

S2. A Favorable View: Progress in Cancer Prevention

P. Greenwald

National Cancer Institute, Division of Cancer Prevention, Bethesda MD, United States of America

Clifton Leaf, in his article on the War on Cancer, presents some valid criticisms of past research approaches and the small impact of this research thus far on producing "cures" or substantially extending the life of many cancer patients. It is true that gains in long-term survival for people with advanced cancers have been modest, hindered in part by the heterogeneity of tumors, which allows the cancers to persist using alternate molecular pathways and evade many cancer therapeutics. In contrast, clinical trials have demonstrated that it is possible to reduce the incidence or improve cancer survival through prevention and early detection. Strides have been made in preventing or detecting early the four deadliest cancers in the United States (i.e., lung, breast, prostate, and colo-rectal). For example, seven-year followup data from the Breast Cancer Prevention Trial (BCPT) provides evidence that tamoxifen reduces by over 40 percent the occurrence of invasive breast tumors; recent studies using aromatase inhibitors and raloxifene also are promising. The Prostate Cancer Prevention Trial (PCPT) showed that finasteride reduced prostate cancer incidence by 25 percent, and the ongoing Selenium and Vitamin E Cancer Prevention Trial (SELECT) is investigating selenium and vitamin E for prostate cancer prevention based on encouraging results from earlier studies. Living a healthy lifestyle, including physical activity, avoiding obesity, and eating primarily a plant-based diet has been associated with a lower risk of colo-rectal cancer, and non-invasive stool DNA tests for early detection are being studied which may lessen the reluctance of people to be screened for colo-rectal polyps and cancer. Behavioral and medical approaches for smoking prevention are ways to reduce the incidence of lung cancer, with antinicotine vaccines on the horizon that may help former smokers to avoid relapse. The U.S. National Lung Screening Trial is testing whether early

detection via spiral CT screening will reduce lung cancer mortality. Prevention and early earlier detection offer efficient and practical strategies to reduce the cancer burden.

Several of the suggestions Mr. Leaf makes, such as developing interdisciplinary collaborations and allocating resources to research earlier in the process of carcinogenesis, have become an integral strategy in the National Cancer Institute's (NCI) approach in the past decade, specifically in the realm of cancer prevention and early detection. For example, an aggressive program to identify biomarkers for earlier detection of cancer – the NCI's Early Detection Research Detection (EDRN) – has identified three promising biomarkers since its establishment in 2000. It collaborates with the National Institute of Standards and Technology to develop validation standards, and to identify the best technologies to use for systematic investigations. If these biomarkers can be validated, they may help to reduce cancer mortality.

References

- [1] Leaf C. Why we're losing the war on cancer. Fortune Magazine. March 22, 2004, pp. 77-92
- [2] Greenwald P. Cancer prevention clinical trials. J Clin Oncol. 2002;20(18 Suppl):14S-22S
- [3] Fisher B et al. Tamoxifen for the prevention of breast cancer: current status of the National Surgical Adjuvant Breast and Bowel Project P-1 study. J Natl Cancer Inst 2005; 97:1652-62
- [4] Callee EE et al. Overweight, obesity, and mortality from cancer in a prospectively studied cohort of US adults. N Engl J Med. 2003; 348:1625-1638
- [5] Church TR. Chest radiography as the comparison for spiral CT in the National Lung Screening Trial. Acad Radiol. 2003; 10:713-715
- [6] Srivastava S, Krueger K, Johnsey D. The Early Detection Research Network, Third Report, Division of Cancer Prevention, Natl Cancer Inst, March 2005