

Pragmatic cancer approach – time to change?

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Cancer is the one of the most important public health problems in recent years [1]. It is only over the past 40 years since the passing of the national Cancer Act in 1971 in the US and the spending of hundreds of billions dollars, that the mortality rate of many cancers is at a level similar to that in 1930 (even when corrected for age) or somewhat declining [1–3]. Declining is largely a result of earlier detection (cancer of the cervix, breast and colorectal cancer). Similarly, recent changes in mortality from lung cancer are certainly due to decreases in smoking patterns over the past few decades. The observed trends may largely reflect changing incidence or earlier detection, rather than improved therapy [4].

In the last half a century, some topics have become fashionable in cancer research, and most cancer research resources are directed to these topics. First, the fashion was on “oncogenes” [5]. This, after a long delay, was displaced by tumor-suppressor genes. The mentioned trends of cancer fashion was followed by others such as cell cycle gene mutation, apoptosis, aneuploidy, angiogenesis [4] and lastly “bad luck” [5–7].

According to WHO, early detection of cancer greatly increases the chances for successful treatment [8]. Recognizing possible warning signs of cancer and taking prompt action leads to early diagnosis and early diagnosis is particularly relevant for cancers of the breast, cervix, mouth, larynx, colon and rectum, and skin. Screening refers to the use of simple tests across a healthy population in order to identify individuals who have disease, but do not as yet have symptoms [8]. Examples include breast cancer screening using mammography and cervical cancer screening using cytology screening methods, including Pap smears [9].

A huge US project (US\$100-million) to genetically profile 10,000 tumors started in 2006. In 2009, this project received an additional \$275 million [3]. The Cancer Genome Atlas (TCGA) is now the biggest component of the International Cancer Genome Consortium, a collaboration of scientists from 16 nations

that has discovered nearly 10 million cancer-related mutations. Complexity of the data is the first problem of the project. Other problems are the lack of common mutations among tumors and cancer cells are often quick to become resistant, typically by activating different genes to bypass driver mutations that are blocked by targeted treatment [5]. Recently it was pointed out that cancer profiling may underestimate that two cancer cell clones may look identical yet differ completely at the protein level [10]. In summary, this project has not succeeded in winning the fight against cancer, despite the high amount of resources spent [11,12].

Meaning of “pragmatic” is “Dealing with things sensibly and realistically in a way that is based on practical rather than theoretical considerations” [13]. Pragmatic thought largely developed in late 19th and early 20th century United States by the likes of C.S. Peirce, William James, John Dewey and others [14]. The key to the pragmatic method is a commitment to end-causes and outcomes of practice, rather than abstract first-causes [15]. Pragmatism has influenced the study of law, education, political and social theory, art and science [16]. Pragmatic researchers seek to determine the effectiveness of an intervention in a real-world setting to inform clinical decision making [17]. The pragmatic approach to science involves using the method which appears best suited to solve the problem. May be, the successful HIV/AIDS program serves as a global model of pragmatic medicine in operation [17].

In conclusion, we still do not have a valid hypothesis about carcinogenesis [3,5]. Because of this, accumulation of large amounts of genomic data does not work in everyday clinical practice so far [3]. As stated by Poincare “*Science is built of facts the way a house is built of bricks: but an accumulation of facts is no more science than a pile of bricks is a house*”. Also, the “*foundation of science is trust, which is earned, not given*” [18].

If we spend our effort and energy on the early detection of cancer instead of producing vast amount of genomic data [19], we can be more successful in the battle with cancer.

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Conflict of interest

The author declares that he has no conflicts of interest in relation to this article.

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