Personalizing Precision Medicine
A Global Voyage from Vision to Reality

By Kristin Ciriello Pothier
Imagine a world where a person's genes can be analyzed to help doctors provide a personalized treatment for that individual. That world is here, and it's possible because of the power of precision medicine. *Personalizing Precision Medicine* explains it all, from the basic science to compelling, personal stories that make the science come to life.

This should be your first read if you are:

- A business leader interested in how to navigate the precision medicine space
- A friend supporting a loved one with a cancer diagnosis
- An educator trying to explain medical complexity today
- Someone curious about how the explosion of personalized data and the convergence of historically separate stakeholders have transformed the global health care landscape for the healthy and the ill

Here, both the science and the human impact of precision medicine are united in a single, approachable volume.
**What is precision medicine?**

Every person has two copies of each gene, one inherited from each parent. Most genes are the same in all people, but a small number of genes (<1% of the total) are slightly different from person to person. These small differences contribute to each person's unique physical features but can also contribute to diseases. For example, mutations in some genes can increase a person's risk of developing cancer, and a patient with these mutations is most likely to respond to treatments that target those mutations. Health care providers can use genetic testing and other kinds of testing to understand the causes of an individual patient's disease, then utilize the test results to deliver the right treatment to the right patient at the right time. This is the power of precision medicine.

**Global access to precision medicine**

While great strides have been made, even today, many of the leading drugs in the United States only benefit 4% to 25% of patients—think about the high cost of medicines that have little or no effect and the side effects that many patients must endure while seeing no benefits. Precision medicine tailored to the requirements of individual patients' not only benefits those patients but also can help to limit costs within the health care system as a whole.

This benefit applies not only to the U.S. but globally. *Personalizing Precision Medicine* highlights countries, such as Brazil, Saudi Arabia and China, among others, that may have as few as one-third the number of precision medicines available versus the U.S. and EU. This book explores how increasing access to targeted treatment and precision modalities within these regions is a priority for companies, global non-governmental organizations (NGO), nonprofit organizations, medical centers and public-private partnerships.

**Investing in the present and future of precision medicine**

Precision medicine is a multibillion dollar industry encompassing pharmaceuticals, diagnostics and services around the world. Investors are excited about precision medicine and the technologies that can advance precision medicine, from artificial intelligence (AI) to cancer vaccines to consumer diagnostics.

Modern technologies continue to evolve to both allow people to personally improve their own health and provide researchers with new tools to advance precision medicine worldwide. *Investors are incredibly excited about these emerging technologies, as evidenced by the investment of over $600 million of venture capital funding alone within consumer diagnostics since 2014. Examples of such technological advances are listed below.*

- DNA sequencing technology has allowed us to sequence a human's entire genome for less than $1,000.
- AI has helped researchers make sense of health- and lifestyle-related data and is starting to help physicians and patients decide which treatment will be most effective.
- Consumer test kits can now make personalized food recommendations based on the bacteria in each person's stomach.
- Sensors can monitor exercisers' performance, atmospheric conditions and drag coefficients to notify them if they are overexerting themselves to help prevent an injury before it even occurs.
- Additionally, groundbreaking science could enable us to treat cancer with a patient's own cells— with untold impact on reducing human disease.

*Personalizing Precision Medicine* explains why it is imperative that there is ongoing research, investment and collaboration in precision medicine, as the results can truly revolutionize health care and save millions of lives across the globe. *Personalizing Precision Medicine* can serve as a foundation to ensure that readers from all backgrounds have a thorough understanding of both the triumphs and challenges that remain as precision medicine continues to improve health care for all.

To learn more about the book, *Personalizing Precision Medicine*, visit parthenon.ey.com
About the author

Kristin Ciriello Pothier is the Global Head of Life Sciences for the Parthenon-EY practice of Ernst & Young LLP and the creator of EY Precision Medicine™. She has over 20 years of experience in management consulting and research in the life sciences industry. She is a noted speaker, workshop leader and writer in life sciences. She is also a clinical laboratory and life sciences innovation expert, helping develop product and service strategies worldwide for investors, corporations and medical institutions. Earlier in her career, Kristin was a partner and owner of Health Advances, a health care consulting firm, and a research scientist at Genome Therapeutics and at Genzyme. She earned a BA in Biochemistry from Smith College and an MS in Epidemiology, Health Management, and Maternal and Child Health from the Harvard School of Public Health.