

# **“Stem Cell Research”**

Keeping Informed of the  
Issues of Our Times

Chris Amenson - Elder

# Why is Stem Cell Research an Issue?

- There is a substantial group of Americans who believe that ***cures for diseases may be found in stem cells***
- These Americans are ***vocal*** and ***substantial***, and ***not going away***
- ***President Reagan's wife and son are vocal supporters of stem cell research*** for disease curing capabilities

# Nancy Reagan Speaks Out

Speaking to the Juvenile Diabetes Research Foundation 5/8/04



**Former first lady says  
research could help cure  
Alzheimer's**

**“Science has presented us with a hope called stem cell research, which may provide our scientists with many answers that for so long have been beyond our grasp. *I just don't see how we can turn our backs on this*”.**

# Popular Response

- Letters from former presidents **Gerald Ford, Jimmy Carter** and **Bill Clinton** supporting Reagan's efforts on embryonic stem cell research were read to the dinner by actors Harrison Ford and Calista Flockhart.
- Absent was any comment from the **Bush administration**, which has placed **severe restrictions on stem cell research** because it can involve using cells from human embryos.

# Ron Reagan to Address Democratic Convention



**Late president's son to address stem cell research, likely calling for a removal of the restrictions placed on stem cell research by President Bush**

# What is Our Christian Response?

- **Option One** – leave the issue to others to address on our behalf.
- **Option Two** – “*Always be prepared to give an **answer** to everyone who asks you to give the **reason** for the hope that you have. But do this with **gentleness and respect.**” 1 Peter 3:15*

# What is Our Christian Response?

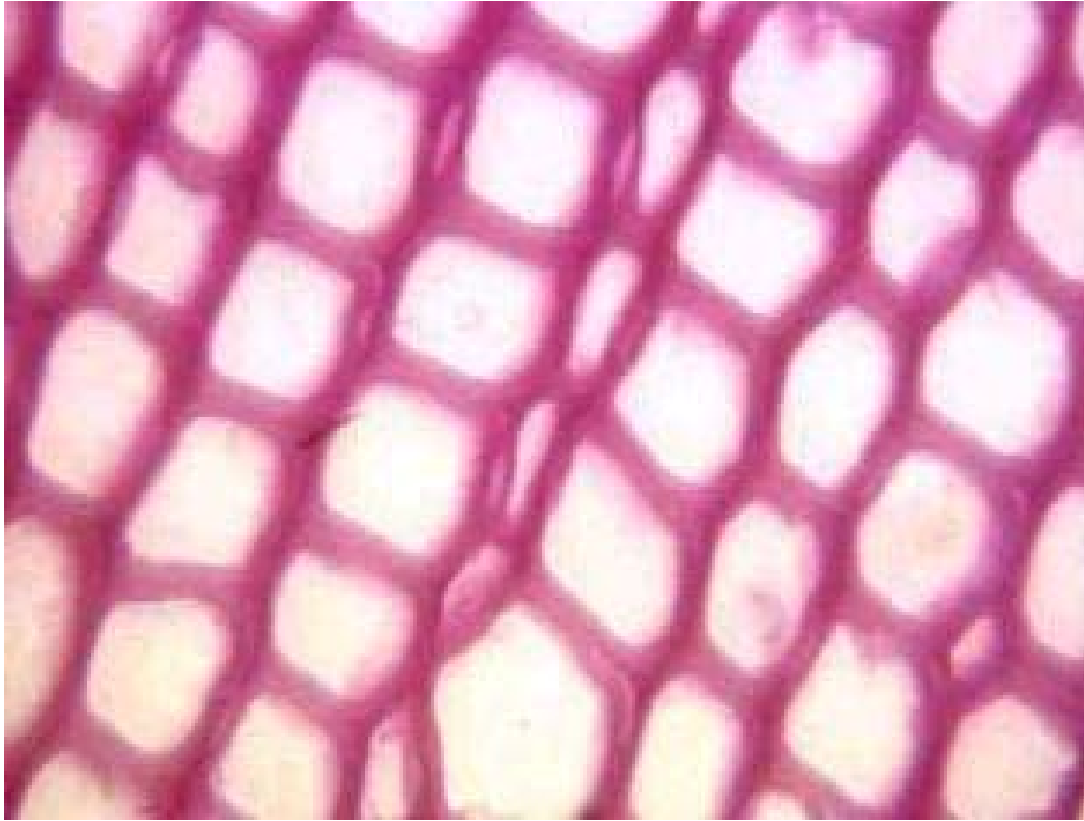
- Being prepared means **understanding** the issue.
  - Understanding the **underlying science**
  - Understanding what **Scripture says about the subject**
  - Being prepared to **give an answer for the hope that we have**

