

Creation Cloning and Life

The Value of Life

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Answers In Genesis

www.AnswesInGenesis.org

Topics

- ◆ Cloning - the Results
- ◆ Stem cells: what are they?
- ◆ More on cloning
- ◆ The value of life – when does it begin?



Genesis 1:1

In the beginning God created the
heaven and the earth.

Genesis 2:7

And the LORD God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul.

Colossians 1:16-17

For by him were all things created, that are in heaven, and that are in earth, visible and invisible, whether *they be* thrones, or dominions, or principalities, or powers: all things were created by him, and for him: And he is before all things, and by him all things consist.

What the Bible Teaches

- ◆ God was before time (In the beginning God created)
- ◆ God is the Creator of all life (after its kind)
- ◆ God is the Creator of all things

Where does cloning fit into all this?



What Is Cloning?

- ◆ A clone is a genetically identical copy of a living organism, such as the famous sheep 'Dolly'
- ◆ Similar to an identical twin



Hello Dolly

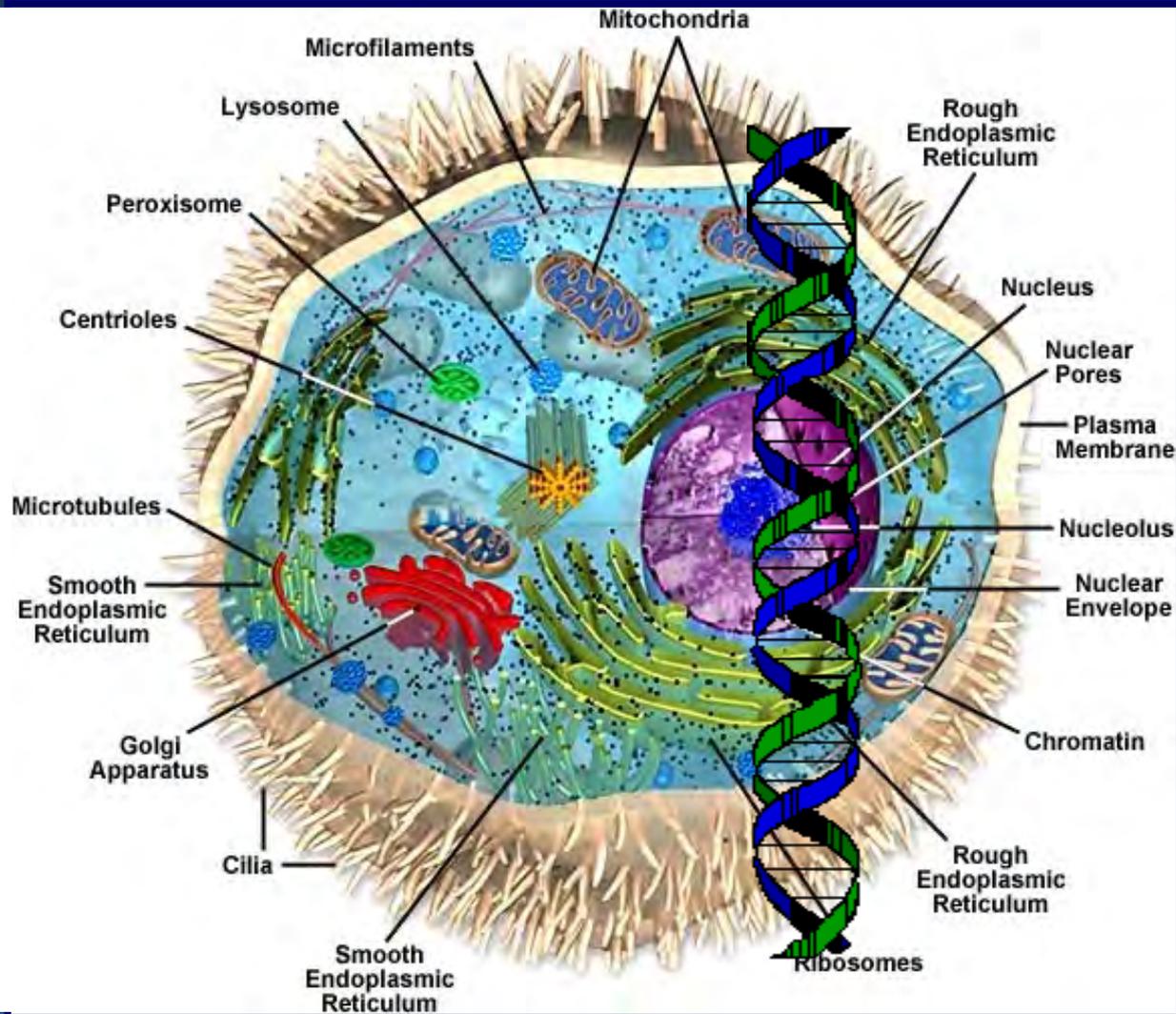


July 5, 1996, Dolly was born at the Roslin Institute, Edinburgh, Scotland

She was cloned using a cell taken from a healthy six-year-old sheep

Cloning and the Cell

Nucleus

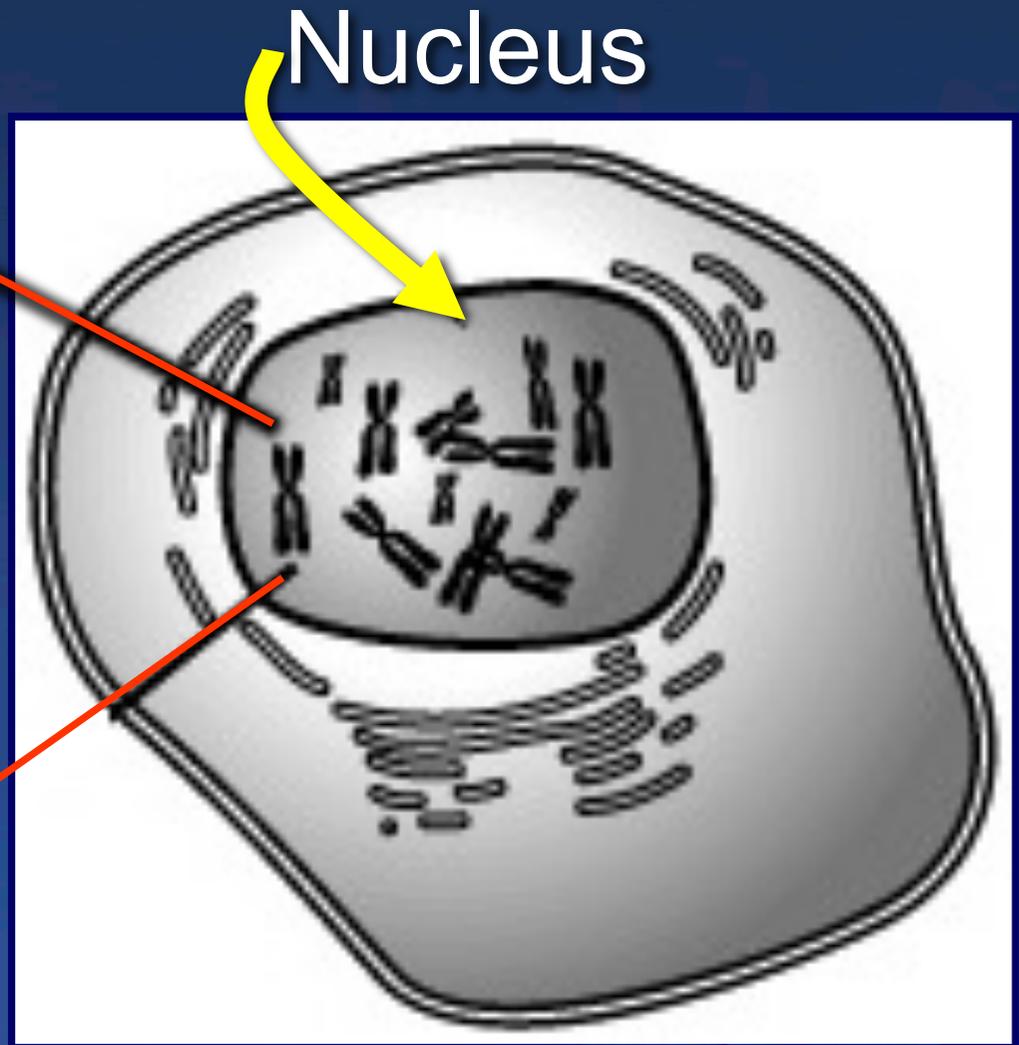


Its all about DNA

