GENETIC DARK MATTER:
FUNCTIONAL MEDICINE DECODES THE FORCE WITHIN

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General Overview:
Medicine is evolving because of people like Jeffrey Bland. In the early 1990s, Dr. Bland coined the term “Functional Medicine” and founded an educational organization he called the Institute for Functional Medicine. Functional Medicine is an evidence-based and individualized approach to patient care—one that Dr. Bland saw as an operating system that could bridge the divide between traditional molecular medicine and the emerging field of integrative medicine. Today, advancement of the Functional Medicine concept has become a worldwide movement. Technology, new research, and even sociopolitical factors—the Internet as everyone’s primary information source, President Obama’s Precision Medicine Initiative, direct-to-consumer advertising and testing kits—are all driving a demand for better and more personalized information, especially in the field of genomics. In his presentation Genetic Dark Matter: Functional Medicine Decodes the Force Within, Dr. Bland will explore some of the latest and most cutting edge research emerging today—and he will explain how Functional Medicine is the framework both practitioners and patients need to make sense of 21st-century medicine.

Discussion Questions

- Genes + Environment = Function. This equation is a linchpin for understanding why genomics is—and will continue to be—a key factor in 21st-century medicine. The Functional Medicine operating system currently offers strategies for applying this concept to the management of individual patients. Discuss how.
  - GOTOIT: In the “Gather” step, Functional Medicine clinicians go far beyond conventional training as far as medical history-taking to determine the preconception, intrauterine, past, and current “environment” of the individual patient which influences gene expression.
  - IFM teaches clinicians to gather ATMs and MLFs (the roots of the Functional Medicine Tree) which indicate genetic issues and epigenetic influences that ultimately affect physiological function.

- Although whole-genome sequencing is available, the cost remains out of reach for most people and interpretation of the data such an analysis produces is daunting. Most individuals are opting for analyses that focus on SNPs. Is this information being overused for diagnosis? How does learning more about genetic dark matter and the vast amounts of information that might be contained in the hidden code affect your perception of SNP data?
  - Individual SNPs by themselves rarely confer significant changes in function.
  - Patterns of SNPs will be more clinically useful and predictive.
  - Genetic dark matter is that which determines whether or not genes are expressed, and therefore whether or not SNPs in any given individual will have a deleterious or positive effect on physiological function.
• IFM teaches interventions that affect the genetic dark matter (gene expression), which can mitigate the effects of potentially harmful SNPs.

• Presently, clinicians often use biomarkers as a measurement of function. Can biomarkers provide any insight into what is going on within the genetic dark matter? Do you typically measure telomere length in patients? In what situations? Measuring metabolomics and proteomics may be standard of care in the near future. Discuss how information that reaches beyond biomarkers can be incorporated into patient care both now and in the future.
  • Biomarkers can be indicators of gene expression (insight into dark matter).
  • One critical issue in the clinical application of metabolomics and proteomics will be to discern which biomarkers are risk factors (causative, etiologies, upstream) vs risk markers (associative, effects, downstream)

• What are the presently actionable clinical opportunities provided by the genomics revolution for the Functional Medicine practitioner?
  • Nutritional interventions and supplementation with epigenetic effects.
  • Behavioral/lifestyle interventions with epigenetic effects.
  • Microbiome interventions.
  • Proteomic and metabolomics as a basis for diagnostic testing.

• What is needed to make this evolution in understanding of the importance of the genetic dark matter more clinically applicable?
  • Research on factors (especially nutritional/lifestyle) that regulate gene expression.
  • Improved diagnostic assessments to determine the outcome of interventions.

• How can a patient be empowered to apply Functional Medicine in their lives and improve their health by integrating genomic information into their personalized program?
  • This hinges on how well the FM clinician follows the GOTOIT methodology, how s/he TELLS the patient’s story, and how s/he engenders the therapeutic partnership.