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Meeting report

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Innovative biological therapies

Leading oncologists presented new research on a novel use of monoclonal antibody (mAb) treatment for colorectal carcinoma (CRC), an allogeneic melanoma vaccine and the addition of a vitamin A analog to interferon therapy for advanced kidney cancer. Post-operative infusion of a mAb treatment reduced both the death rate and recurrence rate for patients with resected CRC, according to a randomized study presented by lead investigator Gert Riethmuller of the University of Munich. Unlike previous studies which investigated the use of mAbs as a therapeutic treatment for large solid tumors, this study investigates mAbs to target early metastatic cancer cells that remain after a tumor has been removed.

In the 5-year study, 189 patients with CRC, classified as Dukes C, were randomly assigned to either an observation regimen or to post-operative infusion with 500 mg of mAb 17-1A followed by four monthly doses of 100 mg of mAb 17-1A. The study of 166 eligible patients demonstrated a 30% reduction in death rate ($p = 0.04$) and a 27% reduction in recurrence rate ($p = 0.03$). At 5-year follow-up, 55 of 90 treated patients were alive as compared with only 37 of 76 patients in the observation group. mAb treatment did not have an effect on the incidence of local relapse ($p = 0.074$), while distant metastases were significantly reduced ($p = 0.0014$).

"Monoclonal antibodies have been largely ineffective against large tumors, but this study suggests that mAbs can reach and kill individual residual cancer cells dispersed in tissue", said Lynn Schuchter of the University of Pennsylvania. "This novel use of mAb 17-1A for the treatment of colorectal cancer may have future applications for other types of cancers that may respond to specific antibodies".

Phase III study of melanoma vaccine may have significant clinical impact

Initial results of the first double-blind, randomized phase III trial of an allogeneic melanoma vaccine was announced by lead investigator Marc K Wallack, of St Vincent's Hospital and Medical Center, New York.

The study, conducted at 11 institutions, measured both the disease-free interval (DFI) after primary treatment and the absolute survival of 250 patients with pathologic stage II melanoma (one to five positive lymph nodes). The patients, who were at a high risk for recurrence, were randomized to receive vaccinia melanoma oncolysate (VMO) or the placebo of vaccinia vaccine virus (V). The primary objective of this study was to detect a difference in DFI in the VMO group compared with V alone.

"This study, if successful, may eventually lead to the use of a vaccine for the treatment of patients with high-risk melanoma", said Lynn Schuchter of the University of Pennsylvania Hospital. "Such a vaccine could have a significant impact on clinical practices".

The allogeneic vaccine, derived from four different melanoma cell lines, is designed to stimulate the patient's immune response against a wide range of melanoma cells. It differs from recently studied analogous melanoma vaccines in which melanoma cells taken from a patient are reinfused into the same patient after they have been altered through one of several immunity-boosting strategies. An allogeneic vaccine would have the theoretical advantage of being more widely applicable, including those patients who do not have sufficient tumor to use for their own vaccine.

Vitamin A analog increases antitumor activity of interferon-α2A (IFN-α)

The results of a recent study suggest that vitamin A analog may increase the antitumor effect of IFN-α in patients with advanced kidney cancer, according to phase II trial results presented by lead author Robert J Motzer of Memorial Sloan-Kettering Cancer Center.

In this single-center trial, 24 patients with advanced renal cell carcinoma (RCC) were treated on an outpatient basis with IFN-α in escalating doses and 13 cis-retinoic acid (C-RA). A major response was achieved in 29% of patients, including one complete remission and six partial remissions. Responding sites included primary renal and bone metastases, which are unusual sites of response in patients with kidney cancer. In six of the seven patients with a major response, the response was continuous for 3 to more than 9 months.

A previous study conducted at the same institution showed that only 10% of patients with advanced RCC achieved major responses when treated with IFN-α alone or in combination with vinblastine (*J Clin Oncol* **11**: 1375 and **10**: 1124). A randomized trial is underway to further evaluate the efficacy of IFN-α with C-RA compared with IFN-α alone.