# Cell – what is it?

An ***autonomous self-replicating unit*** (in principle) that ***may constitute an organism*** (in the case of unicellular organisms) or be a ***subunit of multi-cellular organisms*** in which individual cells may be more or less specialized (differentiated) for particular functions.

***All living organisms are composed of one or more cells.***

**Cell – smallest living unit  
capable of self-replication**



# Two Types of Cells Exist

**Prokaryotes** are single-celled life forms that lack a nuclear membrane (a sac-like structure in a cell that contains the cell's genetic material). Instead, the genetic material (DNA) of prokaryotes floats free in the cell. Generally the term prokaryotes is synonymous with **bacterial cells**

# Two Types of Cells Exist

**Eukaryotes** are organisms having cells that possess a nuclear membrane encasing the cellular genetic material (DNA), so that the cells have a central genetic region called a nucleus. Eukaryotes are much larger than prokaryotes, generally about 100 times larger.

# Two Types of Cells Exist

**Eukaryotes** include **human and all other animal and plant cells**, fungi (molds, slime molds, yeasts), and **unicellular animals called protozoa** (microscopic animals that swim in ponds, plankton that whales feed on), and blood parasites

# What are humans?

- **Metazoans** are the *multi-cellular eukaryotes*, in contrast to the protozoa (single-celled animal eukaryotes) and yeasts (single-celled fungi eukaryotes).
- **Humans** and most animal life forms that you are able to see with your naked eye are **metazoans**

# Just who are we again?

**Prokaryotes**

(single cell life forms)

**Eukaryotes**

(has nucleus and DNA)

