


# Discuss:

- ▶ How have you changed over the past year?
  - ▶ What has caused those changes?
  - ▶ How do you think you will change in the next few years?
- 
- A decorative graphic consisting of several parallel white lines of varying lengths, slanted upwards from left to right, located in the bottom right corner of the slide.

# ENDOCRINE SYSTEM

is the collection of glands that produce hormones that regulate metabolism, growth and development, tissue function, sexual function, reproduction, sleep, and mood, among other things.

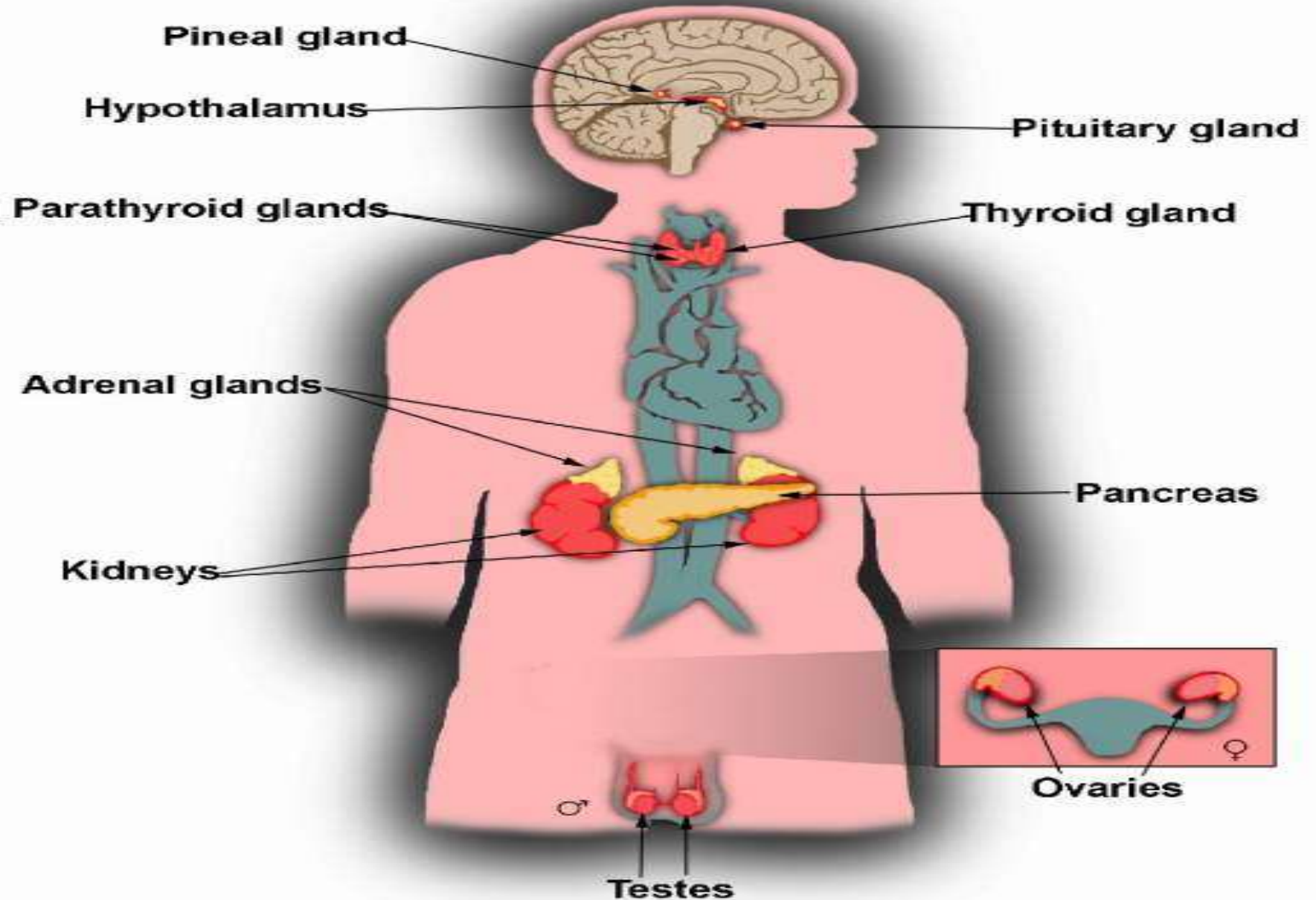
## ENDOCRINE GLANDS

are glands of the endocrine system that secrete their products, hormones, directly into the blood rather than through a duct. like the pituitary gland, pancreas, ovaries, testes, thyroid gland, parathyroid gland, hypothalamus and adrenal glands.