"The addition of a vitamin A analog to interferon appears to offer low toxicity and significant clinical benefit to patients with advanced kidney cancer, a disease for which there are few effective treatments", says Lynn Schuchter. "Further studies are needed to assess the benefits of this combination therapy".

Seven patients had minor response or stable disease and the disease had progressed in 10 patients. The major toxicity was myelosuppression. Overall, the treatment was well tolerated.

Sequential interleukin-3 (IL-3) and granulocyte-macrophage colony stimulating factor (GM-CSF) successful in treating advanced breast cancer patients

Using IL-3 followed by GM-CSF helped both platelet and neutrophil recovery after chemotherapy in patients with advanced breast cancer, according to a five-part study of 91 patients who received five, 21 day cycles of chemotherapy treatment for advanced breast cancer. Patients re-

ceived one of the following combinations of IL-3 and/or GM-CSF: IL-3 alone, sequential IL-3 followed by GM-CSF with varying durations of IL-3, IL-3 and GM-CSF or GM-CSF alone.

"Women who receive chemotherapy for breast cancer often suffer from low neutrophil and platelet counts that can put them at risk for infection and bleeding", said Lawrence Piro of Scripps Clinic & Research Foundation, at a media briefing on growth factor research. "This study demonstrates that using sequential IL-3 followed by GM-CSF lessens this risk by increasing the number of platelets and neutrophils after chemotherapy".

The study, led by Joyce O"Shaughnessy of the National Cancer Institute, found that sequential IL-3/GM-CSF is associated with significantly higher platelet counts ($p = 0.04$), shorter durations of platelet counts less than 50 000 ($p = 0.017$), and less platelet toxicity compared with concurrent IL-3 and GM-CSF or GM-CSF alone. Eighty-two percent of cycles showed neutrophil and platelet recovery by day 22 with sequential IL-3/GM-CSF, compared with 59% recovery for IL-3 alone and 69% for GM-CSF alone. Delivered dose intensity was highest with sequential IL-3 and GM-CSF.

Phase I study finds IL-11 prevents thrombocytopenia in breast cancer patients

Results from a new phase I study show that women with advanced breast cancer who receive treatment with recombinant human IL-11 (rhIL-11; IL-11) following cyclophosphamide and doxorubicin chemotherapy demonstrated reduced thrombocytopenia (low platelet counts). IL-11 was found to be well tolerated at doses of 50 μg/kg/day or less. Side effects consisted primarily of constitutional symptoms, including myalgias, arthralgias and fatigue. Michael S Gordon of Indiana University Medical Center presented these findings.

"This study identifies IL-11 as an agent which has the potential for reducing hematologic toxicity associated with chemotherapy", said Dr. Piro. "We can use this study to identify potentially useful doses of this drug which can be applied to other models where thrombocytopenia is an even greater problem".

Sixteen women received subcutaneously admin-istered rhIL-11 at doses of 10, 25, 50, 75 and 100 μg/kg/day. rhIL-11 was administered for 14 days during a 28-day pre-chemotherapy period and for 12 days following each of four planned cycles of chemotherapy. In cycle 0, treatment with rhIL-11 resulted in a dose-related increase in peripheral blood platelet counts of up to 185% of baseline. Following chemotherapy, the administration of rhIL-11 at doses of 25 μg/kg/day or higher resulted in attenuated thrombocytopenia. This effect on platelets was seen not only following the first cycle of chemotherapy, but also with repetitive cycles of therapy suggesting that in this model, rhIL-11 can reduce the development of cumulative thrombocytopenia.

G-CSF reduces neutrophil recovery time following chemotherapy for acute lymphoblastic leukemia (ALL)

G-CSF when used as part of an intensive chemotherapy program for treatment of adults with ALL reduced the time for neutrophil recovery after chemotherapy, according to a double-blind placebo controlled study. The study was presented by lead author Richard Larson of the University of Chicago Hospital.

