in FAT BODIES provides energy**

Images from:

[http://www.enc.org/Classroom\\_Calendar/CC\\_Units/Unit\\_Images/185.jpg](http://www.enc.org/Classroom_Calendar/CC_Units/Unit_Images/185.jpg)

<http://www.reptilis.org/pyxi/image5.htm>



External  
Nares

Tympanic  
Membrane

Eye  
Nictitating membrane



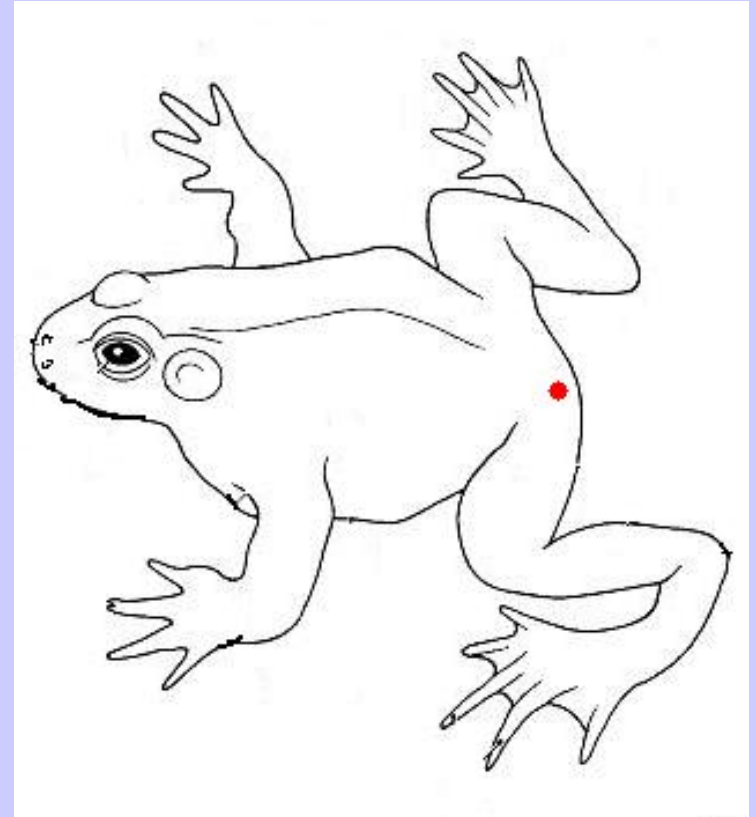
Webbing

**NO CLAWS**

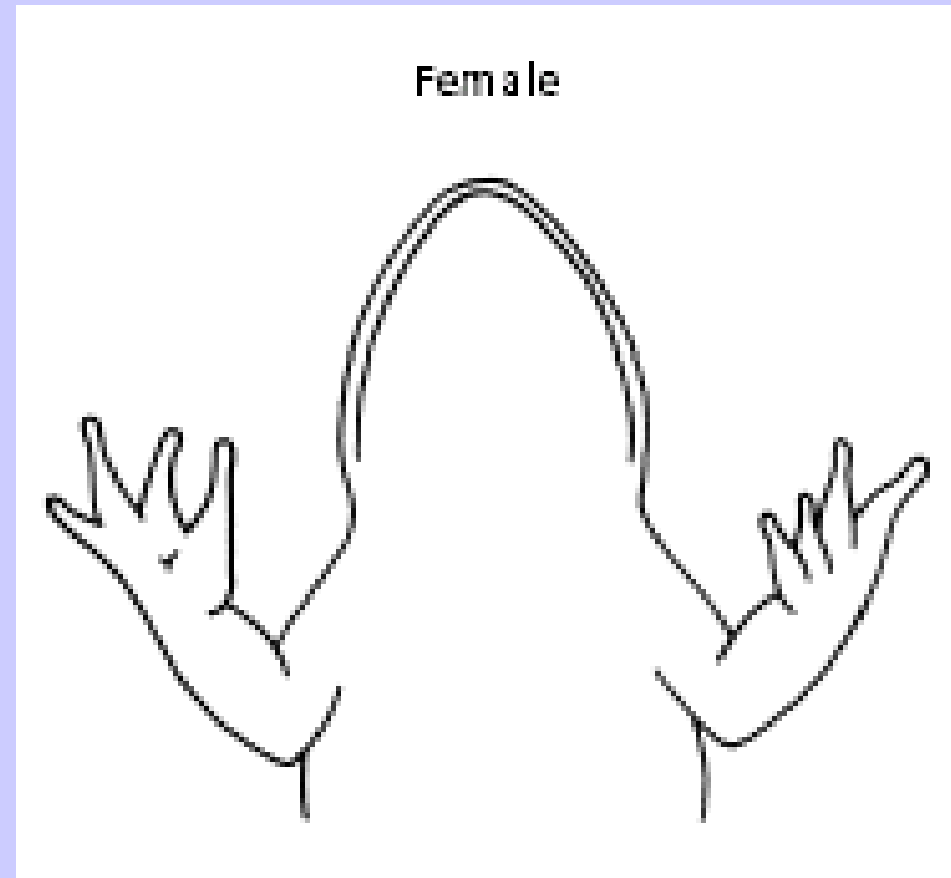
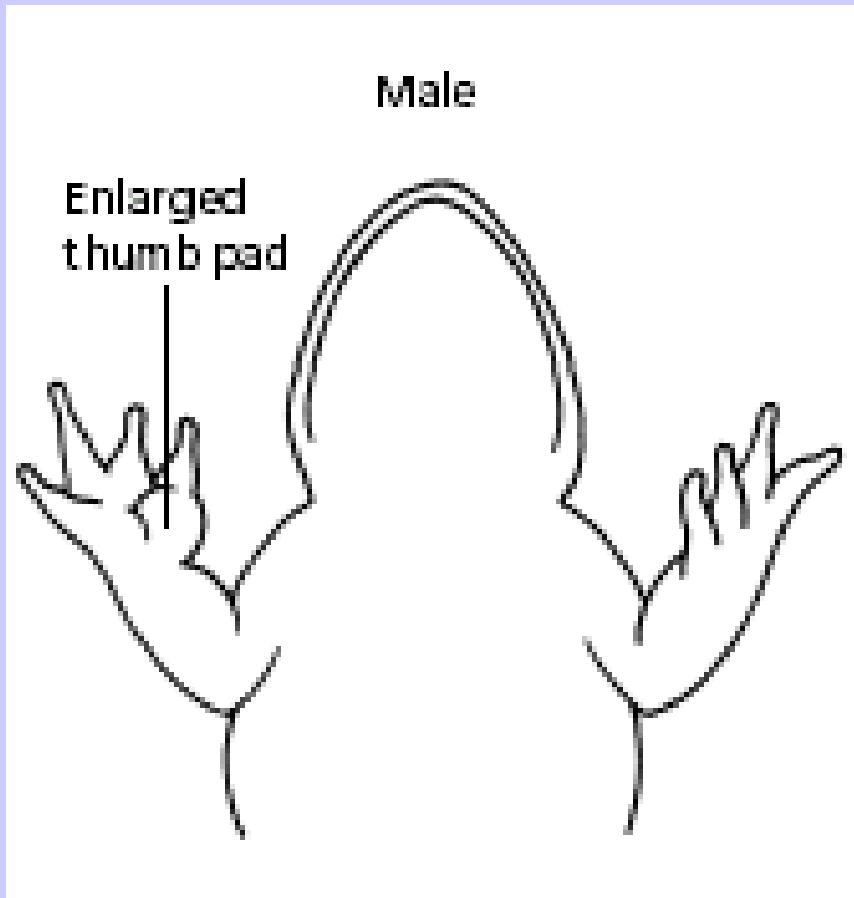
image from: <http://www.spc.cc.tx.us/biology/jmckinney/Studyimages/frog/frogdissectlist.html>

# EXIT OPENINGS

OPENING SHARED BY  
EXCRETORY,  
REPRODUCTIVE,  
& DIGESTIVE =  
VENT



# What sex is it?

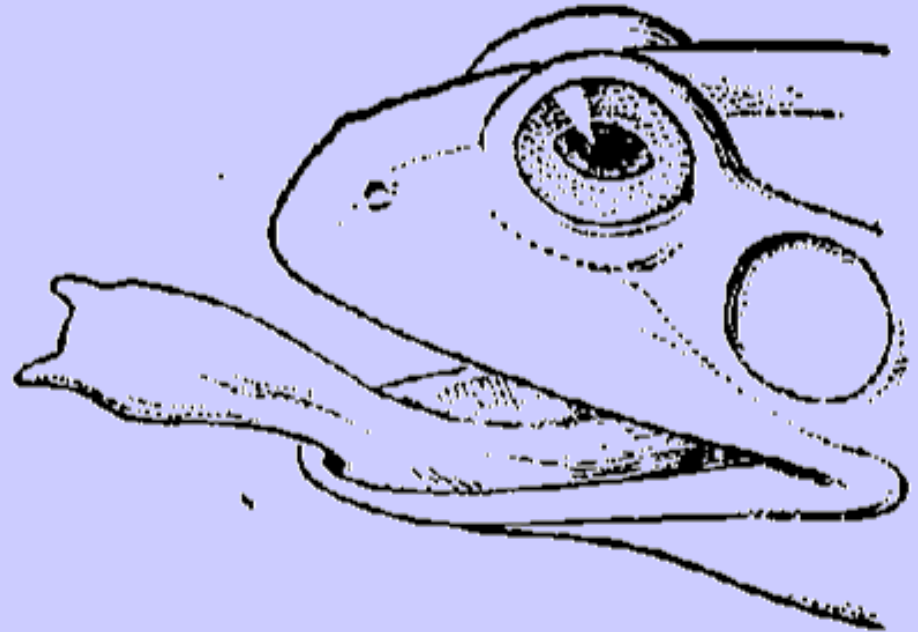


Images from:

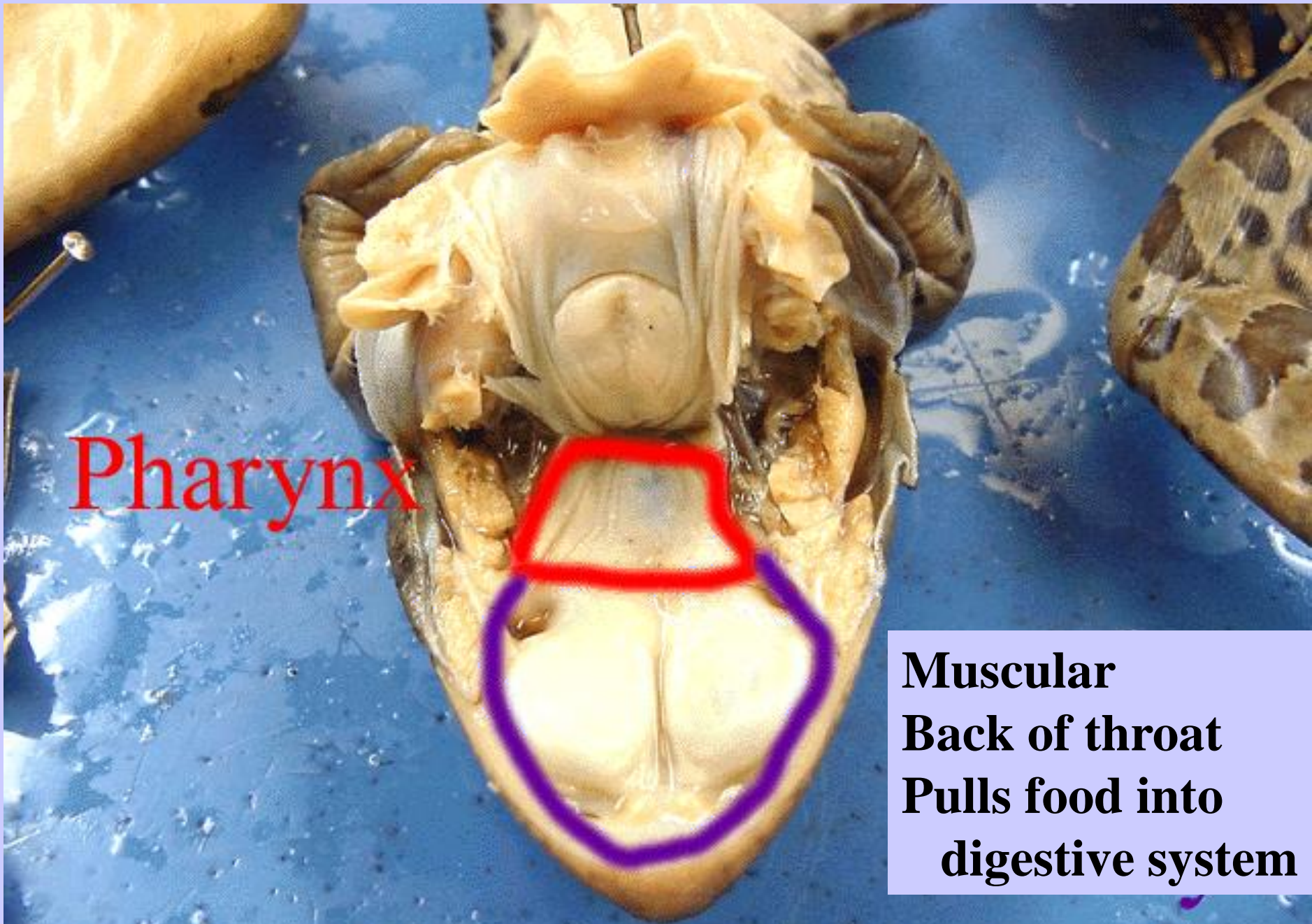
[http://sps.k12.ar.us/massengale/frog\\_dissection.htm](http://sps.k12.ar.us/massengale/frog_dissection.htm)