Cloning Depends on DNA



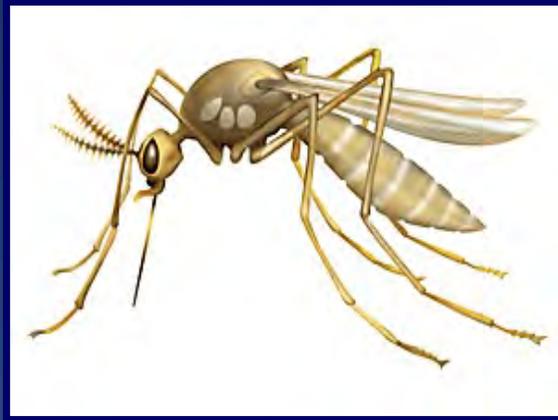
Chromosome



Chromosomes



16



6



24



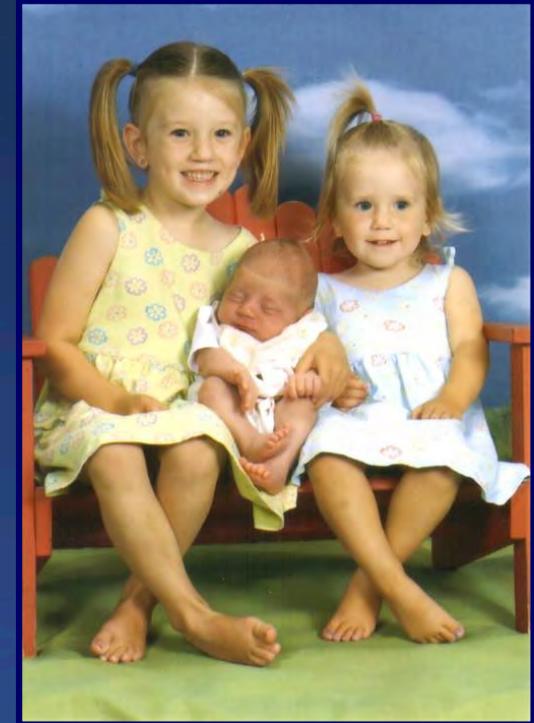
Chromosomes



78



40



46

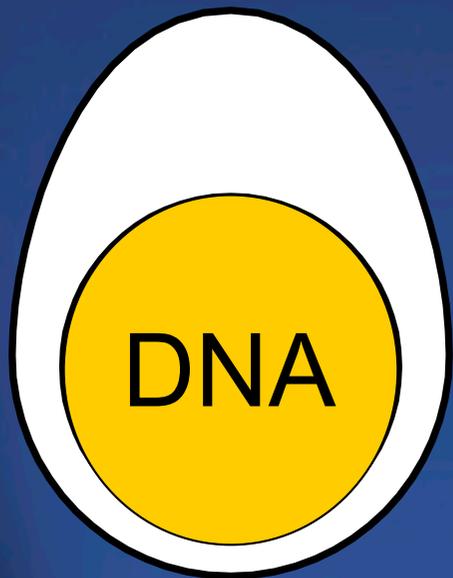


The Making of Dolly

Cloning depends on DNA

Step 1: Take the Nuclei out of a sheep egg

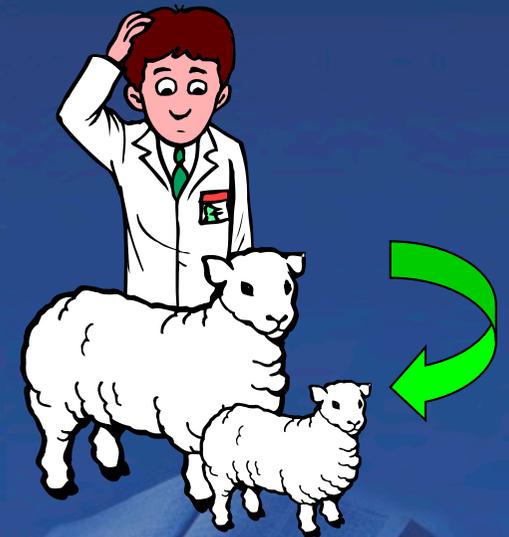
Step 2: Transfer nuclei from the Mother



Sheep Egg

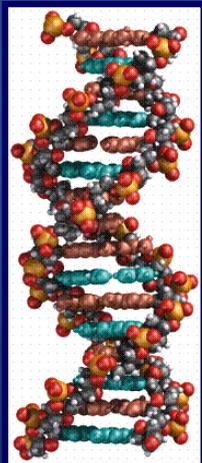


Mother's Egg



Good-Bye Dolly

- ◆ At age 3 Dolly showed signs of premature aging.
- ◆ Dolly died at 6 years old from progressive lung disease (symptom of old age)
- ◆ Dolly's DNA was already 6 years old when she was born - WHY?