Investigators in the Cancer and Leukemia Group B randomly assigned 184 newly diagnosed patients to start subcutaneous treatment with G-CSF or with a blinded placebo. G-CSF was continued until the neutrophil count was greater than 1000. Once patients were determined to be in remission, they began consolidation treatment consisting of two additional months of chemotherapy. Once the drug was unblinded, those patients on G-CSF continued receiving G-CSF for the consolidation phase and those on the placebo received nothing.

Results show that G-CSF significantly reduced the time for patients both under and over age 60 to recover more than 1000 neutrophils and more than 50 000 platelets. During induction, there were fewer severe infections in the G-CSF group. The complete remission rate in the G-CSF group was 91% compared with 80% for the placebo group.

"By using G-CSF, we think we can diminish the toxicity and perhaps improve the response rate in older patients with acute lymphoblastic leukemia", said Dr Piro. "Results from this study indicate that we may be able to give more intensive chemotherapy to older adults with ALL, a group which has not had a very high response rate in the past".

Increasing age was associated with a lower remission rate, slower neutrophil and platelet recovery and longer hospitalization during induction. However, 85% of the patients over age 60 who received G-CSF achieved complete remission compared with 59% of those who received the placebo. Further studies are needed to examine the full benefits of using G-CSF on ALL patients over age 60.

ALL is a disease in which too many lymphocytes, infection-fighting white blood cells, are found in a patient's blood and bone marrow. Lymphocytes are made by the bone marrow and by other organs in the lymph system.

Post-induction therapy with GM-CSF does not lessen myelosuppresion in older acute myeloid leukemia (AML) patients

Using GM-CSF to lessen myelosuppression following induction chemotherapy in patients with AML 60 years of age or older does not show a benefit, according to a randomized, double-bline study conducted by the Cancer and Leukemia Group B and led by Richard M Stone of Dana-Farber Cancer Institute. Results from this study were presented at a media briefing at the ASCO annual meeting.

Investigators assigned 388 AML patients 60 years of age or older who had no prior history of bone marrow problems to receive 3 days of daunorubicin and 7 days of ara-C. On the eighth day, patients were randomized

to receive either a placebo or GM-CSF.

Results from 379 evaluated patients show little difference between the two arms: of the 186 randomized to G-CSF, 52% reached complete remission and of the 193 randomized to the placebo group, 54% achieved complete remission. The number of days the two groups had low neutrophil counts was 17 days in the GM-CSF arm and 15 days in the placebo arm. Rate of severe infection was also similar in both groups.

These results indicate that GM-CSF does not improve the complete remission rate nor have a major effect on the myelosuppression associated with induction chemotherapy in AML patients over 59 years old. However, GM-CSF did not appear to stimulate the growth of leukemic cells, an effect believed to have been possible based on previous laboratory studies with this agent.

"The similarity in the findings from both groups indicate that it is often very hard to tell what causes side effects in patients whose blood counts are very low", said Dr Piro. "This study emphasizes the importance of conducting clinical trials to ensure that a drug that has had encouraging results in small, single-agent studies is actually beneficial in large, placebo-controlled, randomized studies".

AML is a disease in which cancer cells are found in a patient's blood and bone marrow. The bone marrow makes red blood cells (which carry oxygen and other materials to all tissues of the body), white blood cells (which fight infection) and platelets (which make blood clot).

Circadian rhythm aids chemotherapy

A randomized, multicenter phase III trial found that circadian rhythmic delivery (CRD) of a 3-day chemotherapy regimen for previously untreated patients with metastatic colorectal cancer resulted in a 49.5% overall response rate compared with 30% for constant infusion delivery of the same chemotherapy regimen ($p = 0.007$). Lead author Francis Levi of Laboratoire Rythmes Biologiques, France, presented the clinical data at the ASCO annual meeting.

"The response rate in this study was among the highest ever achieved in a multicenter clinical trial of chemotherapy for metastatic colorectal cancer patients", said Margaret Kemeny of North Shore University Hospital. "The reduced toxicity associated with circadian rhythmic delivery may enable researchers to investigate using higher doses of chemotherapy, which may result in greater clinical response rates".