Image from:  
<http://www.animationlibrary.com>  
<http://www.geocities.com/animalbio/biology.htm>



**TONGUE** attached at front not back like yours!



Pharynx

**Muscular  
Back of throat  
Pulls food into  
digestive system**

image from: <http://www.spc.cc.tx.us/biology/jmckinney/Studyimages/frog/frogdissectlist.html>

**Connect ears  
to back of throat**

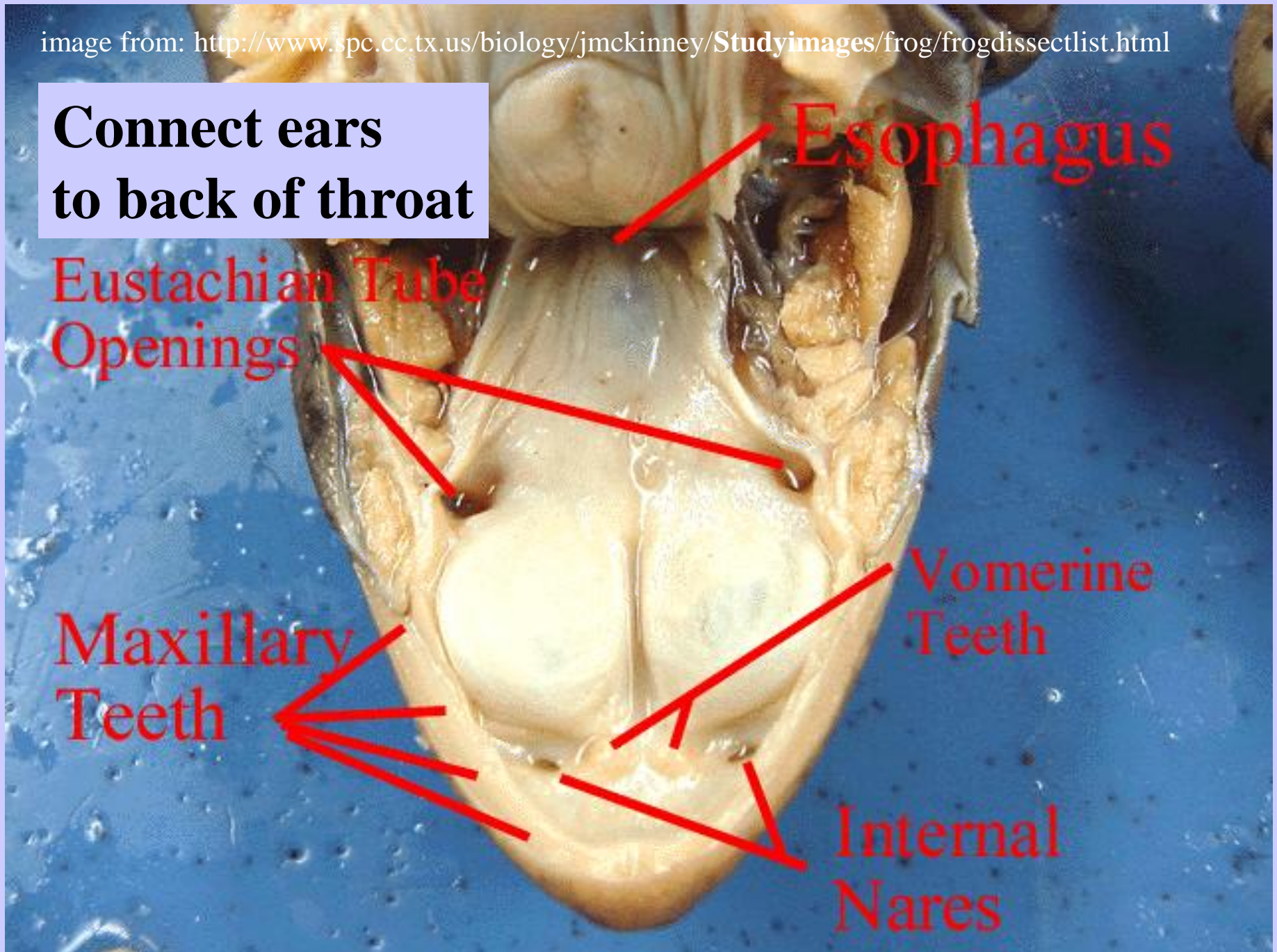
Eustachian Tube  
Openings

Esophagus

Maxillary  
Teeth

Vomerine  
Teeth

Internal  
Nares



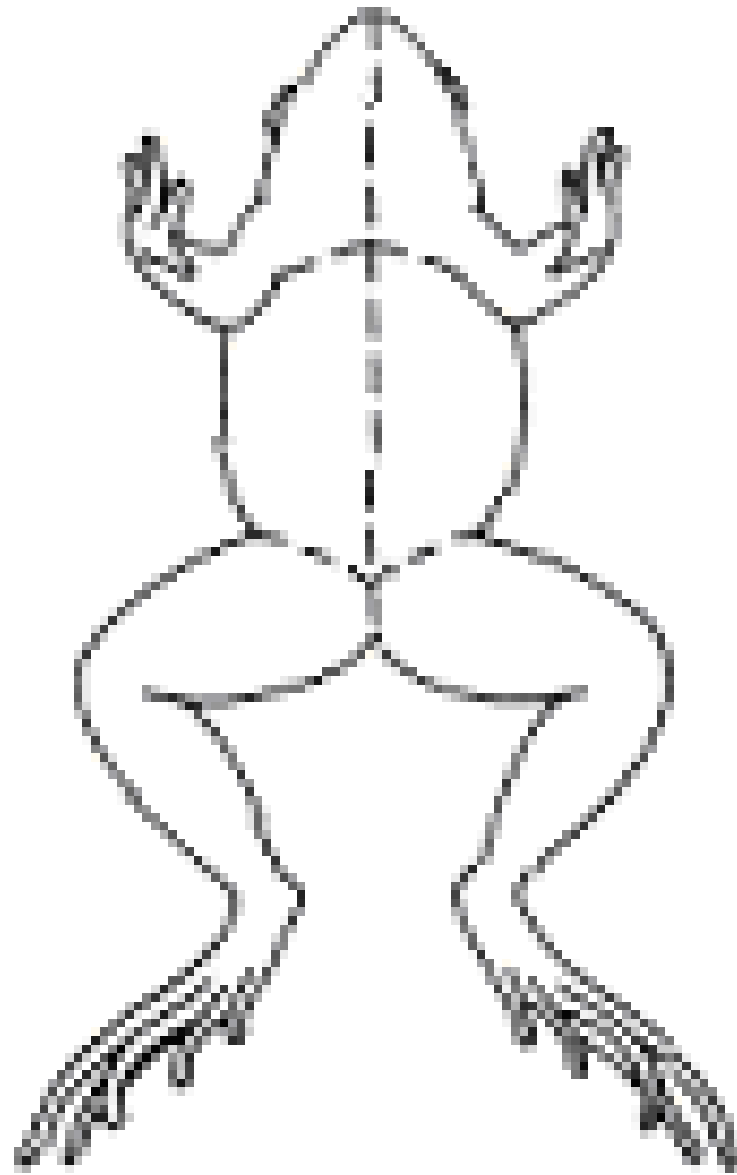