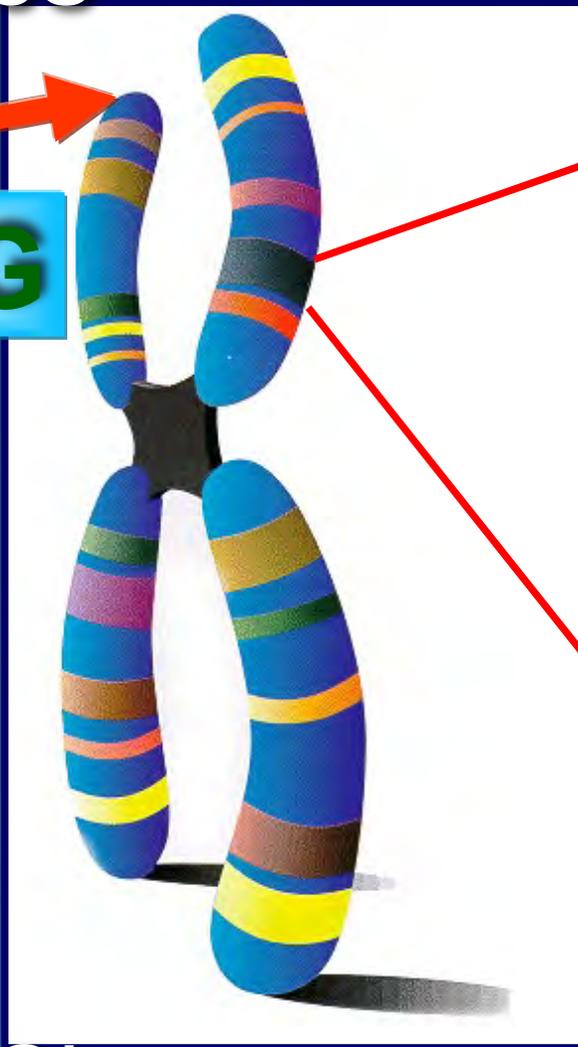
It's all about DNA



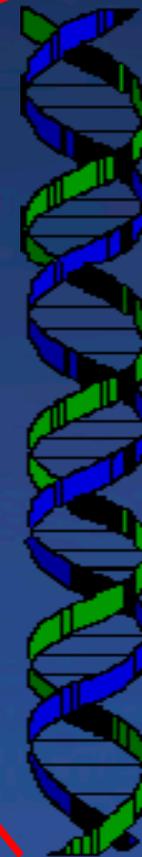
Telomeres

Telomeres

TTAGGG



Chromosome



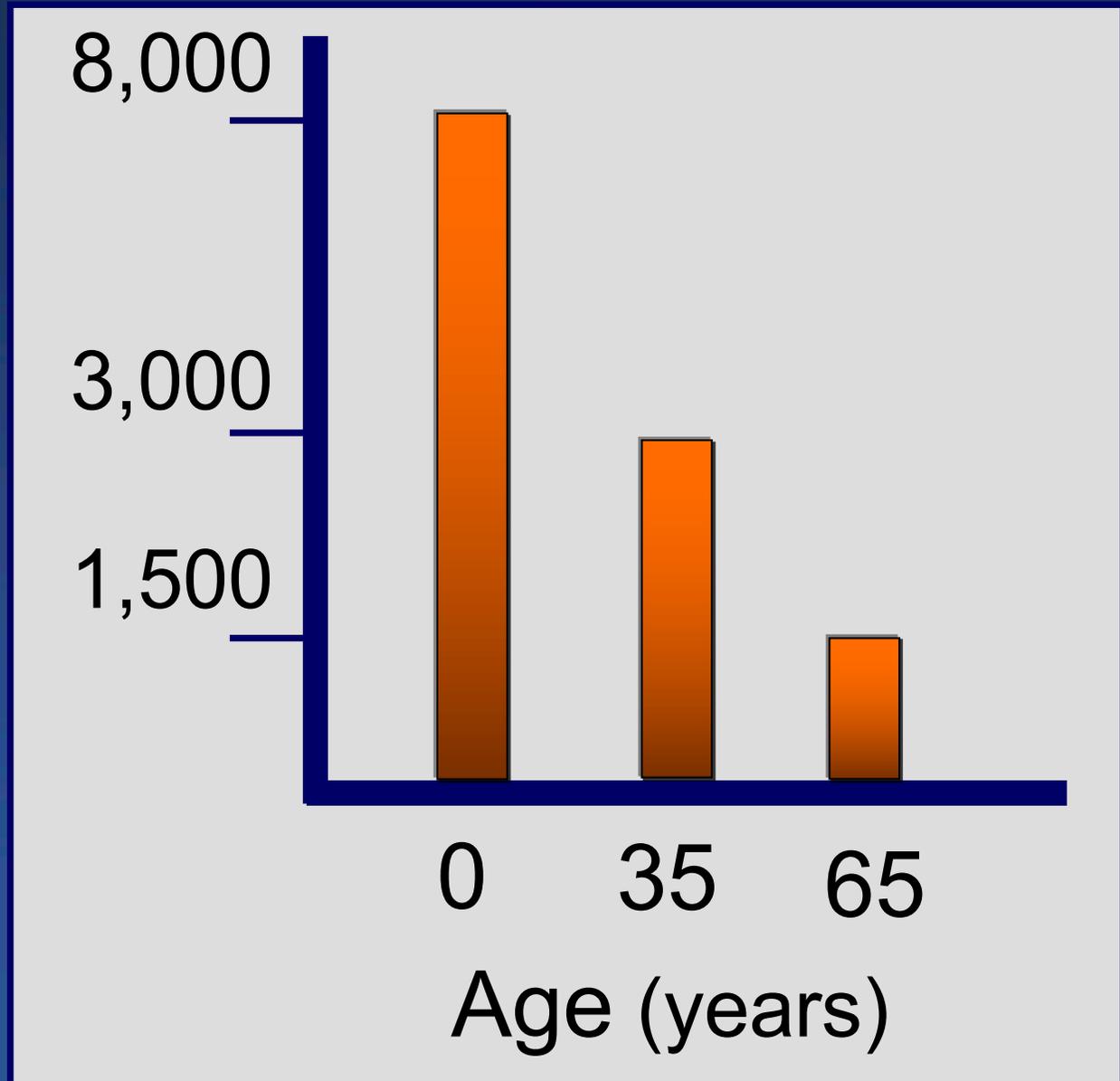
Gene 1

Gene 2

DNA

Telomere Length Declines

Telomere length
in base pairs
(human white
blood cells)



More on Dolly and Cloning

Dolly's experimenters used 277 cloned embryos to produce one sheep, meaning 276 failed.

Question

How many failures will it take to produce a human



Other Cloned Animals



July 1998
cloned calves



Cloned
mouse



Cloned
mule



Other Cloned Animals



December 2001

Five cloned female piglets, named Noel, Angel, Star, Joy and Mary



December 2001

The world's first cloned kitten, named Cece

Future Experiments



ButterCat



CatCow



Future Experiments



Catrilla



Future Experiments



SparrowBoxer



TigerOwl



Two Types of Cloning

Reproductive Cloning

Therapeutic Cloning

Question

Is either type of cloning good?



Reproductive vs Therapeutic Cloning

- ◆ The goal of Reproductive cloning is to produce a baby
- ◆ The goal of therapeutic cloning is to produce stem cells for research or treatment

What are stem cells?