**Metazoans**

Multi-cell life form

**Humans**

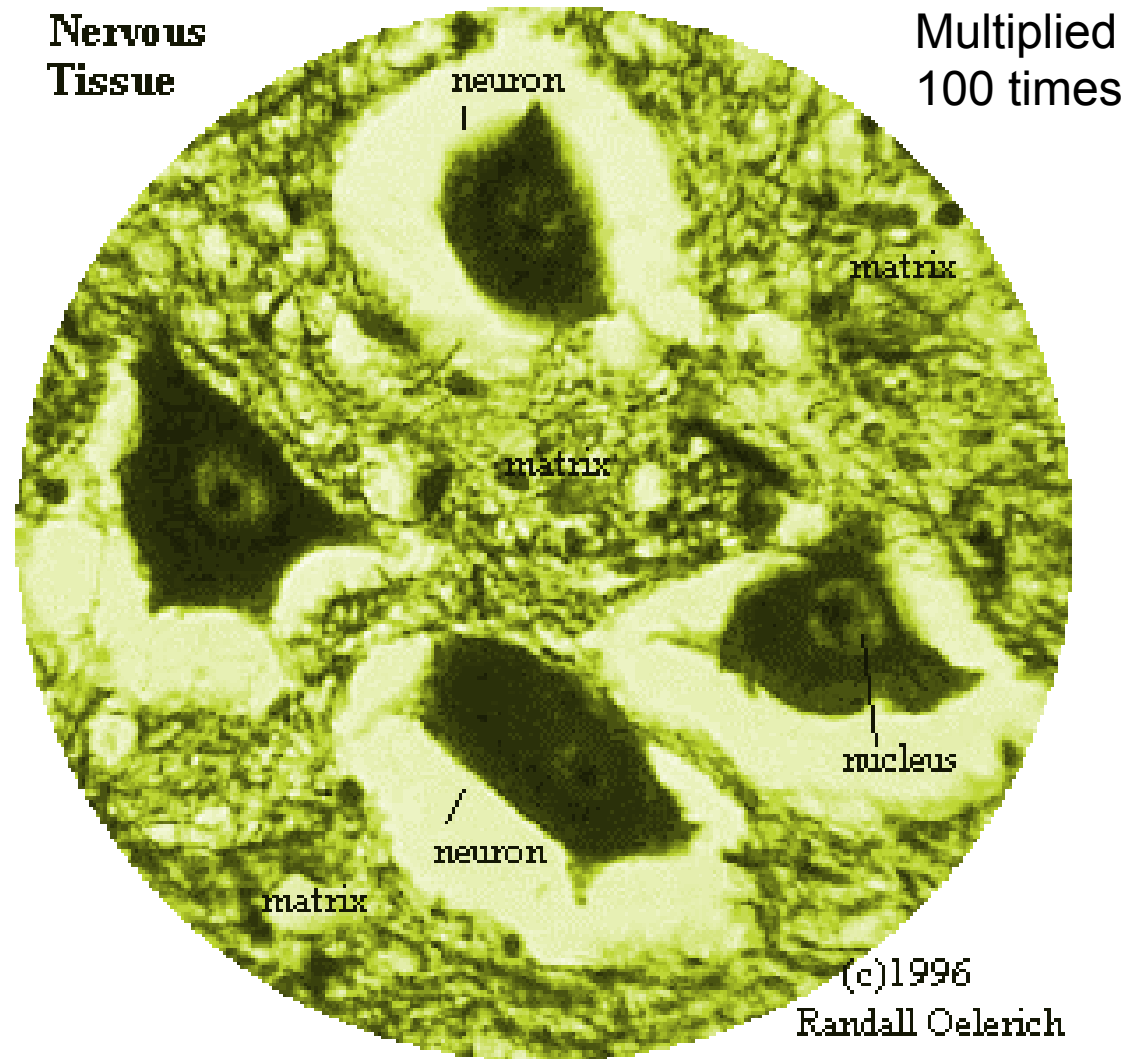
**Protozoa**

Single cell life form

# How Big are Cells?

- Cells are **microscopic in size**, requiring microscopes for visualization
- About **10 human cells** could be stacked on top of one another in the **thickness of a piece of paper**.
- Human red blood cells are about 7.5 micrometers wide, and are about 5-100 times as large as bacterial cells.

# Here are 4 human cells!



# Cell line

- A **cell line** is a permanently established **cell culture** that will **proliferate indefinitely** given appropriate fresh medium and space.
- **Lines** differ from **cell strains** in that they have escaped the Hayflick limit (cells dying after about 60 reproductions) and become immortalized
- New cells lines are easy to create in rats and very difficult to create in humans

# Finally, we get to Stem Cells!

- **A definition:** Stem Cells are *non specialized cells* that have the capacity to self-renew and differentiate into more mature cells
- Stems cells form the **basis of organs** in the body
- Stems cells are found in **newly created** beings as well as **existing people**