# Endocrine Glands

- The **Endocrine Glands** are the organs of the Endocrine System.
- They produce and secrete (release) **Hormones**.
- They are located all over your body.

## The Endocrine System



# Many changes in your body are due to the Endocrine System.

- **The Endocrine System regulates, coordinates and controls:**
  - Growth and development.
  - Male and female development.
  - How your body uses energy.
  - Levels of salts and sugars in your blood.
  - The amount (volume) of fluid in your body.
  - Appetite.
  - Many other body functions.



# Some Endocrine Glands and What they Regulate

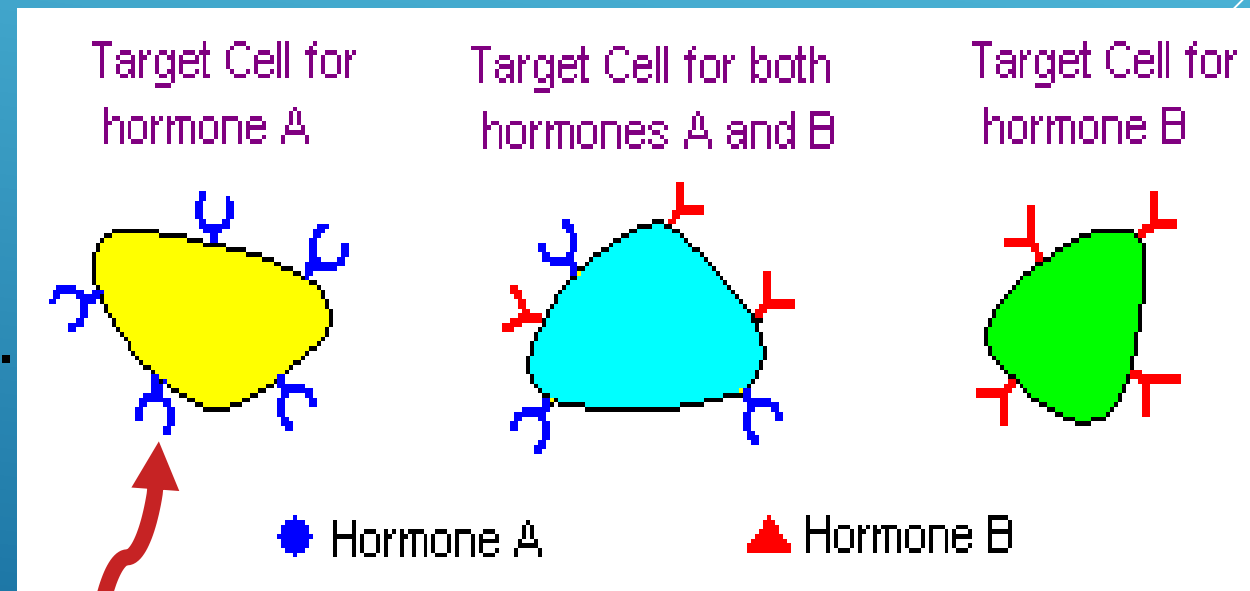
Gland	What it Regulates( in general)
Pituitary	“Master Gland” that regulates all other Endocrine Glands, also releases growth hormone
Thyroid	Metabolism, body heat, bone growth
Parathyroids	Use of Calcium and Phosphorous
Hypothalamus	Links nervous system to endocrine system
Adrenal	Response in emergency or stressful situations, metabolism, blood pressure, salt balance
Pancreas	Blood sugar
Ovaries	Production of eggs; female characteristics
Testes	Production of sperm; male characteristics
Thymus	Parts of the immune system

# Q. HOW DO YOU THINK THE ENDOCRINE GLANDS GET THEIR JOBS DONE ???

A. **Hormone** :is any member of a class of signaling molecules produced by glands in multicellular organisms that are transported by the circulatory system to target distant organs to regulate physiology and behavior.

## ■ Target Cells

- Hormones only work on certain cells, called target cells.
- The target cells have special receptors that “recognize” the hormones and allow them to influence that cell.



These receptors recognize the hormones. They “fit” like a lock and key.