**Tongue**



**GLOTTIS**  
Opening to  
respiratory

**GULLET**  
Opening to digestive

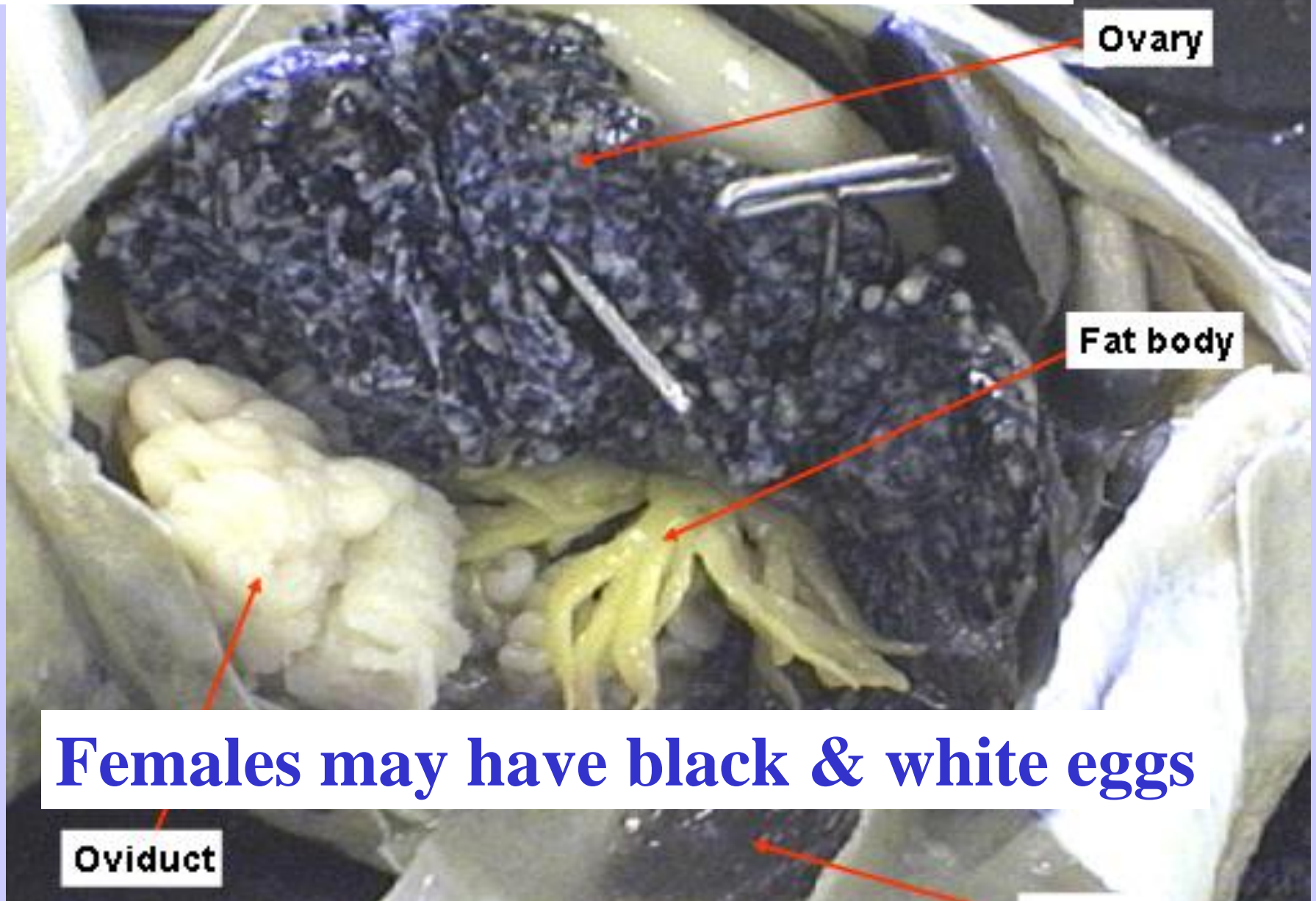


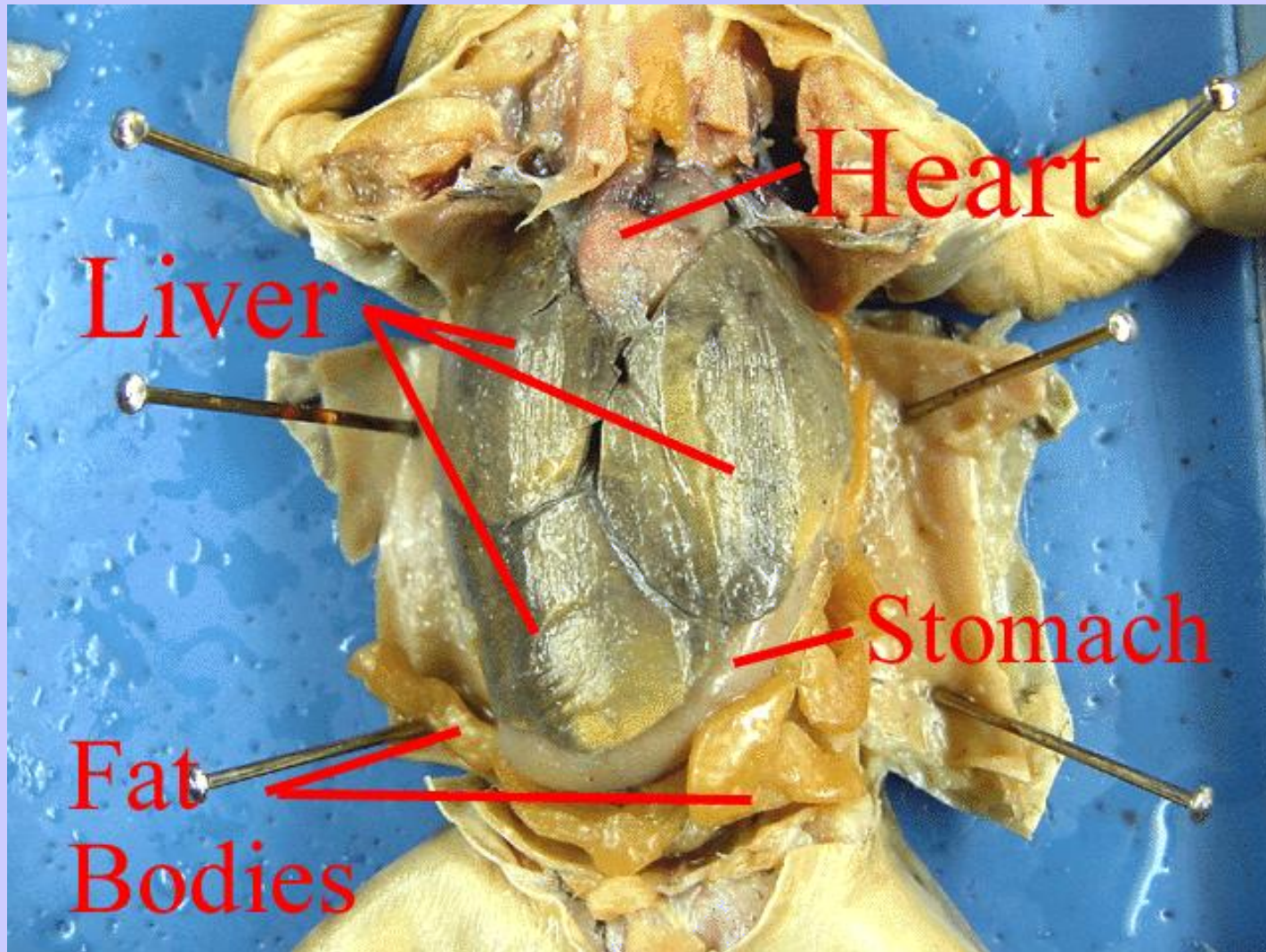
Incisions for Dissection

**Abdominal vein**

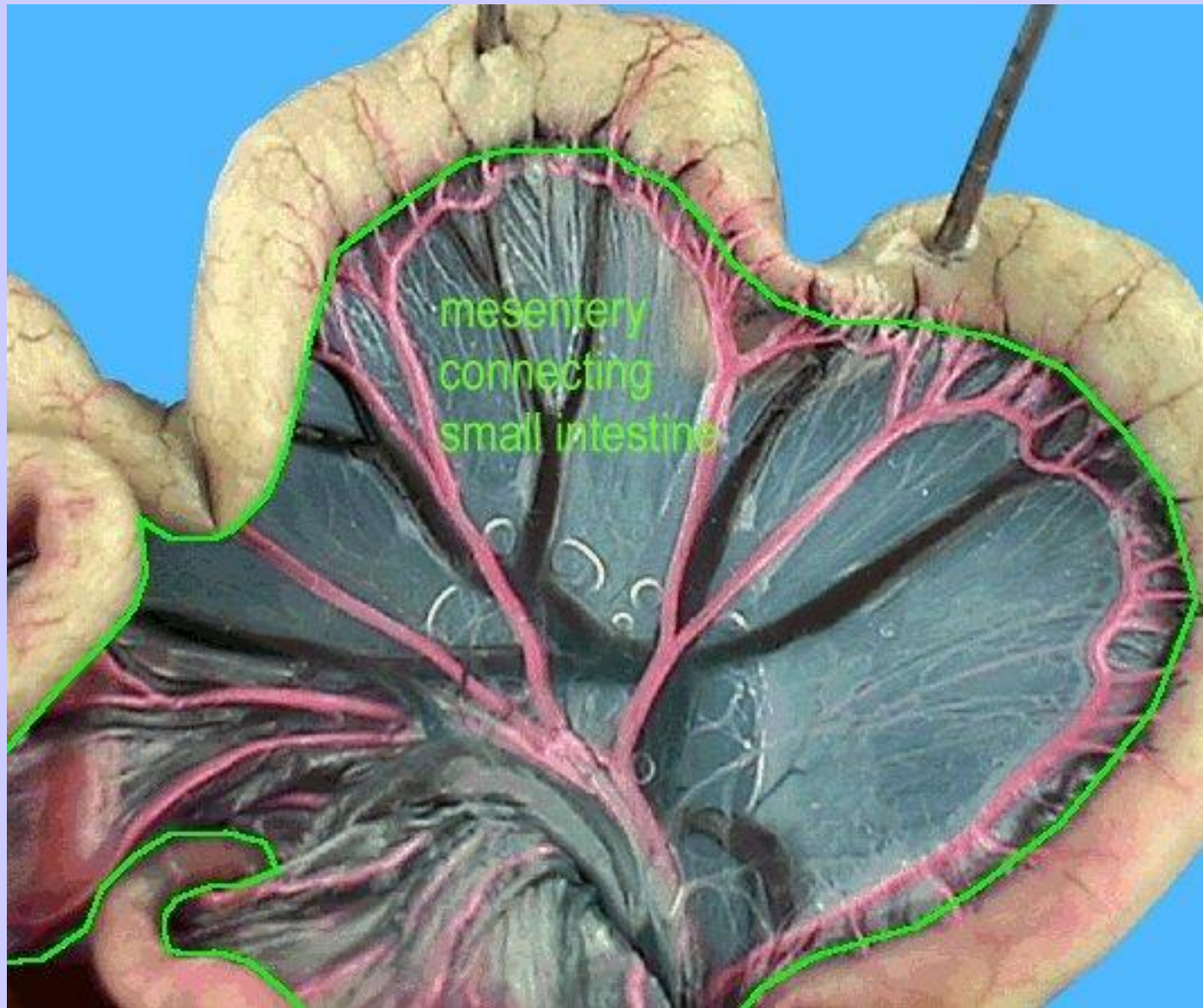


Image from; [http://faculty.clintoncc.suny.edu/faculty/Michael.Gregory/files/Bio%20102/Bio%20102%20Laboratory/frog%20dissection/frog%20dissection\\_files/frame.htm](http://faculty.clintoncc.suny.edu/faculty/Michael.Gregory/files/Bio%20102/Bio%20102%20Laboratory/frog%20dissection/frog%20dissection_files/frame.htm)