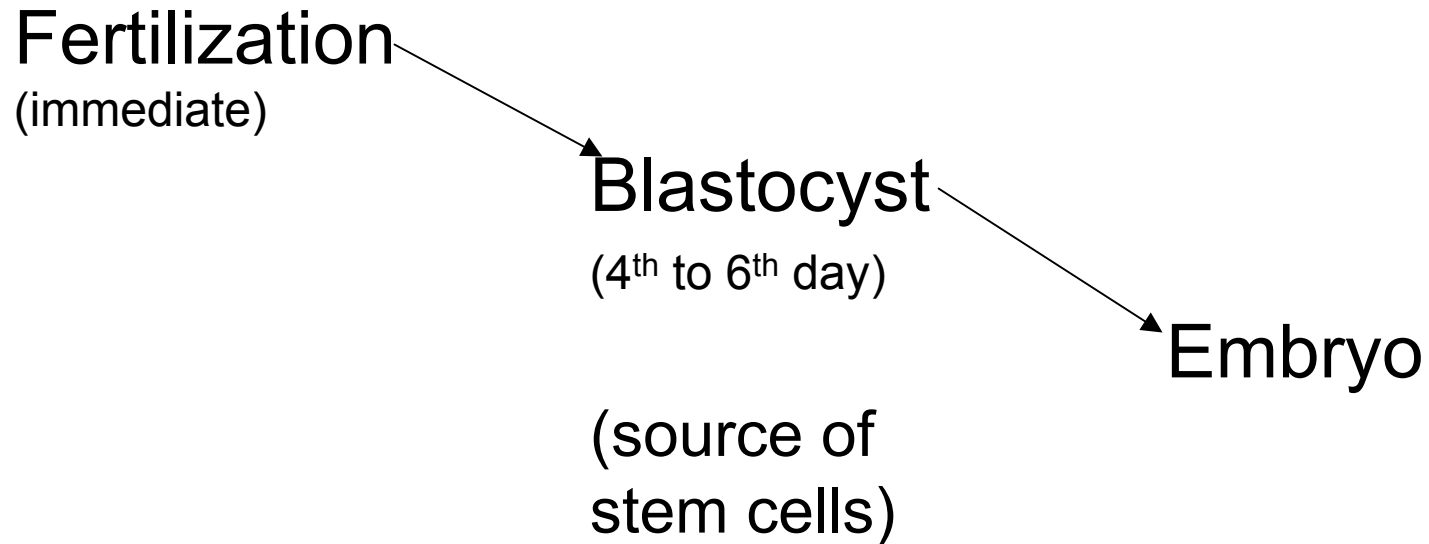
# Types of stem-cells

- **Adult stem cell** - A cell taken from mature tissue that can renew itself but has a limited ability to transform into specialized cell types
- **Embryonic stem cell** – tissue taken from a “blastocyst” before it officially becomes an embryo

# **Wanted: Blastocyst!**

**A pre-implantation embryo** consisting of 30 to 150 cells---usually **most ripe for stem cells** between the **4th and 6th** day **after** the sperm has **implanted** the egg.

# How this works!



# Embryonic Stem Cell

- A **cell** from an **embryo** (really from a “blastocyst”) that has the potential to become a wide variety of specialized cell types
- Believed **not to have the effect** of the **DNA just yet**, therefore it won't resist becoming part of another organ

# Pluripotent Stem Cells

- **Stem cells**, located in the inner area of the blastocyst, **have not yet had their ultimate form determined**, such that they appear able to **become any of the 220 different cell types** which comprise the human body.
- The stem cells are therefore, “**pluripotent**”.
- Once **programmed by DNA** the stem cells take on the cell types of the **organism described by the DNA**.

Now tell me, once again?

Just why are we learning  
about pluripotent stems  
cells in church?

# Why has this become an issue now?

In November 1998 researchers at the University of Wisconsin, working under funding from Geron Corp., announced that they had **cultured stem cells** taken from a **human embryo, stopped the development of the cells in their normal “differentiation” into organ cells**, and had kept them multiplying while maintaining the “pluripotency”.

# Why has this become an issue now?

This scientific advance appears to indicate that science may be able to **direct the stem cell development into cells necessary to repair tissue in directed areas, such as nerves, brain, lungs, pancreas, arteries and heart, by programming the DNA of the stem cells on an intended basis.**