# What Controls the Hormones?

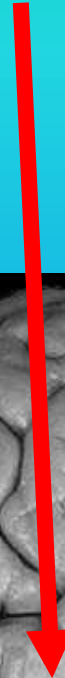
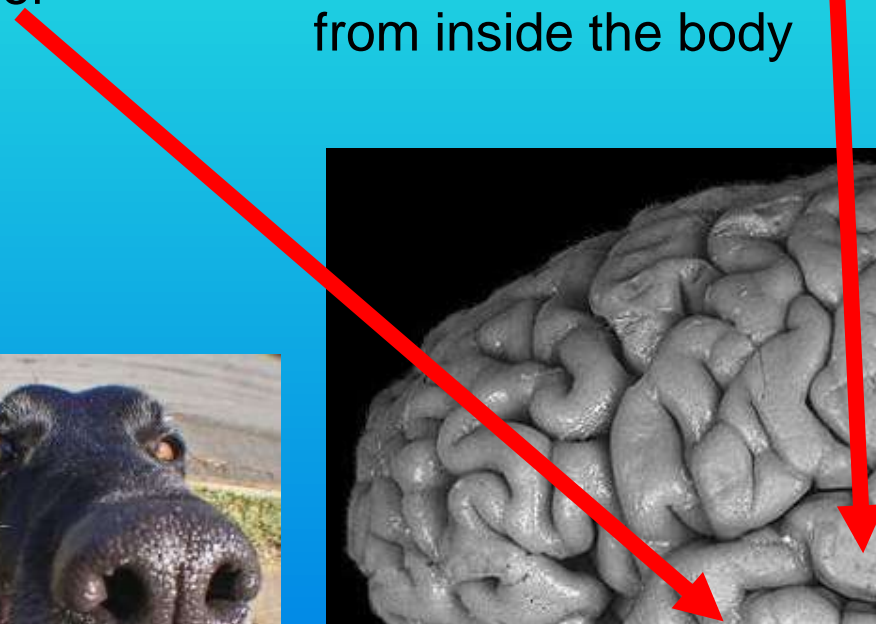
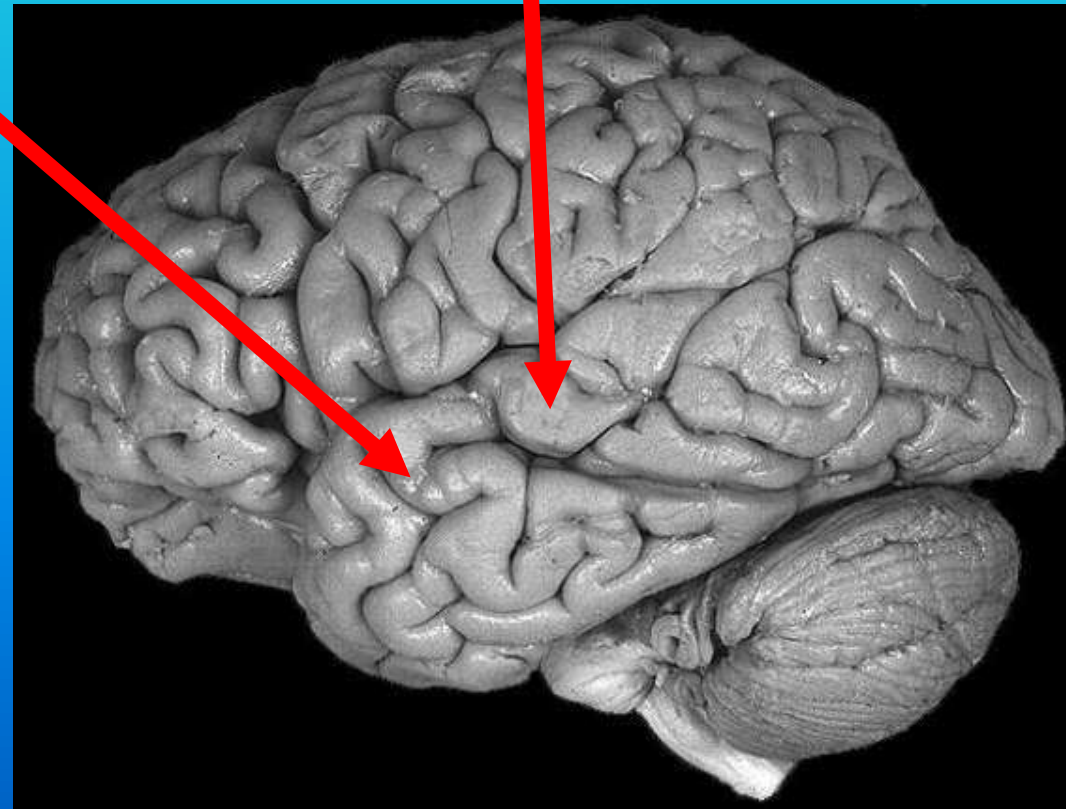
## External stimuli

by way of nerves from the sensory organs in the nervous system ( outside of the body)



## Internal stimuli

by way of nerves and other hormones from inside the body



	Endocrine system	Nervous system
<b>Signal type</b>	Hormone	<ol style="list-style-type: none"> <li>1. Action potential</li> <li>2. Neurotransmitter( electrical )</li> </ol>
<b>Speed of transmission</b>	Slow ( about a minute)	Fast ( 120 m/s)
<b>Target</b>	General ( Got a receptor)	Specific
<b>Effect of Action</b>	Slow	Fast



# Most hormone systems are negative feedback systems



- Negative feedback means that when enough hormone is in the body, the body stops producing the hormone until it is needed again.

