BASIC RESEARCH

New Tumor Antigen, Cyclin B1, Is Candidate for Cancer Vaccine Development

Researchers at the University of Pittsburgh School of Medicine reported finding a new tumor antigen, cyclin B1, that may be used in developing a tumor-specific cancer vaccine for breast cancer, lung cancer, and head and neck cancer. Their research is reported in the Journal of Experimental Medicine (Vol. 194, pp. 1313–1323). Cyclin B1 is an important protein for regulating cell growth and proliferation. The study shows that cyclin B1 is overexpressed in breast, lung, and head and neck cancer cells but not in normal cells. Memory T cells from patients with breast cancer were shown to respond to the cyclin B1 peptide. Furthermore, when healthy immune cells were exposed in vitro to dendritic cells (i.e., circulating immune cells that recognize and process antigens) containing peptides from breast cancer cells, the immune response was generated by cyclin B1 on the dendritic cells.

New Analysis Method Shows Increased Sensitivity for Prostate Specific Antigen Molecular Forms

Researchers at Roswell Park Cancer Institute in Buffalo, NY, have developed a method that permits identification of previously unknown forms of prostate specific antigen (PSA). Their work is reported in The Prostate (Vol. 50, No. 3, pp. 145–153). Tests for PSA levels help to diagnose prostate cancer before symptoms develop. However, current methods do not readily distinguish benign versus malignant disease. Serum PSA levels normally range from 4–10 ng/ml in healthy men, although about 30% of men within this range are thought to have early-stage prostate cancer. Furthermore, multiple molecular forms of PSA exist. It can be found free in the serum or in complexed forms, which occur more frequently in men who have prostate cancer. The new methodology developed by Roswell Park researchers aims at recovering all forms of PSA with the goals of clarifying whether certain forms are more prevalent in prostate cancer and whether these forms may be used in disease staging. The method involves thiophilic chromatography where the PSA complexes have a strong affinity for a specific gel matrix. The complexed forms can be removed from the gel and examined by Western blotting using antibodies specific for PSA. Thus far, researchers have been able to identify different molecular forms of PSA in the seminal plasma, patient sera, and in prostate cancer cells in culture.

Protein Identified in Head and Neck Cancers May Prove a Target for Therapies

Researchers at the University of Pittsburgh Cancer Institute have identified a protein, gastrin-releasing peptide receptor (GRPR), in squamous cell carcinoma of the head and neck (SCCHN) that was found previously in lung cancer cells of patients with extensive smoking histories. The results appear in the March 6 issue of the Journal of the National Cancer Institute (Vol. 94, pp. 375–383). Previous research showed that cells are triggered to grow when stimulated by gastrin-releasing peptide. By comparing cells from 25 patients with SCCHN and 6 people without SCCHN, the researchers show that an increased expression of GRPR occurs early in the formation of SCCHN tumors. A fivefold increase in GRPR occurred in tissues of people with SCCHN compared to those without. This work suggests that GRPR may be linked to the growth and proliferation of SCCHN. It also suggests that receptor-directed therapies may be useful strategies for patients with SCCHN.

CLINICAL RESEARCH

Increased Hemoglobin Levels Correlate With Improved Fatigue Scores in Patients With Cancer

A study presented in October 2001 at the European Cancer Conference in Lisbon, Portugal, indicated that Aranesp® (darbepoetin alfa, Amgen Inc., Thousand Oaks, CA) can reduce fatigue for patients with cancer who have anemia. Researchers from the University of California at Los Angeles presented the study results. Anemia in patients with cancer may be caused by the cancer itself or induced by chemotherapy or radiation. Anemia can lead to severe mental and physical fatigue. Aranesp is a recombinant erythropoietic protein with a serum half-life three times longer than epoetin $\alpha$. The data from two international multicenter trials involving 517 patients were presented. Patients received Aranesp, epoetin $\alpha$, or a placebo over 12 weeks. Researchers measured hemoglobin levels and used a standardized questionnaire to assess fatigue, anemia symptoms, and functional, physical, emotional, and social/family well-being. Increased hemoglobin levels correlated with improved fatigue scores, albeit with a small correlation coefficient ($r = 0.19, p = 0.002$). The effect was more pronounced in women than in men. When hemoglobin values increased by more than 2 G/dl, fatigue scores improved by 53% in women and only 15% in men.

Colony Stimulating Factor May Reduce Side Effects for Patients Identified at High Risk

Colony stimulating factor (CSF) (e.g., Neupogen® [filgrastim, Amgen Inc., Thousand Oaks, CA]) is recommended when a high risk of febrile neutropenia exists. Researchers from the University of Texas M.D. Anderson Cancer Center in Houston reported their findings at the 24th Annual Breast Cancer Symposium (San Antonio, TX, December 10–13, 2001) comparing outcomes for patients who received CSF and those who did not. The study (multicenter, prospective) involved 624 patients with stage I–III breast cancer treated with one of the commonly used chemotherapy regimens. The nadir absolute neutrophil count (ANC) was determined between days 8 and 15 of the first cycle and used to assign patients to the CSF treatment group. If the ANC was less than or equal to 500/microliter (Silber model), patients received CSF (high risk group, $n = 360$); otherwise, patients received CSF only if febrile neutropenia occurred or if a therapy delay occurred because of neutropenia ($n = 264$). Matched-pair analysis with an historical control group ($n = 1,022$) was used to evaluate outcomes. The study demonstrated that for the treatment group, fewer patients received reduced regimen of chemotherapy because of neutropenia and fewer patients...