

METABOLOMICS IN 2020

Jeremy K. Nicholson

Head, Department of Surgery and Cancer, Imperial College London

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The analysis of the chemical fingerprints left by metabolic processes has already started to play a crucial part in personalized medicine, particularly cancer therapy. This stems from the understanding that humans are metabolic superorganisms carrying the genomes of many symbiotic organisms, all of which can affect an individual's physiology. Human metabolism is heavily influenced by interactions between our own genes and the activities of gut microbes, as well as by diet and environmental stressors. The products of this metabolic interplay have a direct influence on susceptibility to disease.

Determining how the body's metabolic processes interact with those of gut microbes is a priority in the coming years, because many conditions, including ulcerative colitis, Crohn's disease, obesity, diabetes and autoimmune disorders, are linked to poor gut health and microbial imbalances. By 2020, personalized health care could involve doctors monitoring the metabolic activities of a patient's gut microbes and, possibly, modulating them therapeutically. The use of mathematical models to interpret metabolic data obtained using nuclear magnetic resonance spectroscopy and mass spectrometry will help us to understand the changing patterns of human disease on a global scale, and generate new targets for drug or nutritional interventions.