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Mitosis: Cell Division

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THE GENETIC MATERIAL CONTAINED ON CHROMOSOMES IS EXTREMELY IMPORTANT TO THE FUNCTION OF EVERY CELL IN THE BODY.

All through development, ***cells*** are growing and dividing. As these ***cells*** divide it is very important to be sure that the genetic material-the chromosomes and genes-are carefully maintained.

When a human cell with 46 chromosomes divides, the tow resulting ***cells*** must have 46 chromosomes each, as did the "mother" or parent cell.

There is a very organized process that occurs in stages that assists in the successful completion of all ***division*** and maintenance of the genetic material.

These stages are outlined below:

Stage 1. INTERPHASE

The interphase stage is one of cell growth and much metabolic activity. The most important event of interphase is the replication or doubling of the chromosomes.

The chromosomes remain attached at the point called the centromere until a later stage.

Stage II. PROPHASE

In the prophase stage the two small structures called centrioles migrate or move to opposite ends of the cell. The nuclear membrane begins to break down and the chromosomes become very condensed.

Fibers called spindle fibers begin to radiate or extend from the centrioles.

Stage III. METAPHASE

In the metaphase stage each doubled chromosome becomes attached to a spindle fiber. This attachment occurs at the centromere of the double chromosome. After this attachment, the chromosomes are lined up at the middle of the cell (the equatorial plate) as shown.

The nuclear membrane has totally disappeared.

Stage IV. ANAPHASE

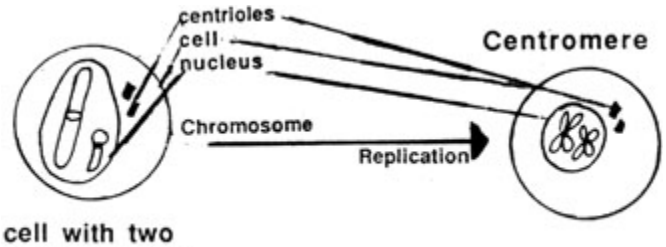
The most critical and precise events in mitosis occur during the anaphase stage. During this phase the doubled chromosomes are separated from each other and are pulled by the spindle fibers to opposite ends of the cell. The movement during anaphase is critical in providing each daughter cell with an identical set of chromosomes.

Stage V. TELOPHASE

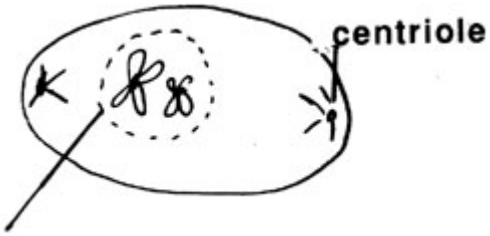
The final stage of mitosis is telophase. During this stage the cell begins to "pinch" into two portions-a process called cytokinesis.

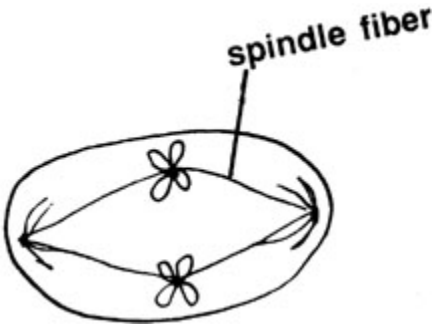
The nuclear membrane reforms and two identical ***cells*** have been produced from the original mother cell

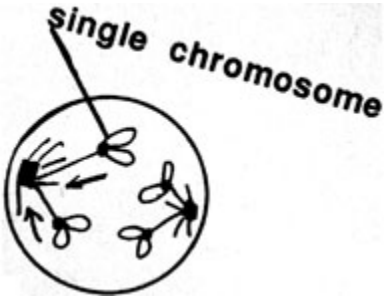
Much investigation is being done in the area of regulation of ***cell division***. There is much more to be learned about this very important process that maintains the genetic material during growth and development.

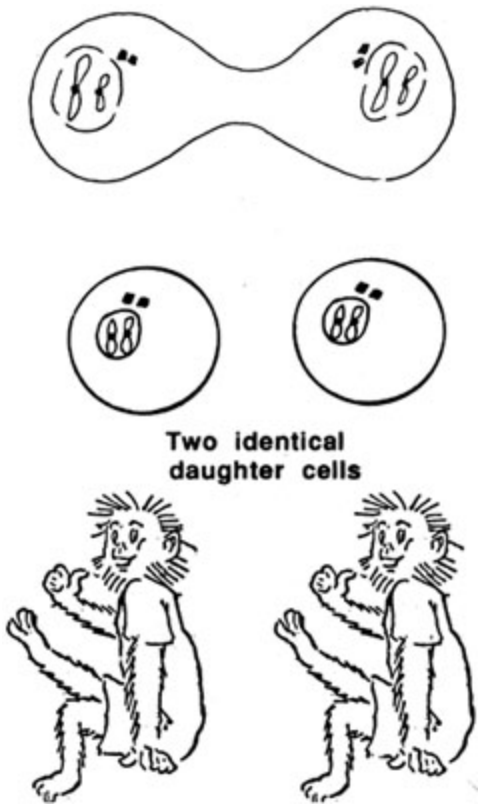


cell with two chromosomes









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