Drugs, the human genome, and individual-based medicine

By Jay A. Glasel

Global Scientific Consulting LLC
15 Colton St.
Farmington, CT 06032, USA
<jaglasel@consult-globalsci.com>
Summary

The so-called “Genomic Revolution” has made possible the high-resolution sequencing of the DNA making up the human genome. One of the main conclusions of the currently available sequencing data is that individuals differ genetically from one another via sequence variations in their genomes. When affected genes are transcribed and translated, some of these sequence variations result in protein products that may affect the functioning of the proteins. This has led to widespread optimism that information on an individual’s pattern of sequence variations will lead to drugs that target that individual’s variant proteins and make “individual-based medicine” possible. In this chapter some of the assumptions underlying the proposed production of individual drug treatments are examined. The assumptions are viewed in the light of very recent experimental evidence about the sequence patterns found in humans. Also discussed are ancillary ethical problems in cataloging and using databases containing individuals’ sequence data, what human genomic sequences are revealing about the use of animal models in developing drugs, and how evidence is mounting that the human genome is only one element serving to maintain an organism’s interaction with its environment.