Stem Cells

By definition stem cells are capable of self-renewal and becoming many cell types to form tissue in humans

Two Types

- ◆ Embryonic stem cell (ESC)
- ◆ Adult stem cells



Stem Cells

- ◆ Each individual begins as a single cell
- ◆ As the embryo grows, different cells in different places begin to specialize (the cells become *differentiated*)



Embryonic Stem Cells (ESC)

- ◆ Capable of differentiating into any of 200 cell types in the human body
- ◆ The stem cells, or early embryo, are disrupted from natural development through chemical manipulation to become specific tissue types
- ◆ Expectation is they will be used to treat unhealthy or diseased tissue to those already born

President Bush: No federal funds would be used to support the destruction of embryos

Adult Stem Cells

- ◆ An alternative source (does not involve the destruction of human embryos)
 - ◆ Can come from a donor or individual needing treatment
 - ◆ Limited differentiation?
 - ◆ Many clinical advantages over ESCs
 - No tissue rejection
 - Come from many places in the body (Placenta, cord blood, bone marrow, kidneys, hair follicles)
- 

Adult Stem Cells

Currently used to treat over 70 diseases

Leukemia, breast cancer, liver disease, cornea restoration, brain tumors, arthritis, and heart disease



Adult Stem Cells

Heart Disease

C.J. Chiu, professor of cardiothoracic surgery injected adult stem cells from bone marrow into the hearts of rats. These cells differentiated into new heart muscle that made the right connections to nearby cells so they could all beat together.



Adult Stem Cells

Skin Disease

Adult stem cells can be transformed into skin cells which can be used for skin grafts.



Adult Stem Cells

Diabetes

A team led by University of Florida permanently cured insulin-dependent diabetes in mice, with adult stem cells.



Adult Stem Cells

About Genetics, “Umbilical Cord Stem Cells: Hope for Millions?” Feb 2001, (the annual meeting of the American Association for the Advancement of Science)

“Given the abundance of umbilical cord stem cells and the fact that umbilical cord cells are already being used for other disorders like childhood leukemia, many researchers expect that umbilical cord stem cells will start being used to treat stroke victims within the next few years.”



Adult Stem Cells

David Prentice (Ph.D. Genetics), *National Review*, 2001

'Adult stem-cell research ... has already shown itself to be extremely promising for treating numerous degenerative diseases such as heart disease, stroke, Parkinson's, Alzheimer's, and diabetes.



What About ESCs?

Daniel Criswell (Ph.D. Molecular Biology), “Stem Cell research: Greasing the 'Slippery Slope' to Godlessness”, *Impact*, February 2005

“Presently, no one has succeeded using ESCs for human therapeutic or reproductive cloning...”



What About ESCs?

Dr Rudolf Jaenisch of the Whitehead Institute for Biomedical Research in Cambridge, Massachusetts, published in the journal *Science* that embryonic stem cells used in cloning mice often result in severe abnormalities



Embryonic Stem Cells

Four Problems / Concerns

1. Require lifelong use of drugs to prevent rejection of tissue
2. Can produce tumors from rapid growth when injected into adult patients
3. Can produce tragic side effects (*New England Journal of Medicine*)
4. Mice clones using ESC were genetically defective



The Media and Hollywood

Celebrity Parkinson's disease victims such as Michael J. Fox and Michael Kinsley regularly tout ESC research as the best hope for a cure of their disease.

Both have remained strangely silent about the fact that researchers treated Parkinson's with the patient's own adult stem cells.



Dolly's creator to clone embryos

Scottish scientist will use human stem cells to study muscle-wasting illnesses

Associated Press

LONDON — The scientist who attracted the world's attention by cloning Dolly the Sheep is about to take another major step for medical research: cloning human embryos and extracting stem cells to unravel the mysteries of muscle-wasting illnesses like Lou Gehrig's disease.

Ian Wilmut, who led the team that created Dolly at Scotland's Roslin Institute in 1996, was granted a cloning license Tuesday by British regulators to study how nerve cells go awry to cause motor neuron diseases.

The experi-



Ian Wilmut



Cloning human embryos and extracting stem cells...



Stem Cell Conclusion

- ◆ Many people have the misconception EBCs offer the greatest promise
- ◆ Adult Stem Cells are proven
- ◆ The media has distorted the truth
- ◆ Medical research could be adversely affected by this distortion



The Bible and Creation

Cloning

Stem cells

Cloning

When Does Life Begin?



Unreported Results of Cloning

- ◆ More than 90% of cloning attempts fail to produce viable offspring
- ◆ Cloned animals tend to have more compromised immune function and higher rates of infection, tumor growth, and other disorders
- ◆ Many cloned animals have not lived long enough to generate good data about how clones age



Cloning

Cloning expert Dr. Patrick Dixon states:

"The greatest worry many scientists have is that human clones - even if they don't have monstrous abnormalities in the womb - will need hip replacements in their teenage years and perhaps develop senile dementia by their twentieth birthday."



Human Cloning

Question

Why would anyone in their right mind want to clone a baby when animal cloning can go disastrously wrong?



Something New: Telomerase

- ◆ Telomerase is an enzyme capable of increasing telomere length
- ◆ Telomerase is active almost exclusively in cancer cells
- ◆ By turning on telomerase, function can be restored to the shortest telomeres



Something New: Telomerase

- ◆ Contains both an RNA and protein component (reverse transcript)

DNA → Transcription → **RNA**

DNA ← Reverse transcription ← **RNA**

- ◆ Prolongs the life of some cells by repairing the ends of DNA (increasing telomere length)



Something New: Telomerase

- ◆ Active in early fetal development when cells are rapidly dividing
- ◆ After birth operates at low levels in normal cells
- ◆ Operates rapidly in cancer cells, bone marrow, and skin

Will it be a **Maybe** or a **Yes**?