You eat. Glucose (sugar) in the blood increases.



Increased glucose is detected by receptors that notify the brain. It sends a message to the pancreas to **produce insulin**.



Pancreas **stops making insulin**.

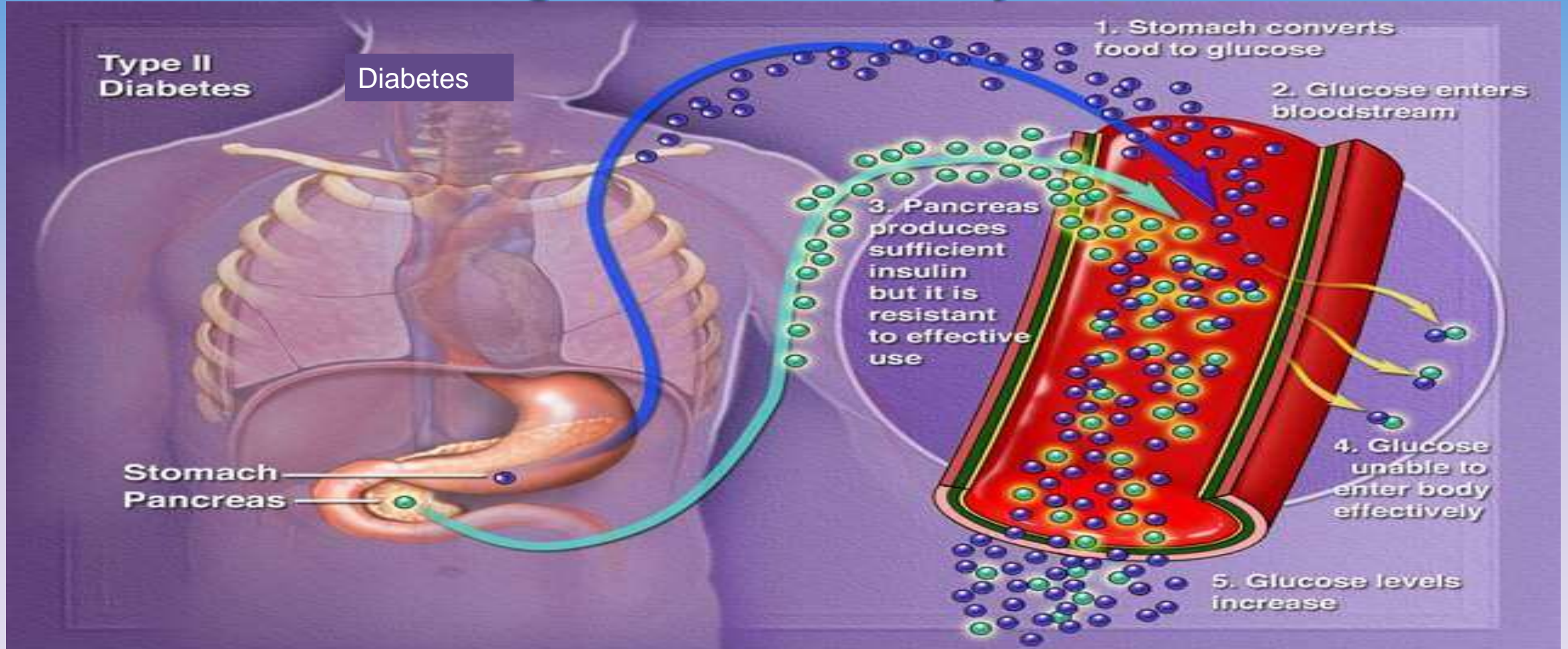


Blood glucose level drops as it is removed by the cells.



Insulin tells muscle and liver to take up glucose from the bloodstream and use it for energy or store it for later. Brain reduces appetite.

# In Diabetes, there is a problem with this negative feedback system.



In the case shown in this picture, the body produces insulin but the target cells become **resistant** and unresponsive to it. Diabetes can also be caused by the body not producing **enough** insulin. The glucose does not enter the muscle and liver cells like it should and it builds up in the blood causing complications.

## A few hormone systems are positive feedback systems:

The pituitary gland sends a signal by way of the hormone oxytocin to the uterus causing contractions. The pressure of the fetus on the cervix sends a signal back to the brain which then stimulates the release of more oxytocin. This causes more contractions. The fetus pushes harder on the cervix. More oxytocin is released. The system continues until birth occurs.