**Pericardial membrane around heart**  
**Mesentery holds intestines together**



mesentery  
connecting  
small intestine

**Mesentery holds intestines together**

# FAT BODIES

**Store fat for  
energy during**

**Hibernation**

**Estivation**

**Breeding**



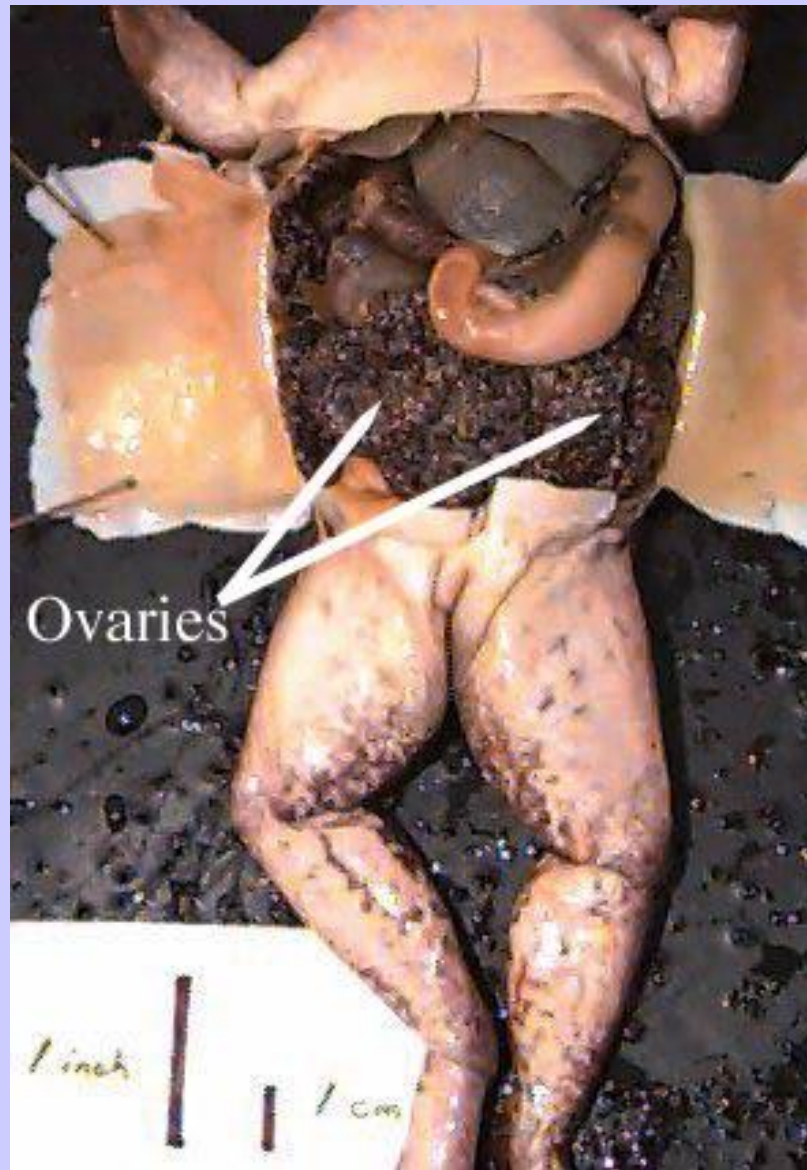


Image from: <http://step.sdsc.edu/projects95/Frog.Dissection/index.html>



Image from: <http://step.sdsc.edu/projects95/Frog.Dissection/index.html>





## **PYLORIC SPHINCTER**

**CONTROLS** passage of food from stomach  
into duodenum (intestine)

# Gall Bladder

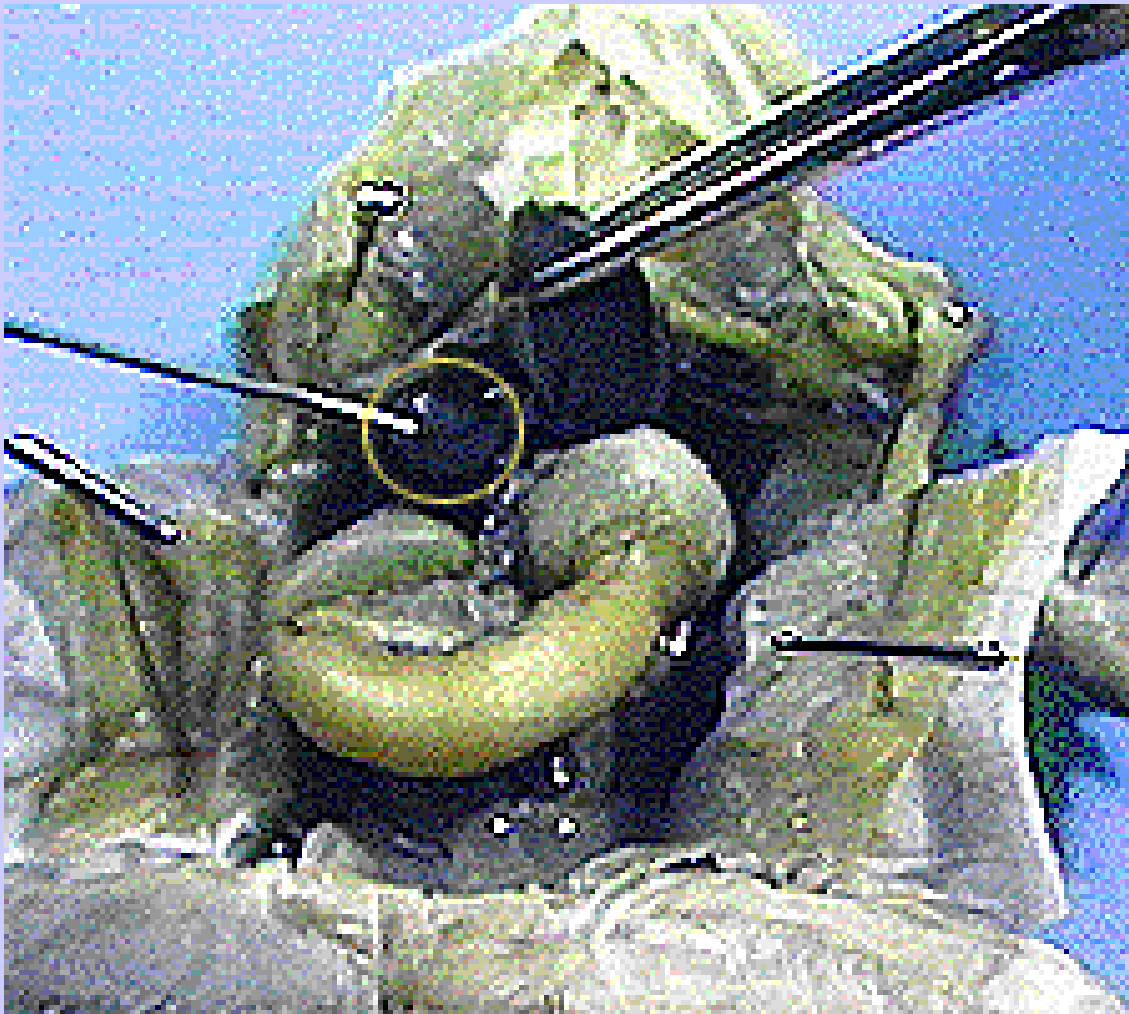


Image from: <http://school.discovery.com/quizzes6/muskopf/frog.html>

# **STOMACH:**

**Make acid and digestive enzymes**

**Start digestion (grind up food)**

# **LIVER:**

**Make bile**

**Store glycogen**

**Store vitamins**

**Process toxins (including  
nitrogen waste) for kidneys**