Telomerase

- ◆ Telomerase is only active in certain rapidly dividing stem cells in skin and bone marrow
- ◆ Telomerase inhibitors can't completely eliminate all cancers. A minority of cancers use an alternative pathway for telomere lengthening
- ◆ Telomere maintenance is more complex than simply the maintenance of length, overall structure of the telomere is also important

Telomerase

- ◆ If the wrong cells start manufacturing telomerase, they can become immortal - a necessary step in the development of cancer

More research is required





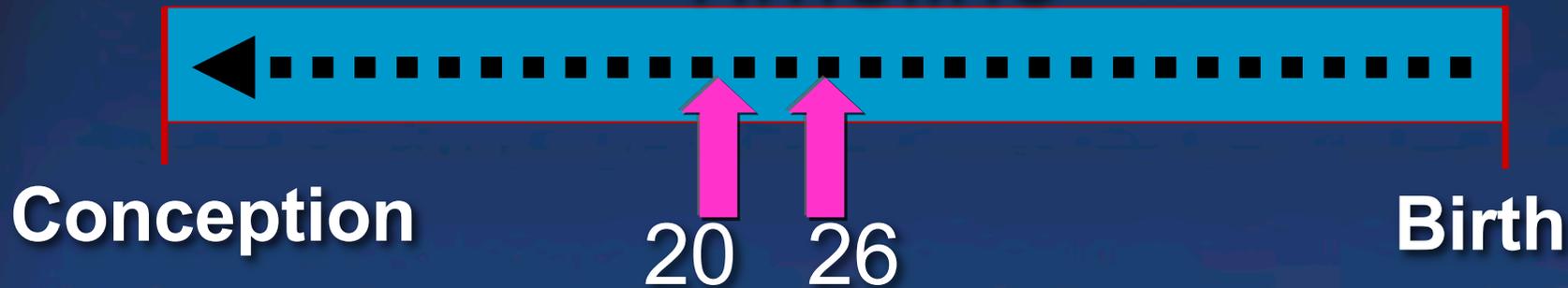
Cloning and Life

What has cloning taught us about when human life begins?



The Human Baby

Timeline



- ◆ **26 weeks:** Brain wave patterns resemble those of a full term baby at birth. Eyes are partially open and eyelashes present. Sucking and swallowing improves.
- ◆ **20 weeks:** Eyebrows and scalp hair become more visible and the baby blinks more often.

The Human Baby

- ◆ **14 weeks:** Ability to move head, mouth, lips, arms, wrists, hands, legs, feet, and toes.
- ◆ **10 weeks:** Brain structure is complete and the brain mass increases rapidly. Socket for all twenty teeth are formed in gums. Face has human appearance.
- ◆ **18 days:** The heart is forming and the eyes are developing





14 weeks



18 weeks
yawning





20 weeks



27 weeks





29 weeks



31 weeks



When Does Life Begin?

Nature, Science Update, 8 July 2002, Helen Pearson
http://www.nature.com/nsu/nsu_pf/020701/020701-12.html

“Your world was shaped in the first 24 hours after conception. Where your head and feet would sprout, and which side would form your back and which your belly, were being defined in the minutes and hours after sperm and egg united.”



When Does Life Begin?

Dr. Alfred Bongioanni, Professor of Obstetrics at the University of Pennsylvania

“I have learned from my earliest medical education that human life begins at the time of conception...”



When Does Life Begin?

Aileen Klass (Owner of Oregon's largest abortion clinic testifying under oath), *Lovejoy Surgicenter v. Advocates for Life Ministries*, 1989.

“Of course human life begins at conception.”



Holy
Bible

The Bible and Life

Thus saith the LORD that
made thee, and formed thee
from the womb

Isaiah 44:2

The Bible and Life

For You formed my inward parts;
You covered me in my mother's
womb. I will praise You, for I am
fearfully *and* wonderfully made;

Ps 139:13-14a

The Bible and Life

According as he hath chosen us in him before the foundation of the world, that we should be holy and without blame before him in love:

