ANIL AGGRAWAL'S
Internet Journal of Forensic Medicine and Toxicology
The world's first online journal devoted entirely to forensic medicine and toxicology · Published 1 January and 1 July

VOL. 3, NO. 1
Downloaded from www.anilaggrawal.com · ISSN 0972-8074 (Online) · https://www.anilaggrawal.com/ij/vol_003_no_001/reviews/pb/page003.html

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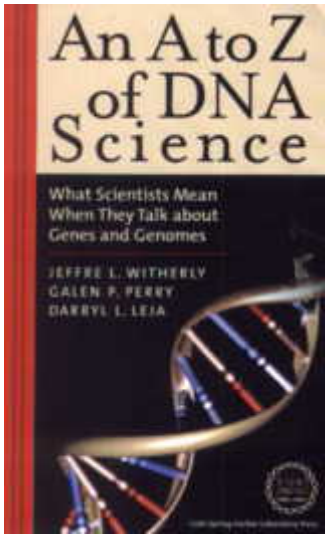
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DNA GLOSSARY

An A to Z of DNA Science *by* Jeffre L. Witherly, Galen P. Perry and Darryl L. Leja
Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York: x + 126 Pages, Published 2001, ISBN 0-87969-600-1 (paperbback): Price $29.00

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ABOUT THE AUTHORS

JEFFRE L. WITHERLY has been creating ways to help the public better understand important medical and scientific principles for over twenty years. His career highlights include hosting a

syndicated radio health show, developing Internet-based learning tools such as the Talking Glossary of Genetics, and creating one of New England's first televised Allergy Indexes. He currently directs science education at the National Human Genome Research Institute.

GALEN P.PERRY's experience in communicating medicine and science to the public comes from having worked in the medical and research field for over a decade. He is currently Deputy Director of the Office of Science Education at the National Institutes of Health's National Human Genome Research Institute in Bethesda, Maryland, where he continues to create novel ways to explain complex scientific terms in a simple, straightforward manner. DARRYL L. LEJA is a graduate of the University of Michigan's MFA program in medical illustration. His illustrations have appeared in numerous scientific journals and a number of the country's leading newspapers and news magazines. He currently directs the scientific illustration unit at the National Human Genome Research Institute, NIH, where he focuses on conceptual visualization for science education and research, including three-dimensional modeling.

What is Alagille Syndrome? What is a Candidate gene? What is a cDNA Library? What do you understand by p53 gene? What is a Yeast Artificial Chromosome? What is a centimorgan? If you want to know the answers to these, and a host of other similar questions relating to DNA, in simple, no-nonsense language, this book is for you.

Written in a dictionary style, this book gives you the meanings of about hundred different terms related to DNA. Most entries occupy one page, but a few (such as "Base pair", and "chromosome") are explained in two pages. Almost all entries are explained with the help of clear crisp diagrams.

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The definition of the term appears first, and a more detailed explanation follows in italics. A special feature is an entry called "Related terms", so you can hop off to other similar terms to clarify the meaning of the word further. The related terms are arranged in such a manner that no matter where you start from, you end up reading the whole book.

I read the book completely in about 3 sittings. And the book was so gripping, I never knew how time passed. And by the time, I was through, I knew my DNA basics much better.

The answers to the above questions? Alagille Syndrome is a rare inherited liver disorder seen in infants and young children. In this disease, there is a build up of bile in the liver because of the deficiency or absence of normal bile ducts inside the liver and a narrowing of bile ducts outside the liver. A candidate gene is one which is suspected of being involved in a disease. Its protein product suggests that it could be the cause of disease in question. The 'c' in cDNA stands for "complementary". A cDNA library is a collection of DNA sequences generated from mRNA sequences. This type of library contains only protein-coding DNA (genes) and does not include any non-coding DNA. p53 gene is the one which regulates cell cycle and protects the cell from damage to its genome. When cells suffer damage, the p53 gene activates, stopping the cell cycle.

It allows DNA repair to occur. If however the damage is too extensive to be repaired, p53 gene sends a signal to the cell to self-destruct itself to avoid replication. If replication of such cells is allowed to occur, it may result in cancer, which is what results, when p53 gene stops functioning.

Some Excerpts

The following information appears on page 97 of the book.



Polydactyly
An abnormality in which a person is born with more than the normal number of fingers or toes.

Polydactyly produces a malformation that affects the hands, or feet, in various ways. This may occur on the big toe or thumb-side of the limb, on the little toe, or pinky-side of the hand, or anywhere in between.

Yeast Artificial Chromosome or YAC? It is an extremely large segment of DNA from another species incorporated into the DNA of yeast. Why would one want to do that? Well, it is done when scientists want to clone foreign DNA (of up to one million bases or even longer). So when yeast cell duplicates, the "foreign DNA" gets duplicated too. If scientists want to clone smaller strands of DNA (of about 100,000 to 200,000 bases), they are introduced into bacteria, and these are called Bacterial Artificial Chromosome or BAC. Typically BACs are much smaller than YACs. Centimorgan is a measure of genetic distance that tells how far apart two genes are. Generally one centimorgan equals about 1 million base pairs. It is also the distance, two genes are apart, if there is a 1% chance that there will be a crossover between those two loci during meiosis. If the genes are sitting at the opposite poles of a chromosome, there is 100% chance of crossover, and the distance would be 100 centimorgans, or one morgan. So by definition, one chromosome is about one morgan in length.

The book should be useful to students of biology, genetics and DNA science. Adults having little or no background in biology, and wanting to understand the language of DNA would find this book extremely useful. With the Human Genome Project everywhere in the news, those who want to follow the media news better would find it a useful companion. The book is plain fun to read, even if you have none of these goals in mind.

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