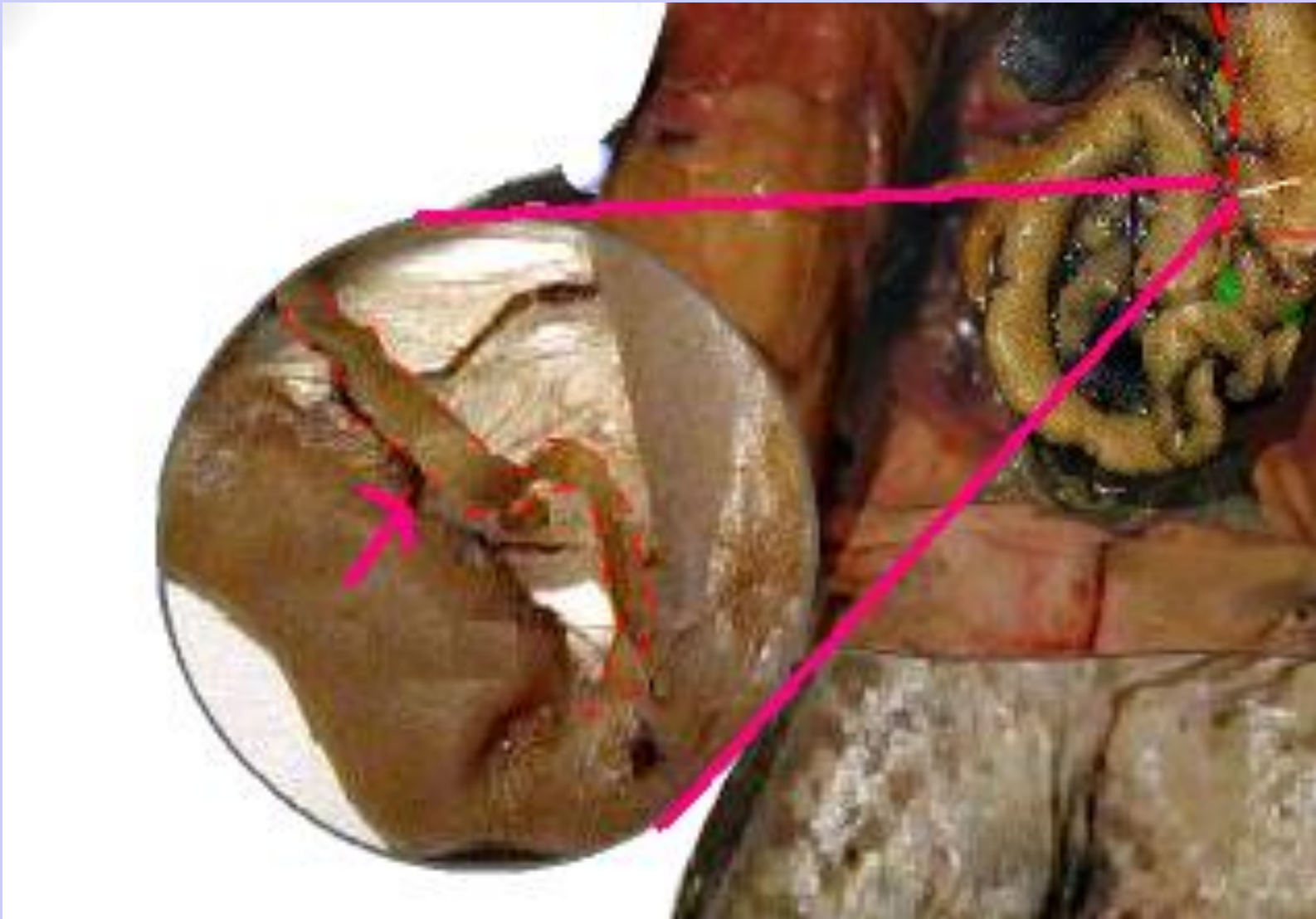
# **GALL BLADDER**

**Store bile**

# PANCREAS



# Pancreas (enlarged)



# **PANCREAS:**

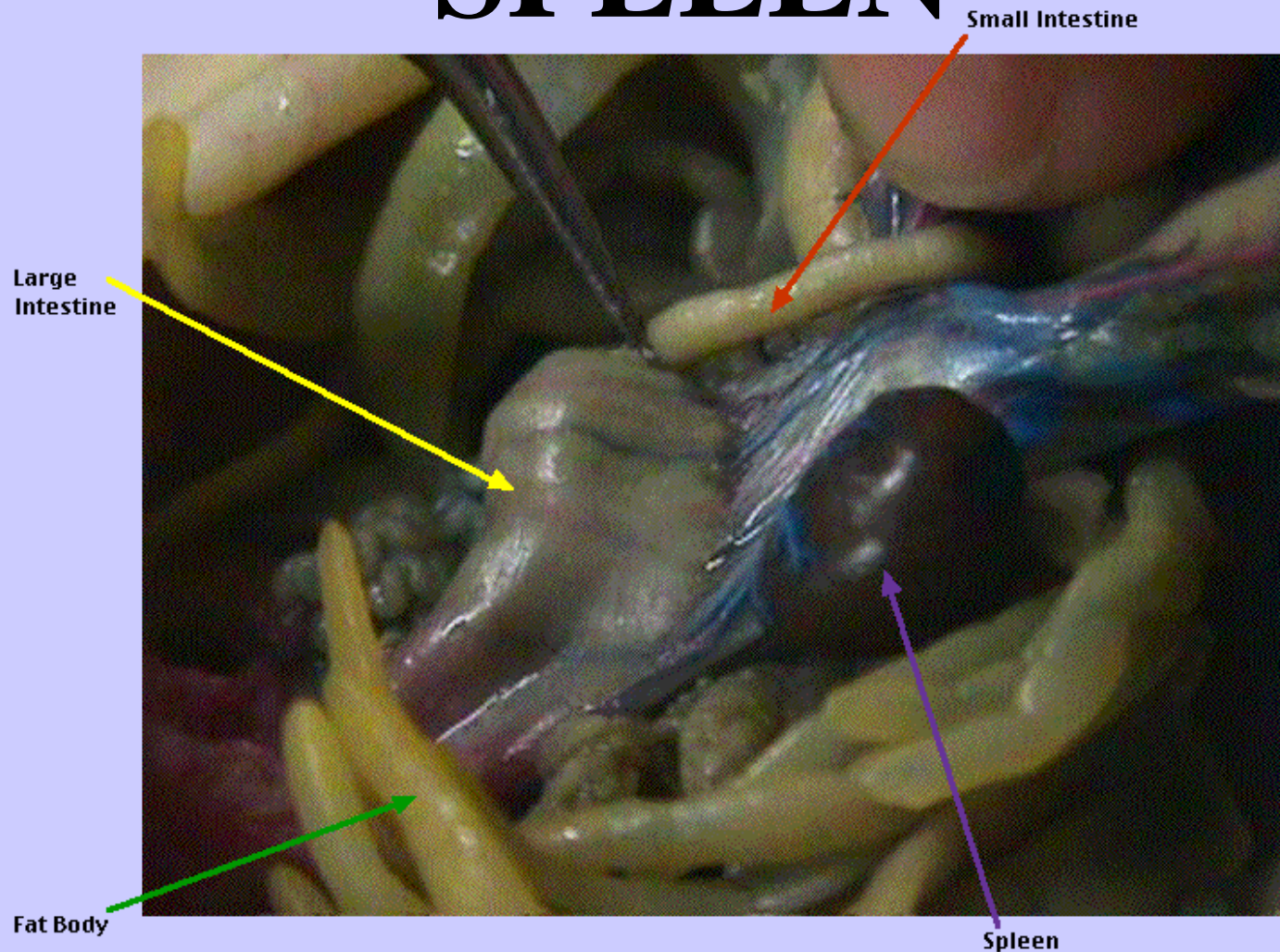
**Makes TRYPSIN, INSULIN, GLUCAGON**

**TRYPSIN- breaks down proteins**

**INSULIN- tells cells to store glucose from  
bloodstream as glycogen**

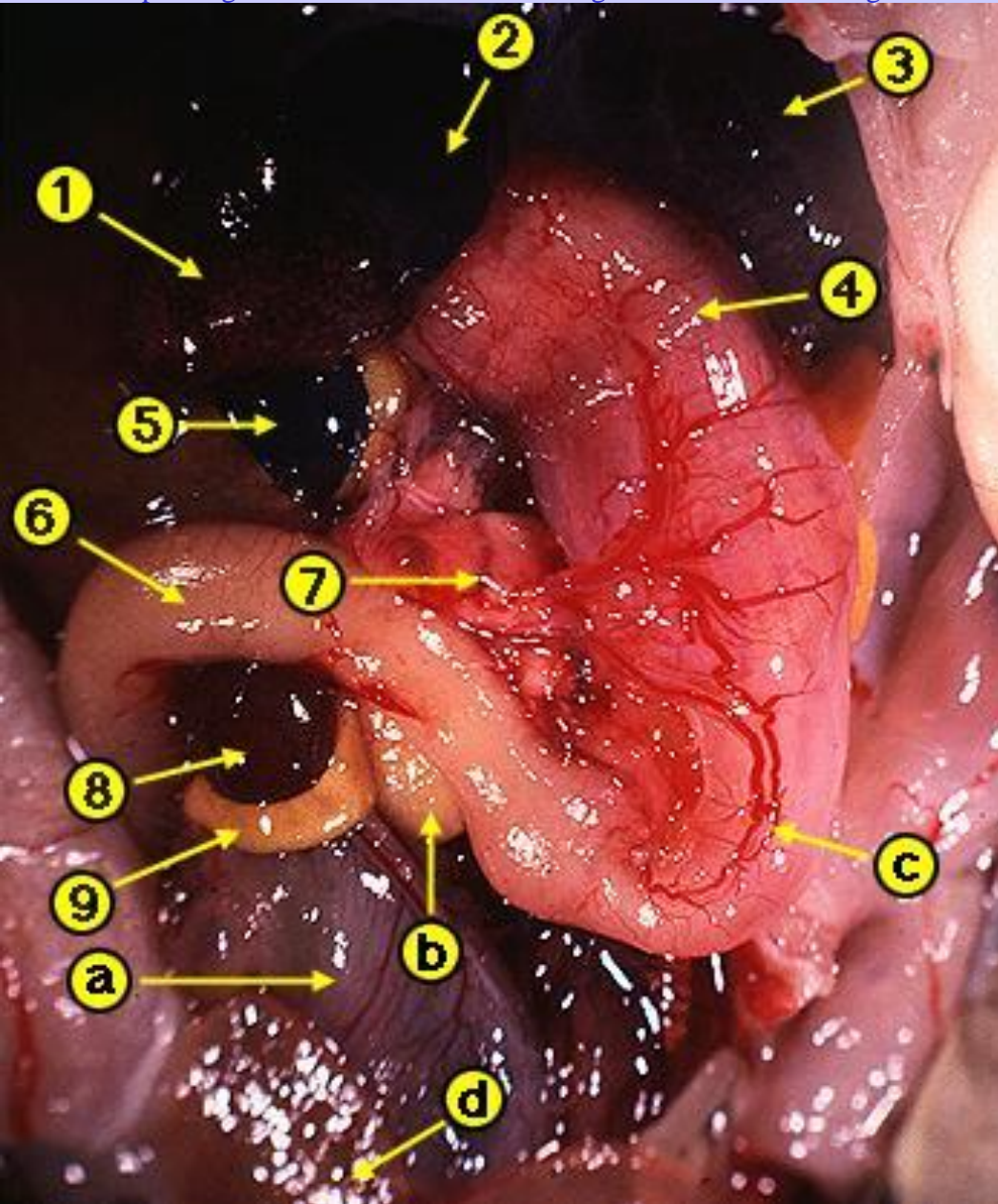
**GLUCAGON- tells cells to release stored  
glucose to blood stream**

# SPLEEN



**Produces and stores new RBC's and processes old worn out ones**





# SMALL INTESTINE

## DUODENUM

Receives trypsin and bile;  
finishes digestion

## ILEUM

Absorbs nutrients

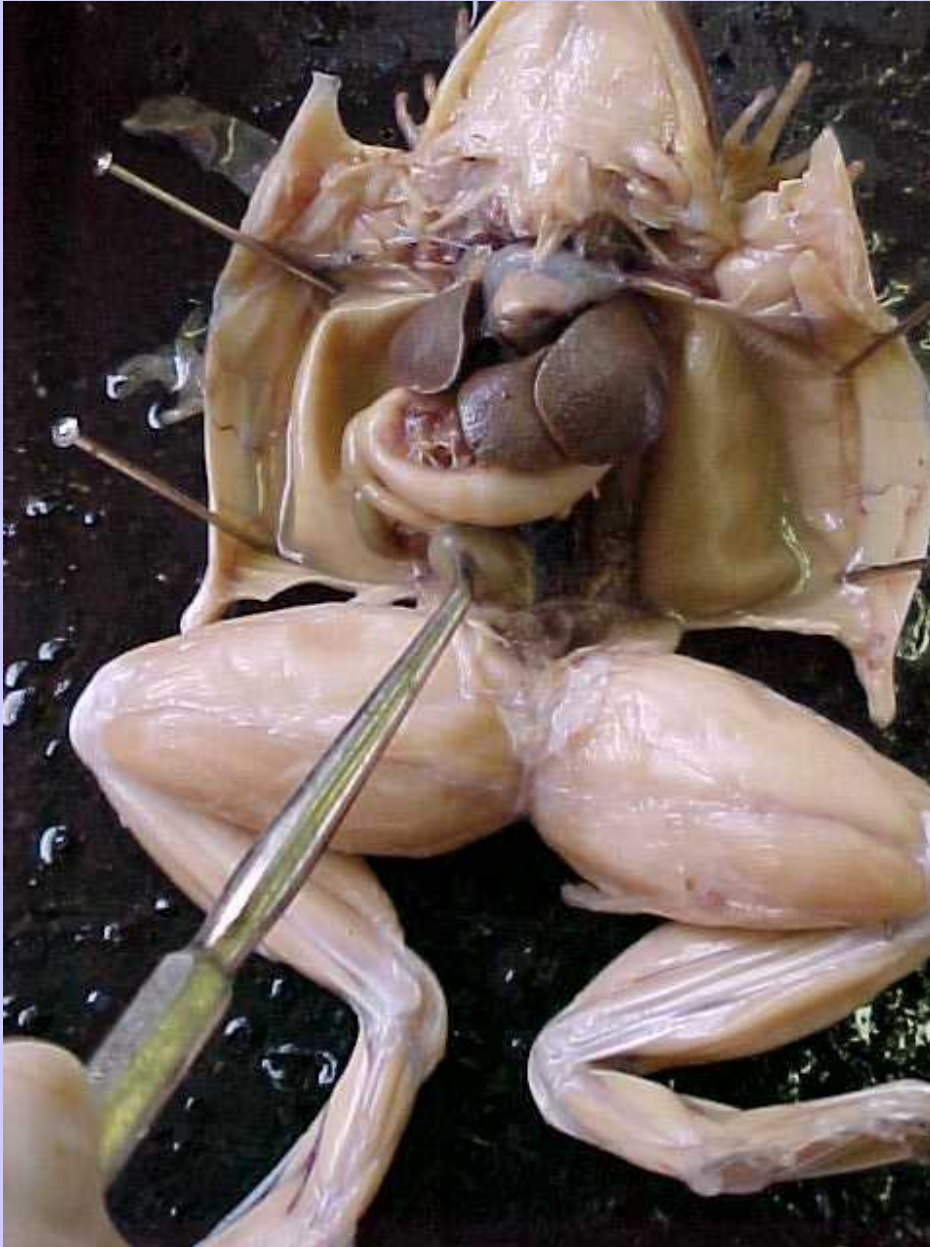
## VILLI

Increase surface area



# LARGE INTESTINE

**Removes water from  
digestive waste;  
concentrates feces**



# 10 Body Systems :

## EXCRETORY

Get rid of nitrogen waste made by cells

Nitrogen waste has different chemical forms:

### AMMONIA

**MOST TOXIC**

**FISH**

### UREA

made from  
ammonia by  
liver

**HUMANS**

**AMPHIBIANS**

### URIC ACID

**LEAST TOXIC**  
needs the least  
water to dilute

**BIRDS, REPTILES**

# **ALL WASTE is NOT THE SAME!**

## **DIGESTIVE** waste-

**left over from undigested food**

**travels through digestive system**

**leaves through digestive system as feces**

## **EXCRETORY** waste-

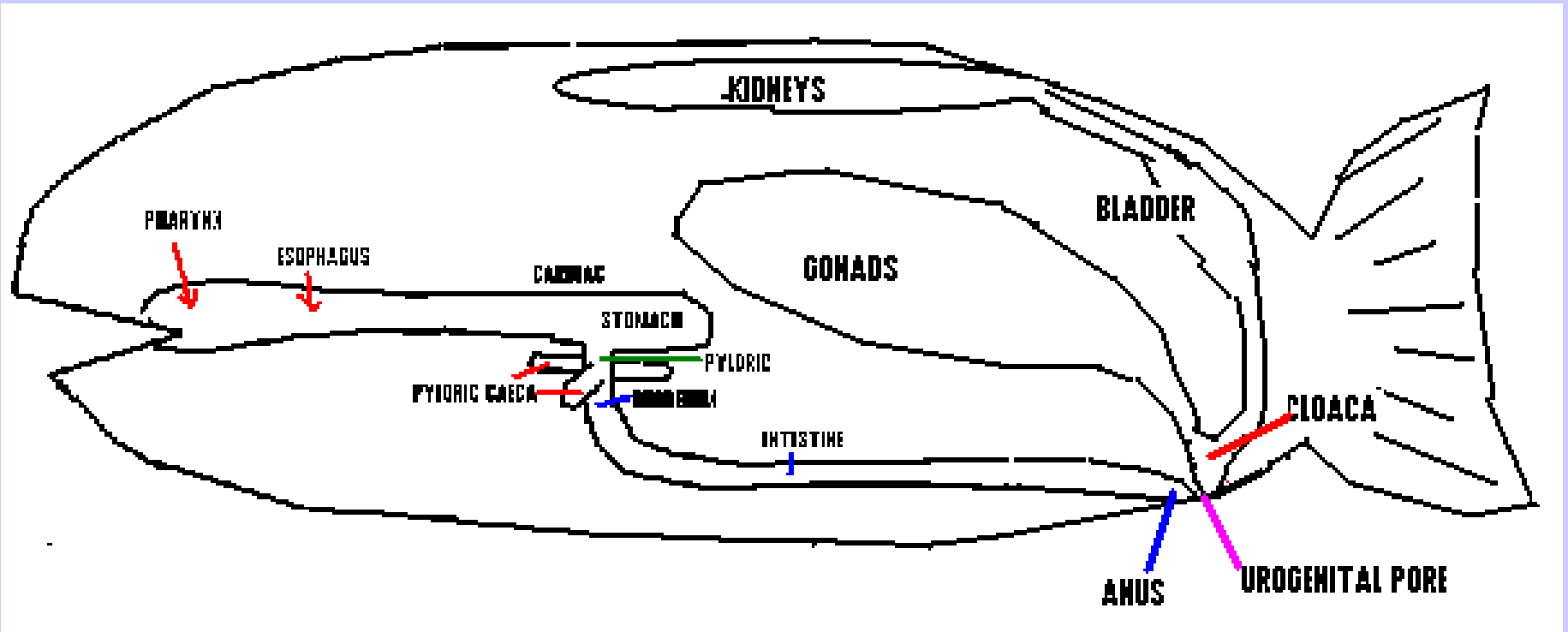
**(Also called NITROGEN WASTE)**

**made by cells from break down of proteins**

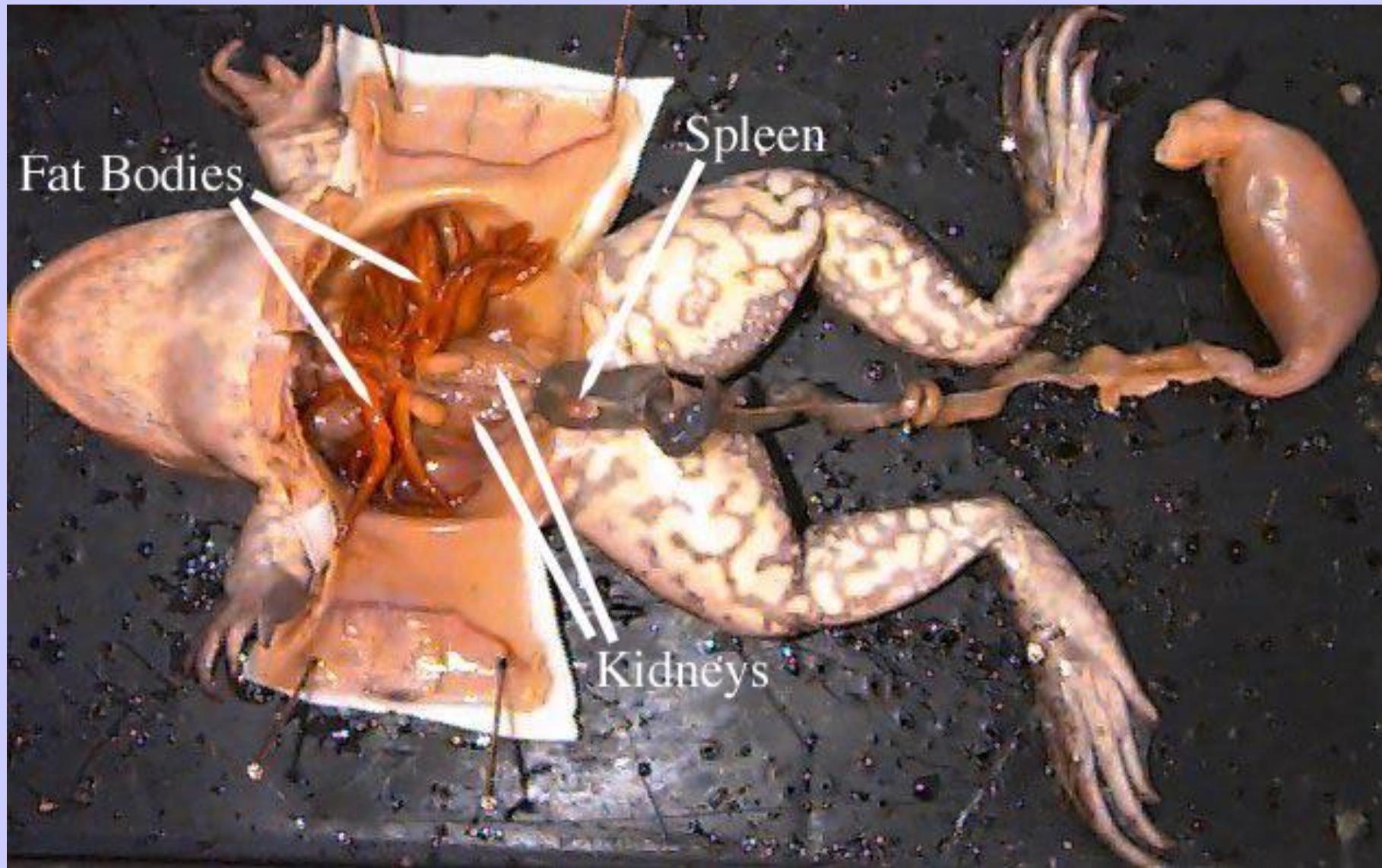
**travels through blood stream**

**leaves through excretory system as**

**ammonia, urea, or uric acid**



# **KIDNEYS-** Remove nitrogen waste from blood and dilute it with water to make urine; osmoregulation



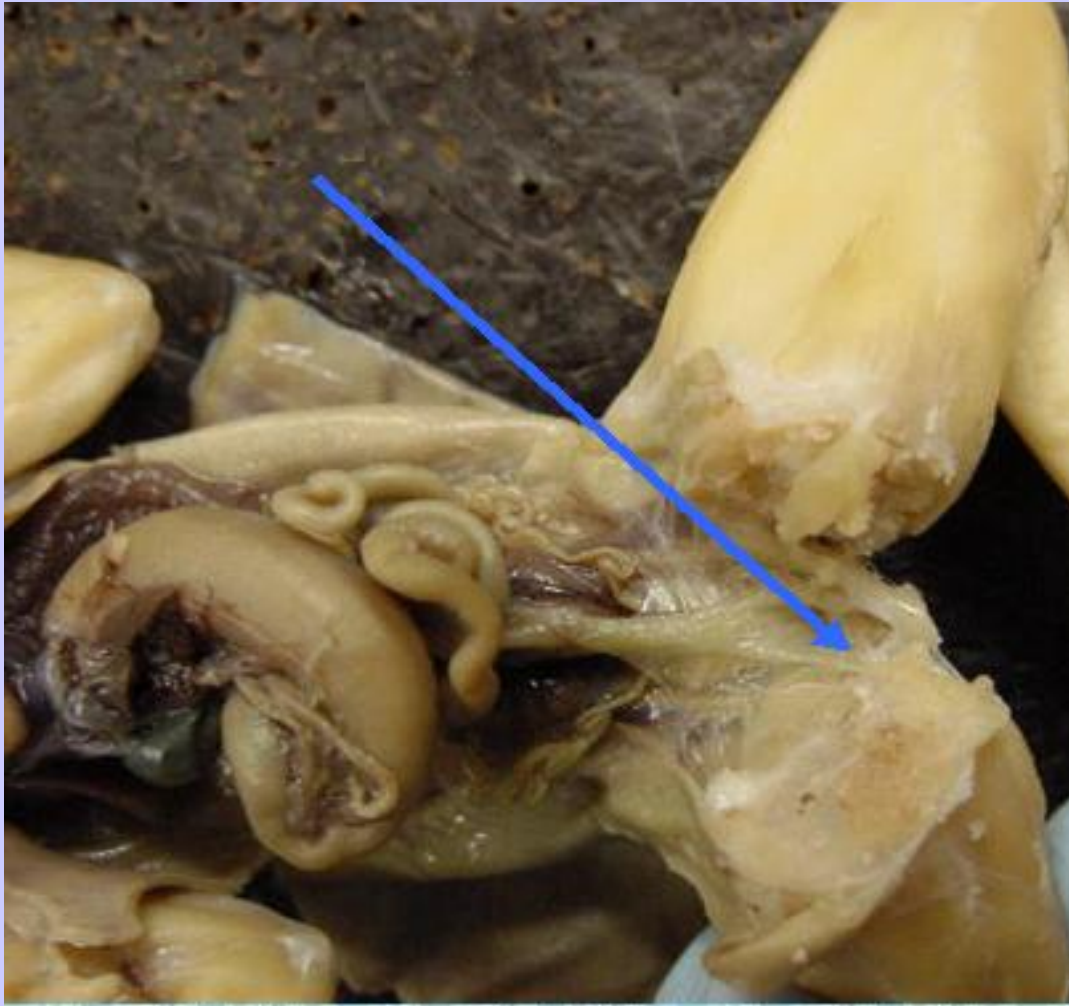