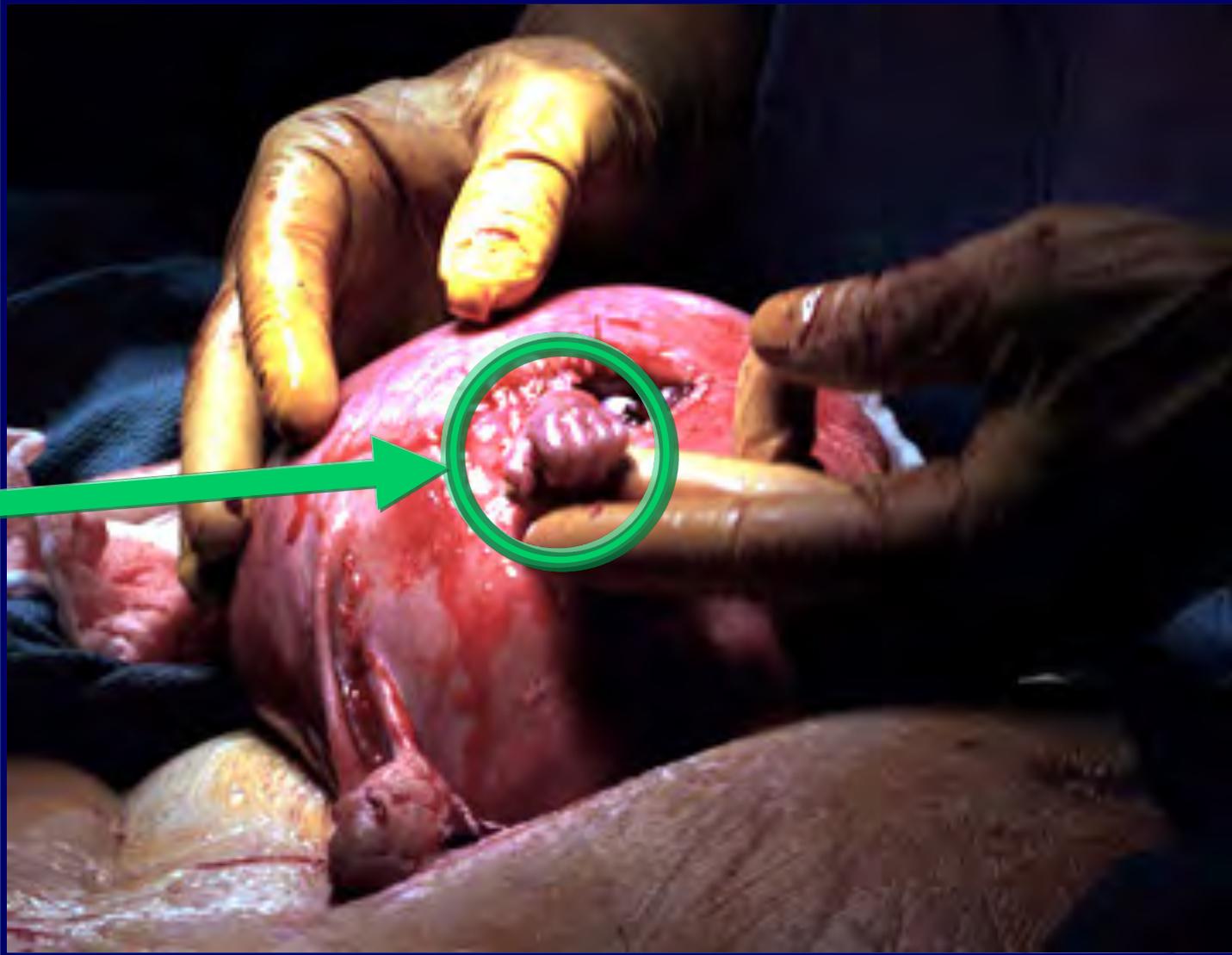
Ephesians 1:4

The Bible and Cloning

- ◆ Exodus 20:13
- ◆ Cloning is in opposition to the Biblical institution of the family



21 Weeks in the Womb



Picture by Michael Clancy, 1999

21 Weeks in the Womb



Picture by Michael Clancy, 1999

Created With Worth

We were created as the climax of God's creation with worth far greater than that of all animals

So God created man in his *own* image, in the image of God created he him; male and female created he them.

Genesis 1:27



The Unborn and God

Psalm 139 paints a graphic picture of the unborn in God's eyes

Your eyes saw my substance, being yet unformed.

And in Your book they all were written,
The days fashioned for me, When as yet there were none of them.

Psalm 139:16



Destruction of Human Life



A hand taken from the discarded remains
of an abortion



Herod Kills the Children

Matthew 2:16

Then Herod, when he saw that he was deceived by the wise men, was exceedingly angry; and he sent forth and put to death all the male children who were in Bethlehem and in all its districts, from two years old and under...

This was a horrifying act



There have been more than 40 million abortions in the thirty-one years since the U.S. Supreme Court legalized unrestricted killing of babies on January 22, 1973

More than 40 million hearts were stopped



Babies Are Human

Something non-human cannot
become human

Therefore

When did the baby become a
human baby?



At Conception



Cloning and Life

What has cloning taught us about when human life begins?

**Human life begins at
conception!**



Cloning Humans

Thomas Murray, Bioethicist and president of the Hastings Center, a bioethics think tank in Garrison, N.Y., from *USA Today*, January 17, 2003.

“It is absolutely inevitable that groups are going to try to clone a human being. But they are going to create a lot of dead and dying babies along the way.”



Human Cloning

House Votes To Prohibit All Human Cloning, Feb., 2003.

The legislation passed 241 to 155, to prohibit the production of cloned human embryos for medical research as well as the creation of cloned babies



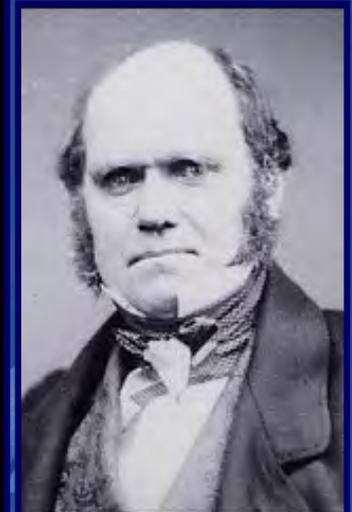
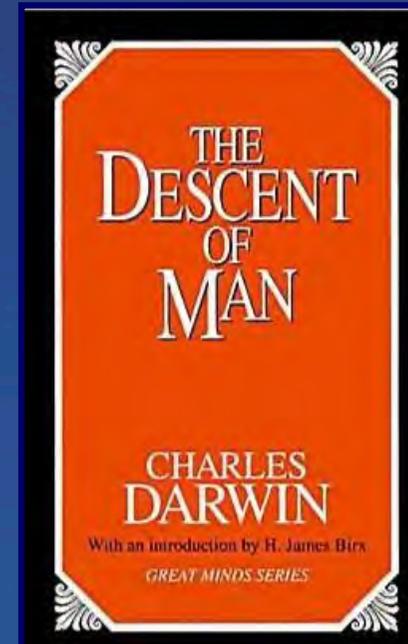
Results of Cloning