Of 186 patients enrolled in the study, 93 were randomized to receive oxaliplatin, 5-fluorouracil and folinic acid as a 5-day constant infusion. The remaining 93 patients received the same agents via a multichannel pump programmed to deliver a CRD rate of specific agents at specific times of the day to correspond with biologic rhythms. Human biological functions, such as cellular proliferation, vary predictably from a maximum to a minimum along the time scale. These circadian (about once daily) rhythms are endogenous and have a genetic basis. They are coordinated by a biological clock located in the brain.

In addition to producing better overall response, CRD produced less toxicity than the constant infusion schedule. Mouth ulcers, an immediate side effect of chemotherapy which prevented patients from eating or drinking for several days, occurred in 14% of the patients on CRD and in 76% of the patients on constant infusion. Peripheral sensory neuropathy, or the cumulative dose-limiting toxicity, occurred in 15% of patients receiving CRD compared with 29% of patients receiving constant infusion.

Biodegradable polymers prove effective for treating brain tumors

Surgically implanted biodegradable polymer disks may be used to safely and effectively deliver chemotherapy agents directly to malignant brain tumors, according to a randomized, multicenter, placebo-controlled phase III trial. The results were presented by lead author Henry Brem of Johns Hopkins University School of Medicine.

The study, conducted by 27 medical centers in the US and Canada, involved 222 patients with recurrent malignant brain tumors requiring reoperation. Patients were randomly assigned to receive surgically implanted biodegradable polymer discs with or without 3.85% carmustine (BCNU), a chemotherapeutic agent. The median survival rate of the 110 patients who received BCNU polymers at reoperation was 31 weeks, compared with 23 weeks for the 112 patients who underwent reoperation but received placebo polymers ($p = 0.005$).

When a polymer impregnated with BCNU biodegrades, it releases a high concentration of treatment over a sustained period of time, while minimizing exposure of BCNU to the rest of the body. The study found no clinically significant adverse reactions to the BCNU-polymer either in the brain or systemically.

"Biodegradable polymers may eventually enable clinicians to treat brain tumors with a variety of chemotherapy agents that previously could not be used because they were unable to cross the blood–brain barrier", said Richard Schilsky of the University of Chicago. "This novel drug delivery technique may have future applications for the treatment of other localized cancers".

Gene therapy study targets *myc* and p53 in endometrial cancer cell lines

Fragmented genes known as oligos successfully blocked cancer genes in cultured endometrial cancer cells, according to results of a gene therapy study presented by lead author Mike Janicek of the University of Miami School of Medicine.

The study examined the use of oligos against the gene *myc* and the gene that encodes for protein 53 (p53) and showed inhibition of growth in two endometrial cancer cell lines, KLE and RL95-2. The oligos bind to DNA of the cancer cells very specifically, causing inhibition of the p53 and *myc* gene transcription. This interrupts the life cycle of the cell and prohibits it from dividing again.

"Right now, there is little effective therapy for advanced endometrial cancer", said Richard Schilsky of the University of Chicago. "We are just beginning to find specific genetic mutations that are involved in the

growth of cancer cells and we are targeting therapies against these specific mutations".

Recent clinical data on autologous bone marrow transplants (ABMT) for breast cancer and leukemia

Results from several studies investigating the use of ABMT to treat breast cancer and leukemia were presented at the ASCO meeting. In an autologous transplant, or autotransplant, the patient's own marrow is removed, purified and returned to the patient.

Results of a retrospective analysis of clinical data collected by the North American Autologous Bone Marrow Transplant Registry (NAABMTR) indicate a marked increase in the number of autotransplants performed for breast cancer in the US and Canada from 1989 to 1992. Clinical data collected from more than 80 centers in North America found that 893 women received autotransplants for breast cancer, compared with 258 in 1989.

Results also showed an increased use of autotransplant as an adjuvant/neoadjuvant therapy and as a treatment for chemotherapy-sensitive metastatic disease. The 2-year probability of survival (95% confidence interval) for autotransplants as an adjuvant/neoadjuvant therapy is 77 ± 8% and for metastatic disease 35 ± 4%. The data were presented by lead author Karen Antman of Columbia-Presbyterian Medical Center.