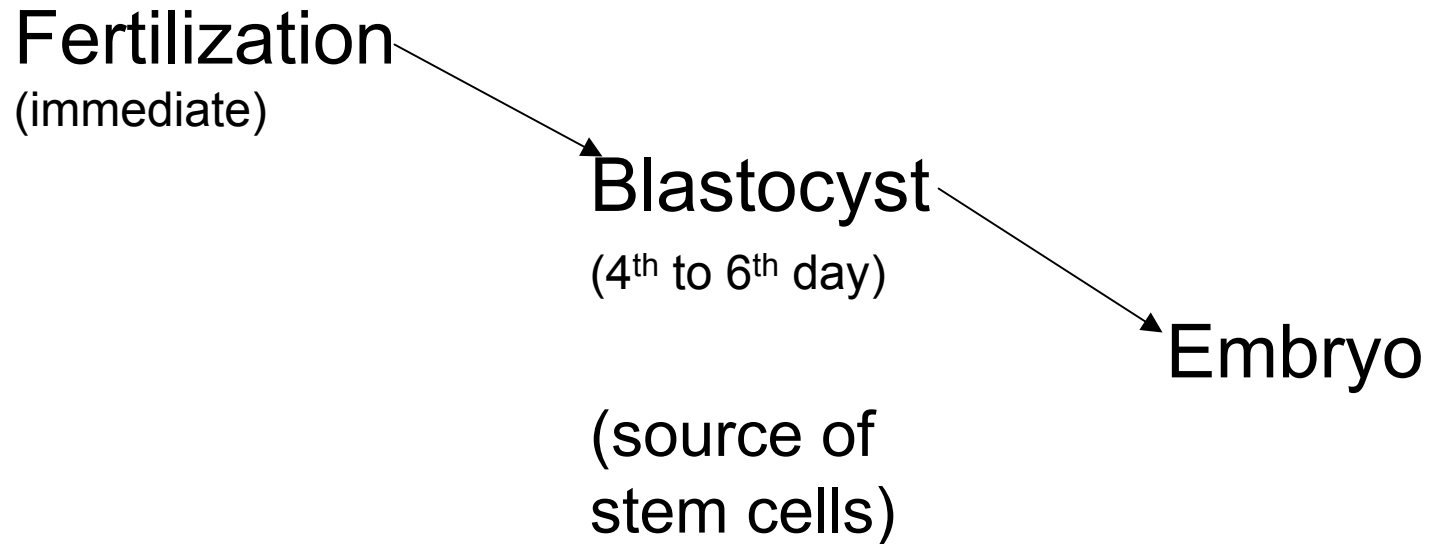
# Why stem cells are important?

The hope is that **science** will be able to **reverse or reduce the effects of disease---** and eventually **aging---** to improve the lives of millions of people affected by debilitating diseases such as **diabetes, heart illness, Parkinsons, Huntingtons, ALS, Alzheimers** and damage due to accidental injury.

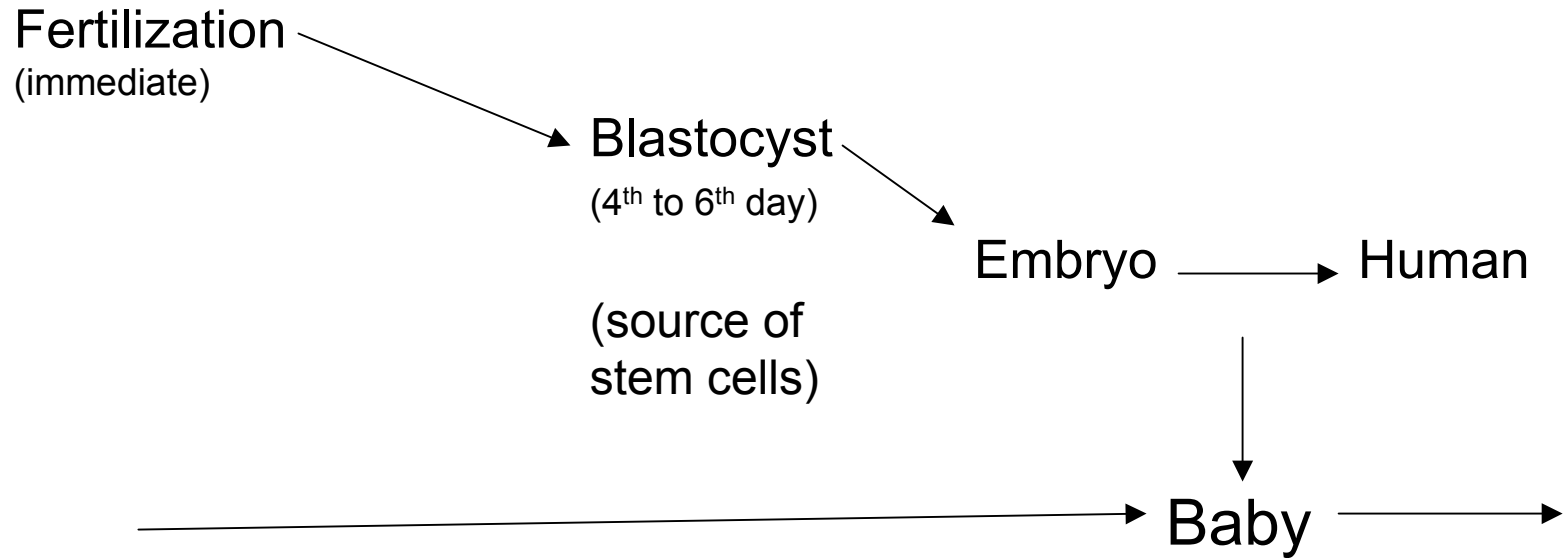
# Why is science creating a problem?

