Department of Internal Medicine
Division of Clinical Oncology/Hematology

Keisuke Aiba, *Professor and Chairperson*
Takaki Shimada, *Associate Professor*
Hidekazu Masuoka, *Assistant Professor*
Shingo Yano, *Assistant Professor*
Yutaka Takei, *Assistant Professor*
Katsuki Sugiyama, *Assistant Professor*
Noriko Usui, *Professor*
Nobuaki Dobashi, *Assistant Professor*
Kaichi Nishiwaki, *Assistant Professor*
Yuhichi Yahagi, *Assistant Professor*
Yoji Ogasawara, *Assistant Professor*
Yuko Shiota, *Assistant Professor*

General Summary

The immediate goals of our clinical and basic research are to investigate basic and clinical aspects of malignant diseases and to try to improve outcomes for patients with solid tumors and hematological malignancies, leading to the ultimate goals of improving the natural history of malignant diseases. We have also been performing several clinical trials and basic research studies throughout 2013.

Research Activities

Leukemias

Many patients with previously untreated hematological disorders have been referred to our department. The disorders in 2013 included acute myeloid leukemia (AML), 23 cases; acute lymphoblastic leukemia (ALL), 6 cases; chronic myeloid leukemia (CML), 1 case; and myelodysplastic syndrome (MDS), 13 cases. We have performed clinical trials as a member of the Japan Adult Leukemia Study Group (JALSG), which is a distinguished leukemia research group established more than 20 years ago in Japan for the clinical research and treatment of AML, ALL, and CML. The JALSG protocol studies performed in 2013 were as follows: AML-209-GS, AML209-KIT, JALSG-ALL-CS-12, JALSG-CS-11, JALSG AML209-FLT3-SCT Study (AML209-FLT3-SCT), a Phase II JALSG APL212 study, APL212G, JALSG MDS212 study, JALSG MDS212 Study (MDS212), JALSG Ph(-)B-ALL213, JALSG Burkitt-ALL213, and JALSG T-ALL213-O. We also participated in several cooperative group studies and pilot studies: Aged Double-7 (newly diagnosed AML in the elderly: phase II), VEGA (MDS: phase II), a study of nilotinib (refractory CML: phase I/II), and a study of dasatinib (refractory CML: phase I/II).

Lymphomas

In 2013 we registered 77 patients with newly diagnosed non-Hodgkin's lymphoma and 7 patients with Hodgkin's lymphoma. We have performed clinical trials as a member of the Lymphoma Study Group of the Japan Clinical Oncology Group (JCOG). The studies JCOG0406 (newly diagnosed mantle cell lymphoma: phase II) and JCOG0601 (newly diagnosed low-risk advanced diffuse large B-cell lymphoma: phase II/III) were pivotal protocol studies beginning in 2010. A randomized phase II study in patients with high-

risk diffuse large B-cell lymphoma has also been started (biweekly rituximab-cyclophosphamide, doxorubicin, vincristine, and prednisone [bi-R-CHOP] ± cyclophosphamide, cytarabine, dexamethasone, etoposide, and rituximab [CHASER] vs melphalan, cyclophosphamide, etoposide, and dexamethasone [LEED]; JCOG0908). Other cooperative studies examined biweekly rituximab, etoposide, prednisone, vincristine, hydroxydaunorubicin (R-EPOCH: relapsed and refractory B-cell lymphoma: phase II) and pirarubicin, cyclophosphamide, vincristine, and prednisolone (THP-COP: newly diagnosed T-cell lymphoma: phase II).

Myeloma

We registered 10 patients with newly diagnosed multiple myeloma in 2013. A novel agent, the proteasome inhibitor bortezomib, became available in 2007, and we have used it with or without dexamethasone to treat patients who have refractory myeloma. A randomized phase II study was started in 2010 (JCOG0904) to evaluate the efficacy of bortezomib + dexamethasone versus thalidomide + dexamethasone in patients with relapsed or refractory chemoresistant multiple myeloma. In-house protocols are also being prepared.

Hematopoietic stem cell transplantation

To investigate and establish safer and more effective hematopoietic stem cell transplantation (HSCT), we have performed serial clinical studies examining umbilical cord blood transplantation with a bone marrow-nonablative procedure, a bone marrow-nonablative procedure using antithymic globulin, and mechanisms of graft-versus-host disease in HSCT.

Solid tumors

Many patients with solid cancers have been referred to our department from related divisions or departments from both inside and outside our hospital. Several of our studies seeking improved therapeutic outcomes are in progress throughout our university hospital with related divisions or departments. The combination of fluorouracil (5-FU), epirubicin, and cyclophosphamide (FEC100) with or without taxotere therapy is an adjuvant therapy for patients with breast cancer treated with curative surgery. FEC100 followed by taxotere is a preoperative combination chemotherapy for patients with locally advanced breast cancer. Adriamycin and taxotere followed by taxotere and trastuzumab is a first-line chemotherapy for patients with advanced, metastatic breast cancer. Since late 2008 we have been investigating a combined-modality therapy of radiation and chemotherapy with docetaxel, cisplatin, and 24 hours' continuous infusion of 5-FU (DCF regimen) for patients with locally advanced esophageal cancer. The study has been completed, and an improved protocol was launched last year. A novel drug-development study with an orally decaying formulation of S-1 has been performed in patients with advanced gastric cancer. A multicenter cooperative randomized phase II study was started in 2011 to compare S-1 + cisplatin, S-1 + leucovorin, and S-1 + leucovorin + oxaliplatin for patients with advanced and recurrent gastric cancer. Because trastuzumab is also active in patients with human epidermal growth factor receptor 2-positive gastric

cancer, we treat such patients with capecitabine + cisplatin (XP) + trastuzumab. Our first-line chemotherapies for patients with advanced colorectal cancer are folinic acid, fluorouracil, and oxaliplatin (FOLFOX) and folinic acid, 5-FU, and irinotecan (FOLFIRI). Since antibodies against vascular endothelial growth factor and against epidermal growth factor receptor became available in 2007 and 2008, respectively, combination therapies of these antibodies and FOLFOX or FOLFILI have also been performed.

Basic research

One of our important activities is translational research on solid cancers and hematological malignancies. The structural differences between M protein produced by myeloma cells and that from monoclonal gammmopathy of undetermined significance have been examined, and the function of ATP-binding cassette transporters in cancer chemotherapy has also been studied in collaboration with Keio University's Department of Pharmacy. Transfer of the *MDR1* gene into hematopoietic stem cells is a method of potentially conferring chemoprotection in cancer chemotherapy. Basic research using CD34-postive cells allows us to try such a strategy. The growth and differentiation of CD34-postive cells into which the *MDR1* gene has been transferred has been investigated *in vitro* in collaboration with Keio University's Department of Pharmacy. The results have recently been published, and further research is in progress.

Publications

Nagasaki E, Yuda M, Tanishima Y, Arakawa Y, Kobayashi K, Sakuyama T, Inoue D, Nishikawa K, Kobayashi M, Omura N, Kobayashi T, Aiba K. Complete response of esophageal small cell carcinoma amrubicin treatment. *J Infect Chemother.* 2013; **19:** 770-5.