"Because this study documents the increased use of autotransplant for breast cancer, it has important implications for future health care policies", said Rein Saral of Emory University at a media briefing today. "This study also illustrates a shift in how autotransplants are being used in the clinical setting".

Results from an additional study conducted by the NAABMTR indicate that since 1989, over 900 patients in the US and Canada have received autotransplants for AML. Most patients receive the transplant in their first remission and most receive marrow that has been treated *in vitro* to remove leukemia cells. Data were presented by investigator Mary Horowitz, of the Medical College of Wisconsin.

The study found that early mortality (mortality at 100 days) after ABMT for these patients is about 20%. Two-year survival for patients receiving their transplant in first remission is 55%, 36% for those who receive transplants in second remission, and 25% for those with more advanced disease.

"ABMT for leukemia seems to be a technology that is growing more rapidly than previously realized", said Howard Weinstein of Dana-Farber Cancer Institute. "The number of patients receiving autotransplants is close to the number of those receiving allogeneic transplants in North America".

For AML patients who have a sibling who is an identical HLA (Human Leukocyte Antigens) match, allogeneic transplants are more commonly used than autotransplants. In an allogeneic transplant, another person donates the marrow to be used. Only about 30% of AML patients have an HLA-identical sibling. Autotransplants have been proposed as a potential solution to this problem since the patient acts as his or her own donor.

Study examines chemotherapy alone and auto- and allotransplants for the treatment of AML

A randomized study of 1,572 patients, including 295 children, found that auto- and allotransplants produced similarly effective results when combined with intensive chemotherapy for the treatment of AML. Investigators achieved an 81% overall complete remission and a 40% overall survival rate. Results were presented by one of the lead investigators AH Goldstone of University College Hospital in London.

Investigators randomized the patients to receive either of two chemotherapy regimens: daunorubicin, ara-C and thioguanine (DAT) or ara-C, daunorubicin and etoposide (ADE) for the first two courses followed by *m*-AMSA, ara-C and etoposide (MACE) and mitozantrone and ara-C (MidAC) as the third and fourth course. Patients who had an HLA-compatible sibling received an allotransplant. Those who lacked HLA-compatible donors had unpurged marrow stored and were randomized to receive an autotransplant or to stop treatment. Of the total patients, 259 had a matched donor and 176 underwent allotransplant. Overall death rates post-transplant were 22% for allotransplant and 13% for autotransplant.

"The evidence from this study suggests that prognostic factors, in particular chromosome abnormality in leukemic cells, profoundly effect the outcome of a patient regardless of the treatment arm to which they were randomized", noted Dr Weinstein. "Many patients are concerned about not having an HLA-compatible sibling donor. This study shows that there is no overall difference in outcome whether or not an individual has a donor".

New drug regimens for lung and breast cancer presented

A phase I/II study investigating the administration of bi-weekly paclitaxel and cisplatin to treat metastatic breast cancer reported a 94% total response rate. Data was presented by lead author, Karen Gelmon of the British Columbia Cancer Agency.

In the initial evaluation of the study, 20 patients received paclitaxel 90 mg/m^2 over 3 h and cisplatin 60 mg/m^2 every 2 weeks. Of these 20 patients, 16 were evaluable for response: 25% had a complete response and 69% demonstrated a partial response for a total response rate of 94%. Unfortunately, investigators were unable to escalate the doses during the phase II portion of the trial because of hematologic toxicity.

"Although cisplatin is not commonly used as a first-line treatment in breast cancer, it does appear to have activity when combined with paclitaxel", said Margaret Kemeny of North Shore University Hospital. "The high level of complete responses in this study suggests that this combination may be in-corporated into adjuvant and metastatic treatments".

Toxicities in this study were mainly hematologic, not severe and not associated with clinical symptoms. The results report that 61% of the patients demonstrated mild anemia with only one out of 11 patients suffering grade 3 toxicity. White cells decreased in 94% of the patients and absolute endometrial count (ANC) decreased in

100% of the patients, although the median duration of ANC below 500 was only 2 days and not associated with sepsis. The hematological toxicity was tolerable. The majority of patients complained of grade I or II fatigue and nausea.