# URINARY BLADDER



**STORES URINE  
MADE BY KIDNEYS**

**LARVAE (Tadpoles)  
Excrete AMMONIA like fish**

**Adult frogs excrete  
UREA to conserve water**



# **CLOACA**

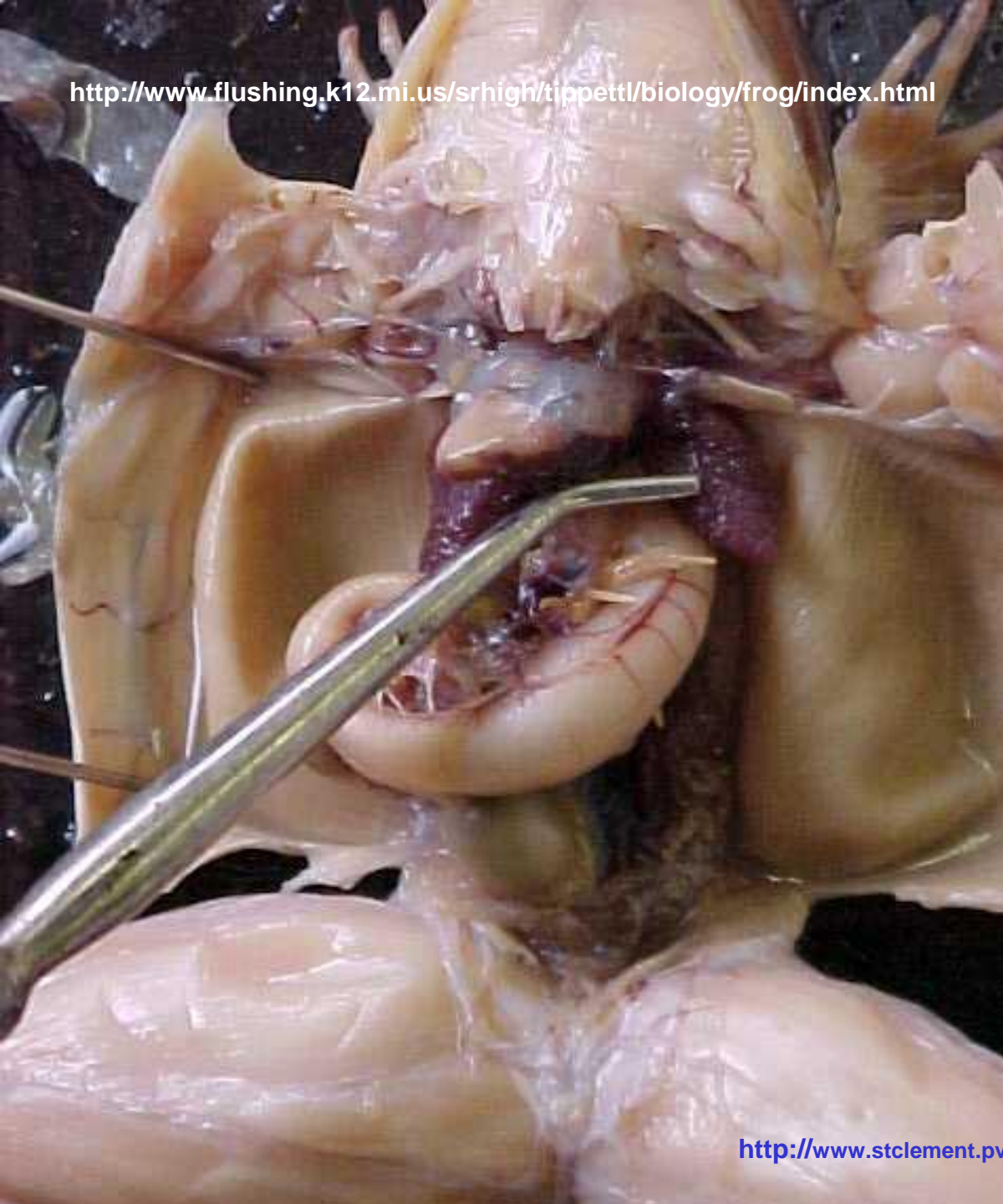
**DIGESTIVE**

**EXCRETORY**

**REPRODUCTIVE**

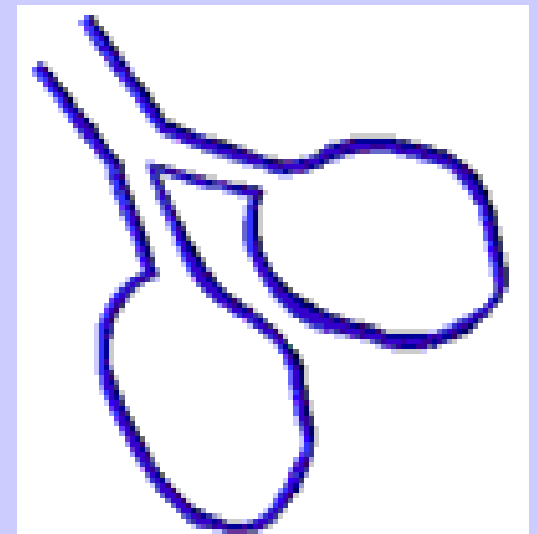


<http://www.flushing.k12.mi.us/srhigh/tippettl/biology/frog/index.html>

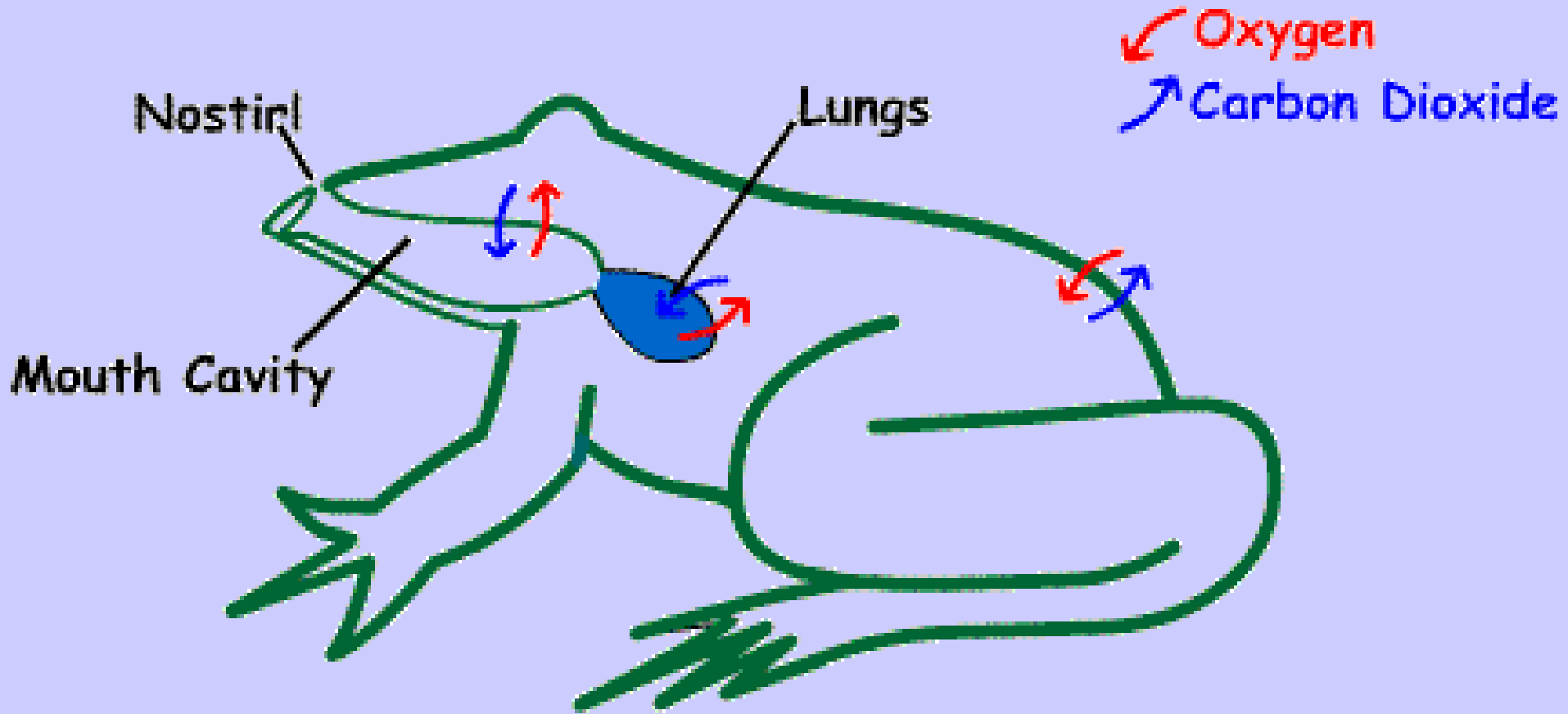


# LUNGS:

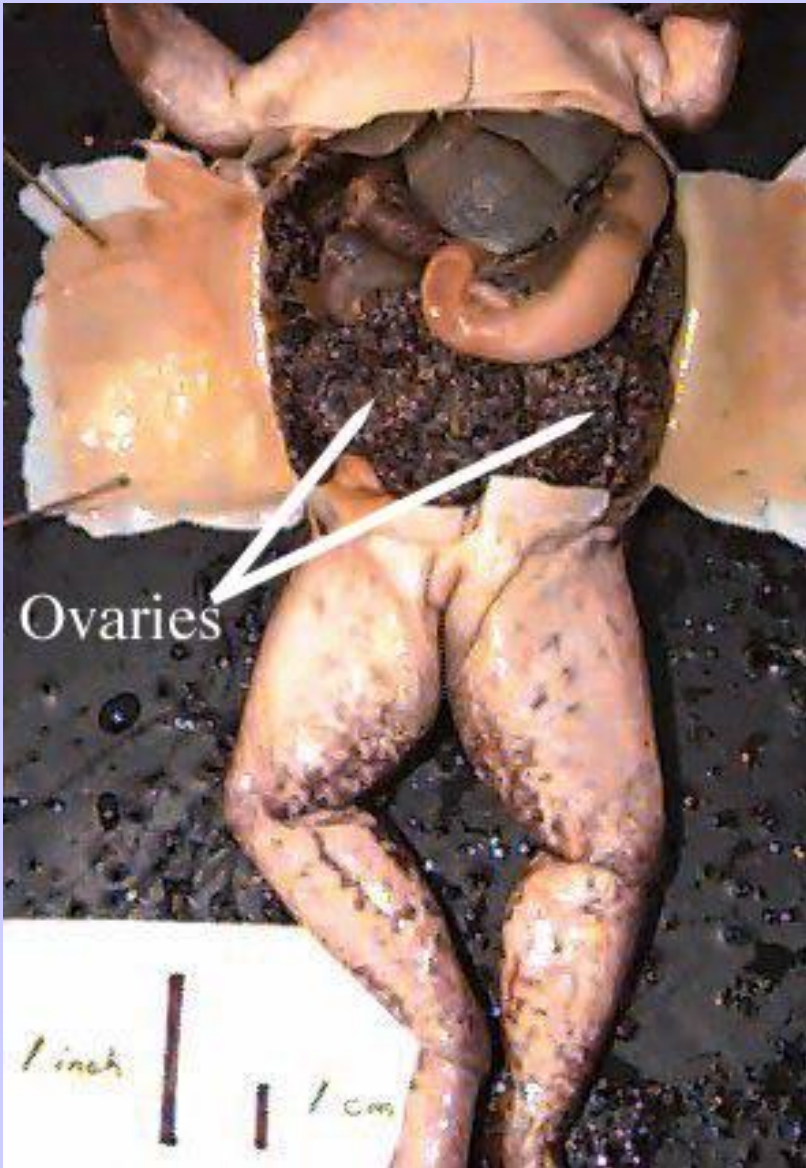
## GAS EXCHANGE



<http://www.stclement.pvt.k12.il.us/studentWeb/science98/GarrittPatM/alveoli.gif>



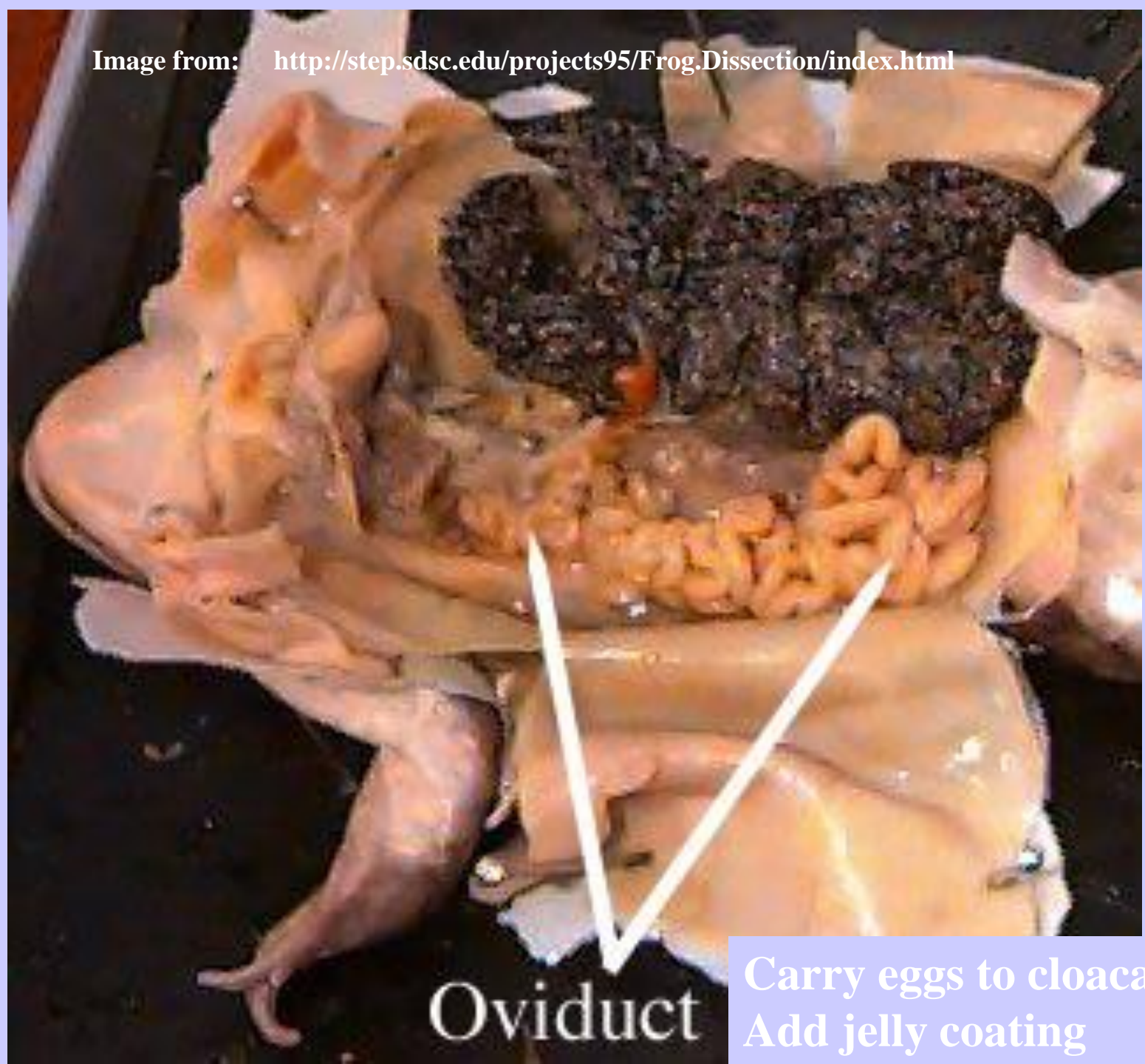
**BREATHING WITH LUNGS is called  
PULMONARY RESPIRATION**



