THE CELL CYCLE RAP

by Arthur W. Siebens, Ph.D., Copyright 1999

You began as one cell, called a zygote
So how'd you get to be so big? Just take note
That first cell divided, so then there were two
Those two became four, then eight as you grew
To help you understand that process is our mission
'Cause you've got to have a vision of cell division.

Before we get too far we need to think
About the genes on chromosomes that control everything
Your cells have DNA, DNA makes your genes
And through transcription and translation genes code for proteins
But keeping track of those genes (30,000 to 40,000 in humans) is one of nature's tricks
Cells use chromosomes – humans have 46
Now, when the cell's not dividing, chromosomes are unwound
It's called chromatin, DNA's spread all around*
But when a cell divides, DNA will condense
Into rods called chromosomes – it makes lots of sense
That way you get all your genes – and not any more
Too many, too few – you've got problems in store
There's some birth defects you can detect right away (e.g. Down's syndrome)
In a karyotype, an ordered chromosome display.
Each chromosome has two halves, exactly the same
They're sister chromatids – remember that name
They're held together at the centromere
But not for long as you soon shall hear.

Now, chromosomes come in pairs – you've got 23
One per pair from each parent, most cells are diploid (2N) you see
'Course eggs and sperm have only one from each pair
So fertilization results in chromosome "re-pair"
23 from Mom, 23 from Dad
A zygote's back to 46, then it divides like mad
Now, in all but gametes (eggs, sperm) the nucleus divides through mitosis
There are four stages on which we need to focus:

In prophase through a 'scope you can see chromosomes
The nuclear membrane breaks down, so they can find a new home
In metaphase the chromosomes form a line
It's like they're doin' a dance and they're lookin' real fine
In anaphase the centromere divides
And the chromatids move towards opposite sides
In telophase chromatids (now chromosomes) are at opposite ends
New nuclei form – that's how mitosis happens
Then cytokinesis takes place, the cytoplasm splits
Now you've got two cells – that's just about it.

Except the cell's got to grow, and DNA replicate (in S phase)
Made of G1, S, G2 – it's called interphase
Though mitosis and cytokinesis are more exciting
Through most of the cell cycle the cell's *not* dividing
So that's the cell cycle and all of its parts
Hope this little rap helps you to learn it by heart!

*** In the nucleus in eukaryotes, in the nucleoid region of prokaryotes.**