Comparative study finds combined modality therapy (CMT) is cost-effective for non-small cell lung cancer (NSCLC)

CMT for the treatment of stage III NSCLC is cost-effective to either standard radiation treatment or no treatment, according to a Canadian model that estimates the impact of health care costs on current practices. The model incorporates information on diagnosis, staging, treatment and survival by stage and cell type, based on Canadian practice patterns.

The study, presented by William Evans of the Ottawa Regional Cancer Center, evaluated the impact of CMT on 1826 cases of stage IIIa and 1605 cases of stage IIIb NSCLC, which were diagnosed in Canada in 1988. Investigators compared the hospital and outpatient costs of two preoperative and two postoperative cycles of MVP plus surgery for stage IIIa and two cycles of vinblastine and cisplatin and radiotherapy for stage IIIb with the costs for standard out-patient radiotherapy and no treatment.

The study revealed that incremental costs to the Canadian health care system for the 1826 cases of stage IIIa NSCLC and 1605 cases of stage IIIb NSCLC would be a total of $14 million for stage IIIa and $6.6 million for stage IIIb. The estimates of total life years gained are 2116 for stage IIIa and 2274 years for stage IIIb. This equates to an average cost-per-life year gained of $6638 and $2898 for stages IIIa and IIIb NSCLC, respectively. CMT is a cost-effective alternative to either standard treatment or no treatment of stage III NSCLC within the Canadian health care system. Further studies are needed to assess future applications of this model in the US.

"This study demonstrates how oncologists are taking patient care and cost efficacy into account", noted Margaret Kemeny of North Shore University Hospital. "Even though newer therapies may increase the cost per patient, ultimately, the therapy may be cost-effective".

Perioperative chemotherapy and surgery increases survival for resectable stage III NSCLC

According to a prospective, randomized study, patients who received perioperative chemo-therapy (chemotherapy before and after surgery) for the treatment of resectable stage III NSCLC had an estimated median survival of 64 months compared with 11 months for patients having surgery alone. This represents a 6-fold difference in the median survival between the two groups of patients.

Lead investigator Jack A Roth of MD Anderson Cancer Center presented results that indicate perioperative chemotherapy is more effective than surgery alone for the treatment of resectable stage III NSCLC. The estimated 2- and 3-year survival rates for perioperative chemotherapy patients are 60 and 56%, respectively, and 25 and 15% for those patients who undergo only surgery.

Investigators randomly assigned 60 patients to receive either three cycles of chemotherapy (cyclophosphamide, etoposide and cisplatin) and surgery or surgery alone. Patients underwent surgical resection after three cycles of chemotherapy. Patients who achieved tumor regression with chemotherapy before surgery received three additional chemotherapy cycles after surgery. After three cycles of chemotherapy, the response rate was 35%.

"The survival rates for lung cancer patients are very poor, and perioperative chemotherapy could benefit as many as 5000 patients per year in the United States", noted Derek Raghavan, of Roswell Park Cancer Institute. "This study could have great impact in terms of the kind of treatment oncologists adopt for this specific stage of disease".

New diagnostic tools and prognostic factors

Initial research reveals positron emission tomography (PET) has a potentially vital role in planning the treatment of patients with melanoma and genitourinary cancers. Gene therapy for the evaluation of tumors in head and neck cancers and lymphoma also holds promise for future clinical applications.

A new study indicates that whole body PET scans may be the most effective and accurate staging tool now available for patients with metastatic malignant melanoma. In a study of 24 patients with metastatic melanoma who underwent radiographic study, a whole body PET scan identified a greater extent of the melanoma than more conventional methods, usually a combination of X-ray, magnetic resonance imaging (MRI) and computed tomography (CT scan).

