1. CRP as a Lung Cancer Biomarker —The Allin Study

C-reactive protein has found utility as a prognostic marker for a number of cancers, including liver cancer, lung cancer, and melanoma, as detailed below. Allin et al. (111) conducted an epidemiological study of 10,408 cancer-free Danish people. The authors acquired baseline plasma CRP levels, and followed the subjects for 16 years. Of all the subjects, 1624 developed cancer. The study excluded subjects who, at any time before or during the study, had cirrhosis of the liver. The authors divided baseline CRP into three groups, that is, low (under 1.0 mg/L), medium (1.0–3.0 mg/L), and high (over 3.0 mg/L). The authors discovered a significant association between elevated CRP (at baseline) with later development of lung cancer. Greater levels of baseline CRP were progressively associated with greater risk for lung cancer. The authors proposed that the association could be the result of undetected cancer (at baseline) where inflammation around the cancer caused expression of IL-6, where this IL-6 provoked hepatic expression of CRP. The authors also proposed that tumor cells could have been expressing the IL-6.

2. CRP as a Liver Cancer Biomarker —The Wong Study

This concerns surgery on the liver to remove metastatic tumors originating from colorectal cancer. Surgery is the standard treatment for this type of liver cancer. With surgery, liver cancer recurs in two-thirds of patients. Wong et al. (112) took plasma samples 1 day before liver surgery and measured plasma CRP. After surgery, patients were then followed for a prolonged period of time, where the median time of follow-up was 28 months. The authors found that elevated CRP was correlated with worse survival, and that normal CRP was correlated with better survival. Median survival of high CRP patients was 19 months, while median survival of normal-level CRP patients was 42.8 months ($P = 0.004$). The authors proposed that increased CRP was the result of greater nonspecific inflammation occurring in livers having a greater tumor burden.

The authors were careful to point out that there is an inverse relation between CRP and infiltration of tumors by lymphocytes. It should also be apparent, from the studies described in this chapter, that high CRP can mean poor prognosis, while high infiltration by lymphocytes of tumors can indicate favorable prognosis. The former parameter (CRP) reflects nonspecific immune response, while the latter parameter (infiltration) reflects antigen-specific immune response (113). In other words, a reader finding the opposite prognostic values of CRP and tumor infiltration to be contradictory, needs to realize that one reflects nonspecific immunity while the other reflects specific immunity.

3. CRP as a Melanoma Marker —The Findeisen Study

Melanoma, once metastasized, is an aggressive disease with a very poor prognosis.

[111]Allin KH, Bojesen SE, Nordestgaard BG. Baseline C-reactive protein is associated with incident cancer and survival in patients with cancer. J. Clin. Oncol. 2009;27:2217–24.

[112]Wong VK, Malik HZ, Hamady ZZ, et al. C-reactive protein as a predictor of prognosis following curative resection for colorectal liver metastases. Br. J. Cancer 2007;96:222–5.

[113]Canna K, McArdle PA, McMillan DC, et al. The relationship between tumour T-lymphocyte infiltration, the systemic inflammatory response and survival in patients undergoing curative resection for colorectal cancer. Br. J. Cancer 2005;92:651–4.