

# Re: DNA growth... Where and how does this happen?

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*Source:* <http://sci.tech--archive.net/Archive/sci.bio.evolution/2005-08/msg00130.html>

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- *From:* "Perplexed in Peoria" <jimmenegay@xxxxxxxxxxxxxxxx>
  - *Date:* Sun, 7 Aug 2005 01:24:15 -0400 (EDT)
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"MicroTech" <henry@xxxxxxxxxxxxxxxxxxxxxxxx> wrote in message [news:dd39ml\\$10jl\\$1@xxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:dd39ml$10jl$1@xxxxxxxxxxxxxxxxxxxxxxxx)  
> I have scoured countless web pages and read all kinds of books on  
> evolution, genetics, bio/organic chemistry etc etc, but nowhere can I  
> find any references to WHERE in the human system "new" base pairs are  
> added to the mighty DNA double helix, or what triggers the addition of  
> such new "code".

You probably need to look at a textbook on molecular biology. A good one – "Molecular Cell Biology" is available online here:  
<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Books&itool=toolbar>

You will want to look at sections dealing with 'mutation', 'introns', 'tandem repeats', 'chromosome duplication', 'base insertions' and probably other topics as well.

It is important to realize that genomes don't necessarily grow one base at a time. There are processes that result in the duplication of long segments of DNA. Then one or both copies get changed by ordinary mutations.

- > Closely related is the question on which DNA that is
- > used as the "Master" molecule to be copied into the sperm/egg
- > chromosomes: would this not be the only place where "random
- > mutations" could occur?

You will also want to look at 'meiosis' and 'recombination'. You are right that mutations only matter in those cells that are destined to become the predecessors of sperm and egg cells.

- > It seems obvious to me that, on the long and winding path from the
- > first prokaryote DNA to my own personal genome, there has been many new
- > base pairs added over the 3 500 000 000 or so years since the process
- > started (AFASK). Opinions differ on the size of the human genome, but
- > there seems to be an informal consensus around the value 3 500 000 000
- > (nucleotide base pairs)–neat coincidence, an average of one new base
- > pair per year!

Re: DNA growth... Where and how does this happen?

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- > I am \*not\* a creationist (rather, an agnostic, in the true sense of the
- > word). I firmly believe that Darwin is on to something in his "On the
- > Origin of Species." However, I find it more than difficult to envision
- > how "random mutations" (caused by cosmic rays or other radioactivity?)
- > or replication errors could lead to something as immensely complex as
- > Life... at least in such a short time span as 3.6 billion years. Some
- > additional mechanism must, somehow, be at play here, no?

Uh, no. IMHO, no additional mechanism is needed. Though I suspect that the actual mechanisms are a bit more complicated than you currently realize. But you probably didn't mean to get into THAT debate right now.

- > If someone in this group could lead me to where I can read about actual
- > "DNA building and genome growth"—is it something like the
- > high-growth tip of a plant root?—it would be very much appreciated!

I hope the book reference that I have provided helps. Unfortunately, I am unaware of any single resource that addresses the problem in the terms that you are interested in. (Your reference to the coincidence of  $3.5 \times 10^9$  does indeed indicate an average "growth rate" of 1 base pair per year. You are right that an explanation of how this has happened is needed. But I am not aware of any resource that explains it directly and succinctly.)

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• **References:**

- ◆ **[DNA growth... Where and how does this happen?](#)**  
◇ From: MicroTech

- Prev by Date: **[Re: Lizard engines and rat engines](#)**
- Next by Date: **[Re: Humans "unique" social](#)**
- Previous by thread: **[Re: DNA growth... Where and how does this happen?](#)**
- Next by thread: **[Re: DNA growth... Where and how does this happen?](#)**
- Index(es):
  - ◆ **[Date](#)**
  - ◆ **[Thread](#)**