- ◆ Dozens of animal clones - including cows, pigs, mice, goats and a cat - have been born since Dolly
- ◆ Many are stillborn and some survive only with severe defects
- ◆ Human clones are more difficult



Cloning and Life

- ◆ Cloning is NOT evolution (requires intelligent engineering) - nothing new was created
- ◆ Cloning proves human life begins at conception
- ◆ Darwin convinced many that humans are a non-special species



The Results of Evolution Teaching

“At some future period, not very distant as measured by centuries, the civilized races of man will almost certainly exterminate and replace the savage races throughout the world.”

(Charles Darwin, *The Descent of Man*)

- ◆ Pro-abortion movement is based largely on evolution thinking (Darwinism)
- ◆ The Bible is consistent that we are a special species (ONE RACE)!



One Blood – One Race

And He has made from one blood every nation of men to dwell on all the face of the earth,...

Acts 17:26

Conclusion

- ◆ All human life has meaning
- ◆ Life begins at conception
- ◆ Science supports creation and Pro-Life
- ◆ Science refutes evolution and Anti-Life



TODAY'S CRITICAL CONCERNS

WHY PRO- LIFE?

Caring for the Unborn
and Their Mothers

RANDY
ALCORN

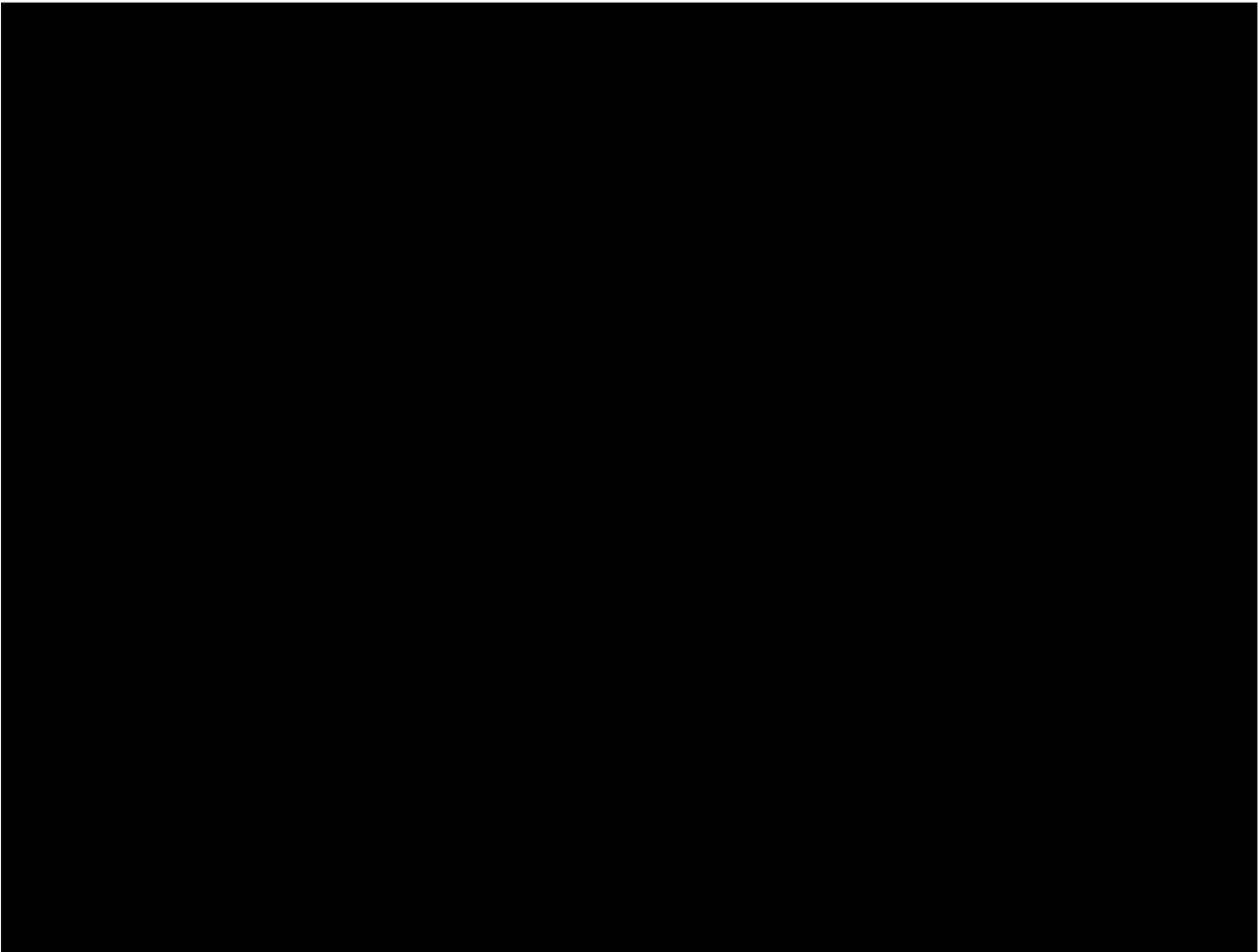


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