

DATE:
Friday,
17 October 2008

VENUE:
Centre for Life Sciences
Auditorium, Level 1

TIME:
12.00nn - 1.00 pm



Beyond Bench to Bedside

Dr John D Potter

Fred Hutchinson Cancer Research Center;
University of Washington, School of Public Health & Community Medicine, USA
Cancer Research UK, Cambridge Research Institute, Cambridge, England

Host: Professor Chia Kee Seng
Programme Leader, LSI Molecular Epidemiology Programme
Director, NUS-GIS Centre for Molecular Epidemiology
Professor, Dept of Community, Occupational and Family Medicine, NUS

Biography

John D. Potter, MBBS, PhD is a Member and Senior Advisor of the Fred Hutchinson Cancer Research Center (FHCRC) and Professor of Epidemiology, University of Washington School of Public Health & Community Medicine, both in Seattle, Washington, USA. He also has a visiting appointment at the Cambridge Research Institute. Dr Potter received his medical degree in 1971 and his Ph.D. in 1984 from the University of Queensland in Australia. He worked at CSIRO Division of Human Nutrition, Adelaide from 1977 to 1986, with a small period at the University of Adelaide in that time span. He was on the faculty of the University of Minnesota's School of Public Health for eight years from 1986 before joining the Fred Hutchinson Cancer Research Center as the head of Cancer Prevention Research and the University of Washington as professor of epidemiology in 1994. From 2002 to 2007, Dr Potter was the Director of the Hutchinson Center's Division of Public Health Sciences, the largest program devoted to cancer-prevention research in any Cancer Center in the world. He works mostly on the connections between cancer and factors such as diet, lifestyle, and genetics. The primary focus of his research is the etiology and prevention of gastrointestinal neoplasia; he has long been involved in studies aimed at understanding risk and intermediate biology in pancreas and colorectal cancer, at developing usable biomarkers for screening and early detection, and at monitoring cancer progression in high-risk individuals. Between 1993 and 1997, Dr Potter chaired an international panel that produced "Food, Nutrition, and the Prevention of Cancer: A Global Perspective," a seminal report on the feasibility of reducing cancer incidence through diet and other environmental factors. Along with Dr Keun-Young Yoo of the Seoul National University in Korea, Dr Potter leads the Asia Cohort Consortium. This project is planned to involve over 1 million participants. He is also Senior Advisor to, and Chair of the Governing Committee of, the Tomorrow Project, a study that will involve about 300,000 people across Canada. The findings of both of these cohort studies will help generate new ways to prevent cancer and reduce cancer risks for all. His international awards include the American Association for Cancer Research's DeWitt Goodman Lectureship for international leadership in research in nutrition, cancer, and cancer prevention, and India's Gopalan Oration Gold Medal for outstanding contributions in the field of nutrition science. Dr Potter is the author or co-author of over 450 scientific papers, chapters and books.

Abstract

Epidemiology involves the study of populations in order to identify patterns of diseases and their causes across time, place, and person. Epidemiologists study infectious diseases in order to determine and understand causative organisms, the way in which those organisms are transmitted, and who is susceptible. In a related way, but often on a much longer timeline, epidemiologists study chronic diseases, such as cancer, in order to determine and understand the nature of causal exposures, the way in which genetics, age, sex, ethnicity, and many other factors alter susceptibility and resistance to these causal exposures, and what steps might be taken to prevent disease or diagnose and treat it in its early stages.

One of the most effective ways to undertake this sort of investigation is to establish a very large population study, in which healthy individuals are first enrolled and specific baseline data collected; these people, with their full consent and participation, are then followed over time to understand the relationship between these measured exposures and diseases that they may develop many years later. Such studies (called cohort studies) have historically focused on exposure (and genetics) in relation to disease endpoints. However, with the rapid advances in human biology over the last 20 years, there are now many other steps that can be taken in order to provide crucial information on the causes, prevention, early detection, pathology, and treatment of human disease. With an increasingly clear picture of the human genome, we are approaching a time when we will be able to characterize human genetics, essentially to any degree of fine detail – allowing us to understand better, both who is susceptible to certain exposures and diseases and who is genetically resistant. In a similar manner, we are increasingly able to closely characterize disease entities (what geneticists call phenotypes) although this is still markedly more difficult. Nonetheless, we now have increasingly better tools for cancer, for instance, that will move us closer to a 21st century molecular-classification system that could replace the microscopic histopathology that we inherited from the 19th century. Such molecularly defined disease subsets can be related to prior events (exposure, genetics) as well as to outcome (treatment response and survival) in ways that can inform more effective diagnosis, and better-targeted treatment. Meanwhile, the collection of repeated specimens (blood, urine, cells from specific organs) from the study members and the exploration of these using new high-throughput biologic tools will improve our capacity to detect disease, especially cancer, early, and thus reduce the mortality and the suffering frequently associated with late diagnosis. To attempt to establish the complete pattern of human disease susceptibility and resistance, to identify precise disease subsets (and thus better focus treatment), and to establish whether there are specific patterns in biologic fluids and specimens that can act as early warning signs, we need a very large number of individuals who are well characterized genetically, whose exposures are well mapped, and whose illness patterns, therapy responses, and treatment outcomes can be monitored. This describes a very large, diverse cohort on whom we have a substantial exposure history, family history, blood, etc., and the capacity to follow up over a long time period for diseases (and subsets of diseases) that we wish to control.

With our steadily increasing understanding of human biology come better and more targeted approaches to the treatment of human disease. However, treatment is always late in the process and always the most expensive option. As with the prevention of infectious disease (hygiene, vaccine and quarantine), the prevention and early detection of chronic disease will prove to be cheaper, more effective, and less of a burden than treatment. Thus, in order to improve our understanding of causes and in order to apply that understanding to best prevention practices, we must go beyond "bench-to-bedside" and out into the population.

ALL ARE WELCOME

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