The study, presented by investigator Donald L Morton of the John Wayne Cancer Institute, assessed whole body PET in the management of patients with metastatic melanoma. PET scans identified a greater extent of disease than conventional radiographic methods in 16 out of 24 patients (67%). In six other patients, PET scans identified the same extent of disease (25%). PET scans matched biopsy findings in 95% of the patients and in 96% of the specimens. Whole body PET scanning significantly altered surgical and nonsurgical treatment decisions in almost half of the 33 total melanoma patients. In many cases surgery was canceled or modified, and adjuvant therapies such as chemotherapy or melanoma vaccine therapy were changed.

"This study demonstrates that PET scan is valuable as the initial staging procedure in evaluating metastatic malignant melanoma", said Brian Leyland-Jones of McGill University. "Additionally, PET scan has an advantage over other imaging techniques in that it can view a whole body in one sitting and a patient does not have to move from machine to machine".

PET uses a radioactive tracer to identify tumors hidden in the body. This tracer is attached to glucose, the simplest body sugar and injected intravenously. Since cancer cells metabolize glucose faster than normal cells, the PET scan detects these cells by showing areas of increased metabolism.

PET evaluation may eliminate post-chemotherapy surgery for patients with GCT

Using a PET scan to evaluate patients with post-chemotherapy germ cell

(reproductive cell) tumors (GCT) may be useful for the detection of residual cancer following chemotherapy and may assist in determining which patients should undergo post-chemotherapy surgery.

Investigators performed surgery in 15 patients, nine following first-line chemotherapy and six following salvage chemotherapy. PET scan standardized uptake values (SUV) were highest in the patients that demonstrated residual carcinoma ($p = 0.0058$). Results were presented by lead author, Anthony Stephens of Indiana University School of Medicine.

"A PET scan is an important adjunct to the treatment regimen for germ cell tumors", said Dr Leyland-Jones. "Previously, doctors performed post-chemotherapy surgery and often they discovered only scar tissue. The PET scan may assist in identifying instances where surgery may not be necessary".

p53 expression may be important prognostic factor in head and neck squamous cell carcinoma (HNSCC)

Results from a retrospective study found that p53 was a significant predictor of increased incidence of second cancers and decreased survival rate in patients with HNSCC. Findings from this study were presented by lead investigator Dong Shin of MD Anderson Cancer Center.

Of the 118 patients originally included in this study, 10 were found to have a recurrent tumor sample, rather than a primary tumor. Of the 108 tumor samples, 49% had positive p53 status. The study reported median survivals were 50 months for patients in the p53 (+) group and 108 months for the p53 (−) group ($p < 0.01$). Additionally, p53-expressed status produced a higher incidence ($p = 0.001$) of secondary primary tumors (39%) than the p53-negative group (11%).

"This study shows just how much p53 expression might affect the treatment of human cancers", said Dr Leyland-Jones. "The results from this study suggest that p53 expression may be an important prognostic factor in patients with head and neck squamous cell carcinoma".

Investigators also analyzed 99 patients to determine a correlation between smoking status and p53 expression. The expression of p53 was higher in heavy smokers (55%) and oral tobacco or pipe smokers (63%). Conversely, p53 expression was lowest in non-smokers and light smokers (31%).

Gene marker may predict lymphoma patients at risk for relapse

Results from a study of 76 patients diagnosed with diffuse large cell lymphoma (DLCL) indicate that patients whose tumors express the bcl-2 gene *translocation were more likely to have late recurrences and clinical characteristics similar to patients with low grade or slow growing lymphomas. Lead investigator, Thomas Miller of the Arizona Cancer Center, presented these findings.*

Patients with DLCL, an aggressive and fast-growing malignant tumor of the lymphoid tissues, rarely relapse after a disease-free interval of 5 years. Translocation of the *bcl-2* gene has been identified in patients with low grade or slow growing lymphomas. When the translocation of the *bcl-2* gene is present, it prevents the normal process of cell death resulting in immortal cells.

"In looking for the presence of the *bcl-2* gene, this study has identified a group of people that appear to be somewhat different", said Dr Leyland-Jones. "There is a group of patients within the aggressive disease category that seem to have a lower-grade, slower-growing type of disease who seem to be at increased risk of late relapse. Further studies are needed before we can individualize treatment for these types of lymphomas".