# OVARIES

## Make eggs

Image from: <http://step.sdsc.edu/projects95/Frog.Dissection/index.html>



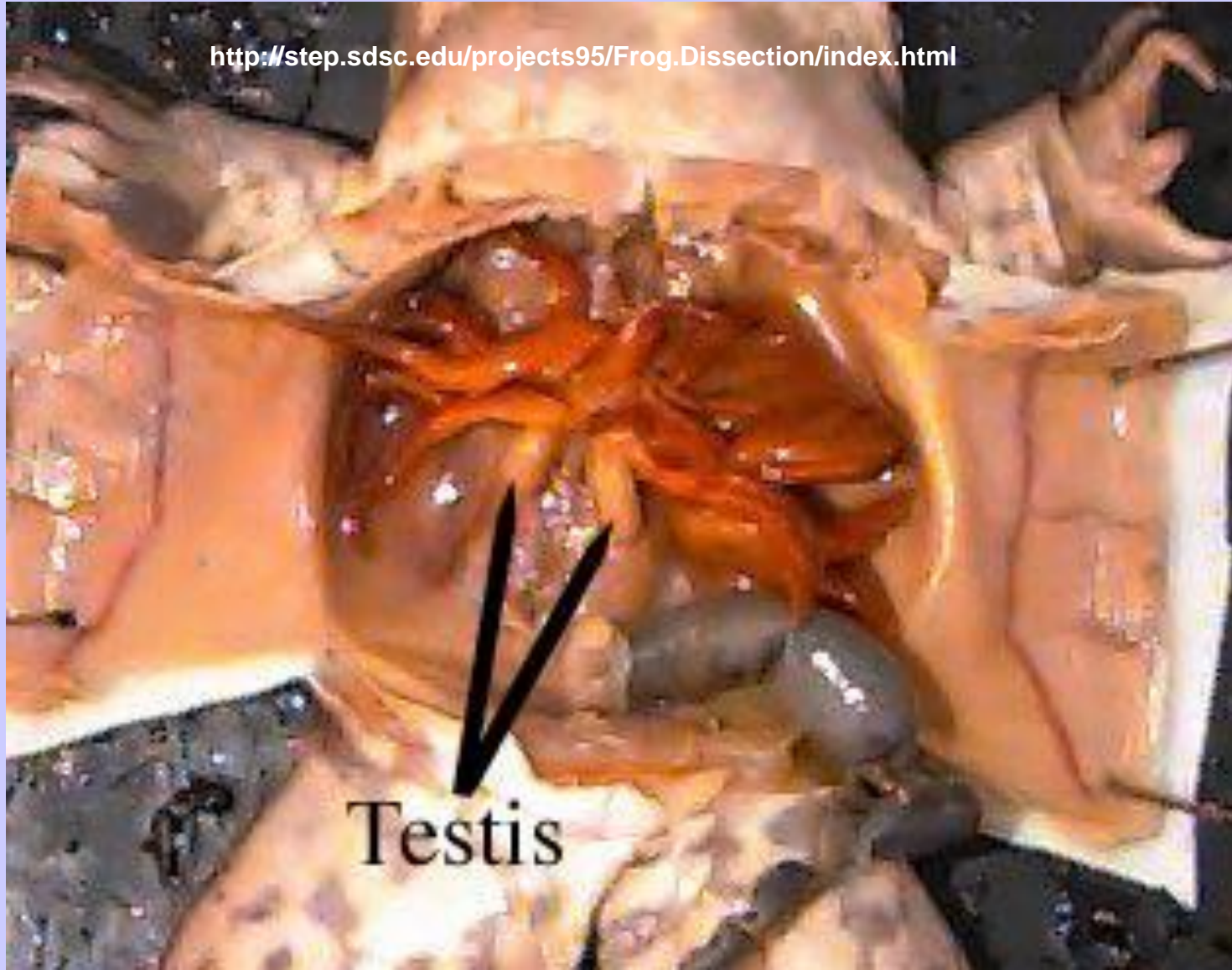
Oviduct

Carry eggs to cloaca  
Add jelly coating

# TESTES

MAKE SPERM

<http://step.sdsc.edu/projects95/Frog.Dissection/index.html>



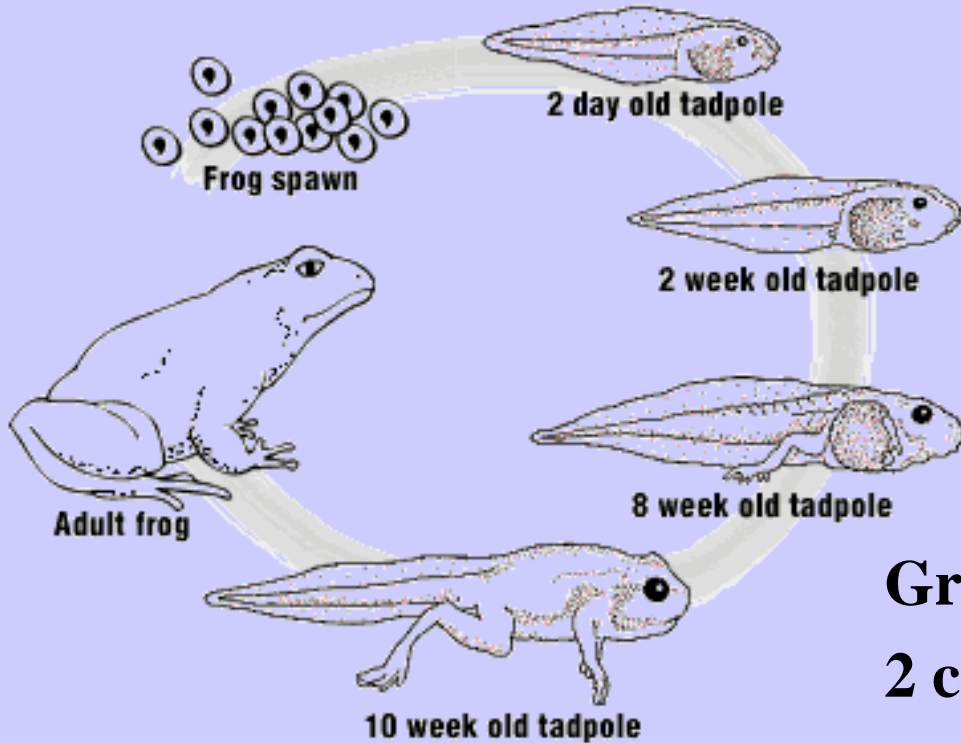
Testis

# TESTES

# KIDNEY



# INDIRECT DEVELOPMENT



**Grow legs; Lose tail**

**2 chambers → 3 chambers**

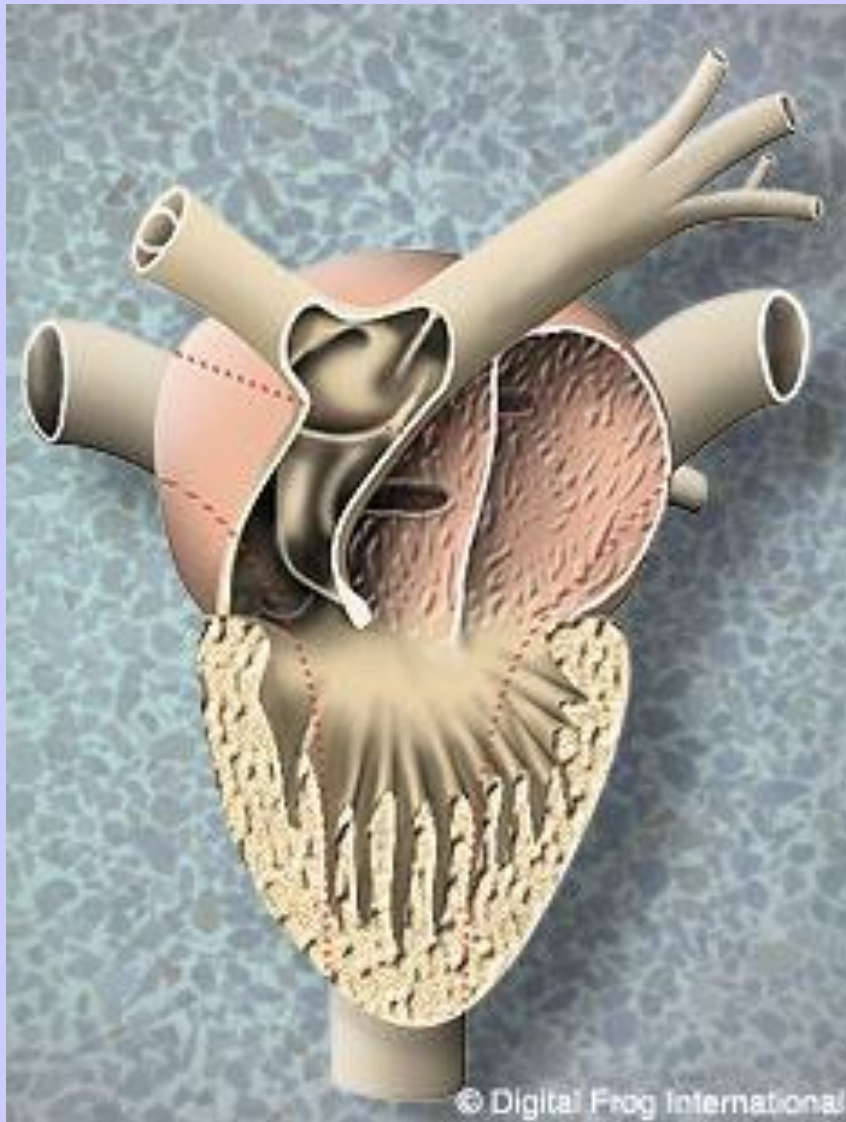
**1 loop → 2 loops**

**Breathe w/ gills → lungs & skin**

**Excrete ammonia → excrete urea**

**(gills & kidneys)**

**(kidneys)**



# HEART

3 chambered heart

Right atrium

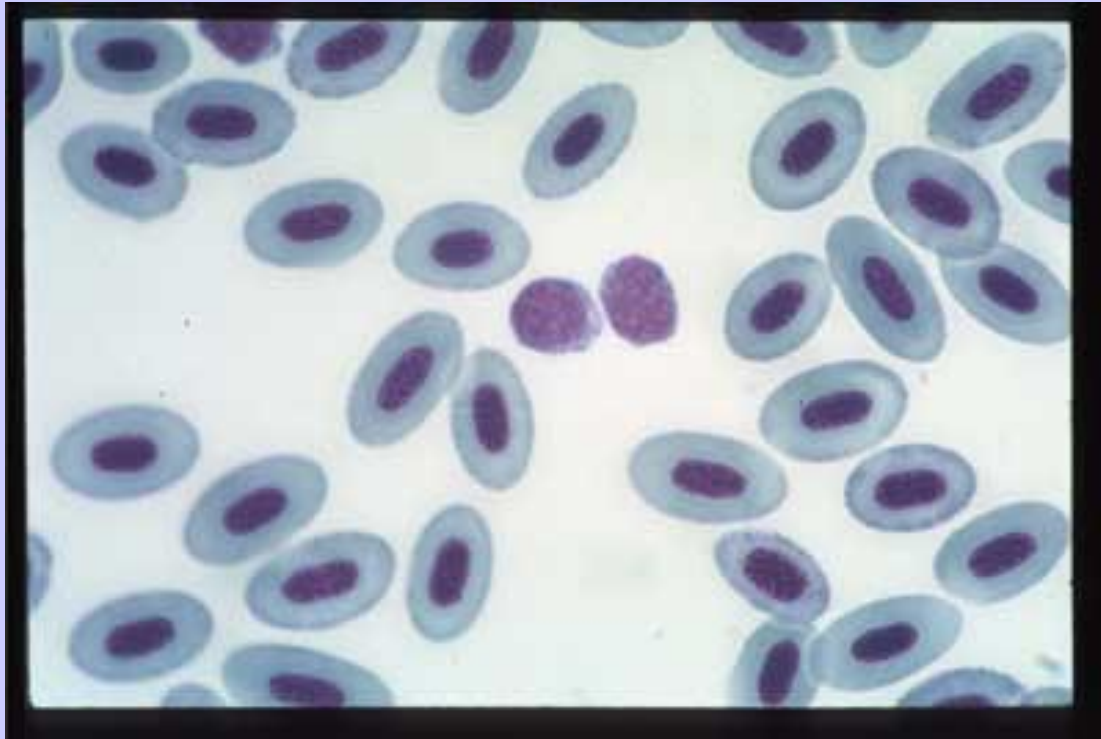
Left atrium

Ventricle

Image from: <http://www.digitalfrog.com/resources/froggallery.html>



# **MOST vertebrates have nuclei in their RBC's**

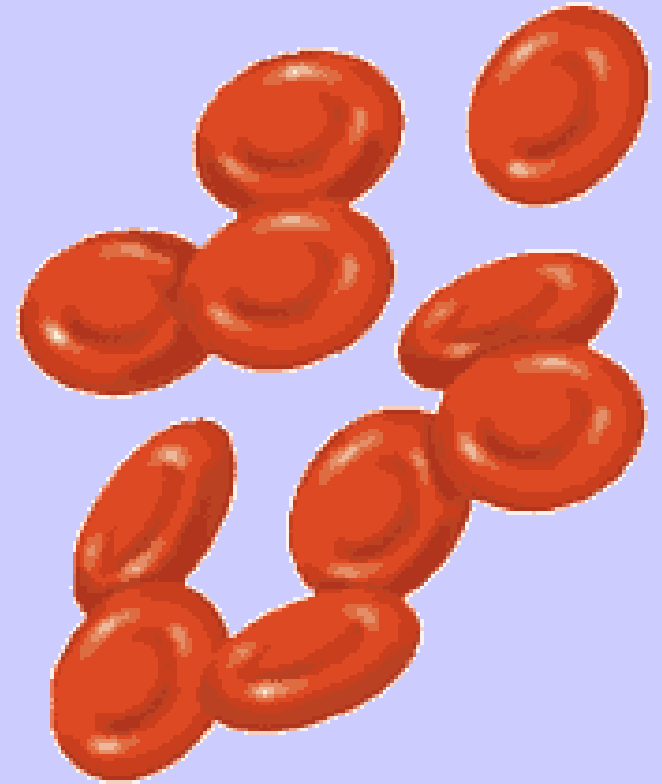


RBCs' image from:

<http://www.fish-news.com/RG4001.jpg>

Human RBC image from:

<http://www.nigms.nih.gov/moleculestomedes/images/bloodcells.gif>



## **MAMMALS DON'T**

# BRAIN