- Under today's methods, **removing the stem cells from the blastocyst, or embryo, causes the embryo to die.**
- When we **cause an embryo to die, are we not committing murder?**
- The question becomes: **“What is an embryo if not human, or at least the precursor to humanity”?**

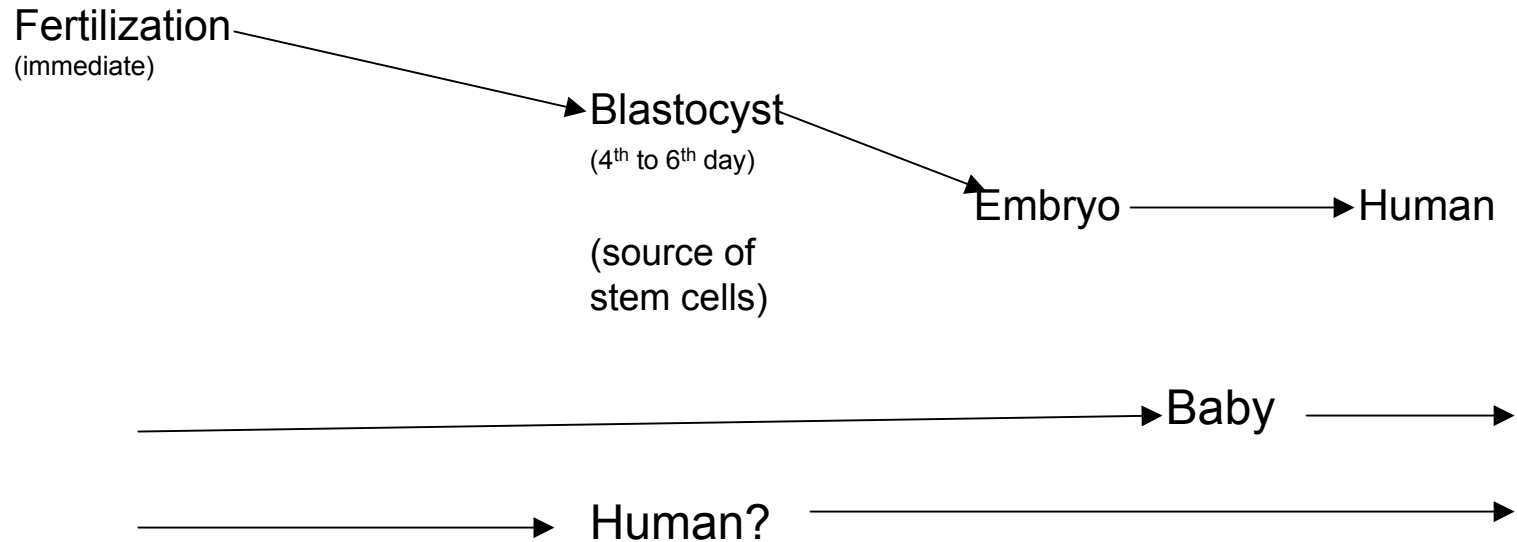
# How this works!



