

Book Review

Personalized Medicine: Promises and Pitfalls

G. Gronowicz. CRC Press, Boca Raton, FL. 2016

pp 212, 44 figures, 8 tables. Hardcover. IBN 13-978-1-4987-1491-4

Amazing advances have been made in science to improve medical care in the twenty-first century with the development of genomics as well as pharmaceuticals that have been developed from proteomics and botanical products. Personalized medicine generally seeks to identify the genetic, phenotypic, or environmental factors that influence a person's health risks. This book is not an exhaustive analysis of personalized medicine or the complete science behind it but is colored by author's personal experiences as a breast cancer survivor in a healthcare center of medicine, education, and research.

The book starts with introduction and ends with conclusion and includes eleven chapters dealing with genetics, proteomics, epigenetics, integrative medicine, placebo effect, stem cells, scientific studies and clinical trials, medical training for personalized medicine, healthcare and drug costs, and ethics. Each chapter starts with a brief course to introduce the terms, concepts, and essential facts for understanding the subjects. Many chapters include personal stories and individual medical cases. The references in each chapter are updated. There are only 44 figures in black and white color, and 8 tables are helpful for understanding the subject. The glossary of scientific terms as well as the index are very useful.

With the basic knowledge of genes, DNA and processes of DNA replication, transcription, and translation, we see how these biological processes contribute to the personal genetics of each person and also to their family history. The author believe that scientists will forever continue to learn about the complex patterns of gene and protein expression which can lead to disease, and also that we are far from achieving the goal of personalized medicine due to the complexity of each person's physiology. Proteomics/proteins are important to personalized medicine since sick and cancer as well as normal cells express

specific proteins on their surfaces and inside the cell that reflect a cell's activities and health. Analysis of the proteins holds the promise that we can identify biomarkers that are unique early in the disease process. The DNA profile of our genes is further complicated by epigenetics, which are inherited changes in DNA expression that occur in the absence of change in the primary DNA sequence. Nutrition affects every aspect of our lives and can influence the development and outcomes of disease. It is a part of integrative medicine, and many of the topics in integrative medicine are part of the domain of complementary and alternative medicine. Physical activity is extremely important for reducing high blood pressure and preventing weight gain. Exercise can cause epigenetic modification to the DNA. Integrative medicine therapy is effective for a particular medical condition. Combining allopathic medicine with evidence-based integrative medicine may be helpful to many people. A placebo effect in medicine can be defined as a substance or a procedure that is administered to a person or animal that elicits an effect but does not have any specific pharmacological activity for the condition being tested. It appears that the placebo effect is part of our normal physiology and needs to be considered as a component of medical treatment.

Advances in stem cell research have given new promise for personalizing cell or organ therapies for human diseases. The author feels that we need to rely on different types of scientific studies from cells, animals, and humans in order to understand the best treatments for patients. Personalizing medicine makes it more difficult, since conclusions on best medical practice can be difficult to assess from studies on individuals or small groups of patients with the tools available at present time. Medical education is lagging behind the rapid advances in the sciences of genomics, epigenetics, proteomics, integrative medicine, etc., upon which personalized medicine is based. It is hoped that the pitfalls in simply analyzing a patient's genes for mutations or for diseases are presented to doctors in training. A promising trend in the medical world is that healthcare costs have slowed substantially in every high income nation. It is only logical to think that the development of drugs for a small group of patients or individual patients will increase costs. The reimbursement to physicians and hospitals is beginning to be tied to outcomes of medical treatments. It appears that personalized medicine

and healthcare costs are on a collision course. Ethics are an important cornerstone of human civilization and are critical in medicine and research. Predictive tests for disease susceptibility in personalized medicine can negatively influence a patient's sense of well-being, and personalized therapeutic measures may also cause an ethical dilemma leading to unequal access to a particular therapy.

This book meets the author's goal to explain the science behind personalized medicine, what impact it may have on specific diseases, and some of the repercussions of a personalized medical approach on our medical institutions. By explaining broad topics in personalized medicine, the reader can discover how personalized medicine makes a positive impact on an individual's health. The book is relatively easy to read and timely important in medical practice. I highly recommend it to medical students, medical and surgical trainees as well as practitioners.

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