# How this works!



# Why is science creating a problem?



# Why is science creating a problem?

Some (Christians, the Roman Catholic Bishops and Pope, and most Right-to-Life groups) view the **Embryo as the earliest phase of human life, deserving to be respected, honored and imbued with the same rights as fully developed persons.**

# Two forms of stem cells

“Adult” stem cells



Taken from adults



The adult lives

“Embryonic” stem cells



Taken from embryos



The “embryo” dies

# Why does what scientists do with stem cells pose a problem to Christians?

- Because Christians have to see the stem cells (e.g. blastocyst, embryo, pre-natal infant) as the earliest form of humanity
- Because Christians protect the unborn, they do not harvest them for benefit of any other living creature
- When Christians fail to protect all forms of living humans then they begin to “de-humanize” humanity, whom Jesus died for

# What are Humans?

Gen: 1:26 -27 Then God said, "Let us make ***man in our image***, in our likeness, and let them rule over the fish of the sea and the birds of the air, over the livestock, over all the earth, and over all the creatures that move along the ground." **So God created man in his own image, in the image of God he created him; male and female he created them.**

# God Gives Man Time to Develop

He offers His grace, strength, and protection to help us develop (Romans 8:29) “For those God foreknew he also predestined to be conformed to the likeness of his Son, that he might be the firstborn among many brothers. “

# God Gives Man Time to Develop

**All humans, whether they accept God's help or not, remain images of God.** As such, He continues to pour His nourishment on them (Matthew 5:45). All humans are entitled to the same respect because all are images of God (Genesis 9:6, James 3:9)

# We always are human!

In repenting of his adult sinfulness, David notes that this is part of who he has been all along: "***Surely I was sinful at birth, sinful from the time my mother conceived me***" (Psalm 51:5). Descriptions of Samson, Job, Isaiah and Jeremiah reveal the same pattern (Judges 13:3-5; Job 3:3; 10:8-11; Isaiah 49:1; Jeremiah 1:5)

# Scripture's Consistent Language

In Greek, the same word (***brephos***) is used of the **unborn** John the Baptist (Luke 1:41, 44), the **infant** Jesus (Luke 2:12, 16) and **older children** (Luke 18:15-16)

# David's View

Throughout Psalm 139, David reflects on how God's intimate knowledge of him started in the womb, as did God's protection. David is therefore encouraged that God will continue to protect him even though his enemies are close by.

# What does Scripture Say?

- **Exodus 20:13 "You shall not murder."**
- Is not the taking of human life, in its earliest form, murder?
- If not, what's the big deal about abortion?
- Or Genocide?
- Or Fratricide?
- Or Homicide?

# Getting Back to Stem Cell Basics

- **Adult stem cell research is OK because the cells are taken from an individual who still lives**
- **Embryonic stem cell research involves killing an unborn individual, and is therefore not OK – it is wrong.**

# Research Results So Far

- Adult stem cell research is promising, giving rise to healing operations and therapies
- Embryonic stem cell research is not yielding any significant progress, and therefore some want federal dollars to step in and fund research

# What we Need to Do

- Be clear (Scriptural) about our thinking
- Pray that God will use you in His battle for the unborn
- Be open to the leading the Holy Spirit
- Act when He calls us to act!
- Go where He calls us to go.
- Do what he asks us to do!

# What this may mean to you...

- Listening for the call of God, to go where He ask you and do what he wants
- Staying familiar with the science of stem cell research as it unfolds, at a high level
- Speaking out to friends and family about stem cell research
- Voting with your Christian conscience when it comes time to vote for those who will decide these issues

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