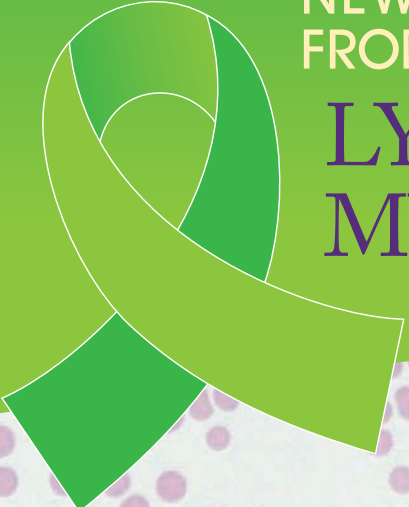


NEWS FROM Roswell Park's  
LYMPHOMA AND  
MYELOMA SERVICE



# MEET THE LYMPHOMA & MYELOMA TEAM

The Lymphoma and Myeloma Service at Roswell Park Cancer Institute (RPCI) is dedicated to providing outstanding clinical care, participating in cutting-edge clinical and laboratory research, and developing more effective treatments for all patients with the following hematologic malignancies:

- Non-Hodgkin lymphoma (NHL)
- Hodgkin lymphoma (HL)
- Chronic lymphocytic leukemia (CLL)
- Multiple myeloma (MM) and other plasma cell disorders (e.g., Waldenström's macroglobulinemia)

The lymphoma and myeloma team at our Institute includes physicians, scientists, hematopathologists, radiologists, radiation oncologists, fellows, nurse practitioners, physician assistants, pharmacists, social workers, clinical nurses, research coordinators and psychologists working as a cohesive group of professionals dedicated to providing compassionate and high-quality care for our patients and to advancing our understanding and treatment of hematologic malignancies.

Our physicians are active members on committees in such national organizations as:

- The National Comprehensive Cancer Network (NCCN): long-term monitoring of lymphoma patients participating in the Lymphoma Outcomes Database; memberships on individual NHL, HL, and Myeloma Therapy Guidelines Committees
- The Alliance for Clinical Trials in Oncology (formerly the Cancer and Leukemia Group B (CALGB) national cooperative group)



**Myron S. Czuczman, MD**  
Chief, Lymphoma and Myeloma Service (Department of Medicine)  
Head, Lymphoma Translational Research Laboratory (Department of Immunology)  
Professor, Medical Oncology and Hematology



**Seema Bhat, MD**  
Assistant Professor, Medical Oncology and Hematology



**Bora Baysal, MD, PhD**  
Associate Professor, Pathology



**Vishala Neppalli, MD**  
Assistant Professor, Pathology



**George Deeb, MD**  
Assistant Professor, Pathology and Laboratory Medicine  
Director, Hematopathology Laboratory  
Associate Director, Flow and Image Cytometry



**Sheila Jani Sait, PhD**  
Assistant Professor, Oncology



**Kelvin Lee, MD**  
Professor, Medical Oncology, Hematology and Tumor Immunology; Jacobs Family Chair in Immunology



**AnneMarie Block, PhD**  
Associate Professor, Oncology  
Director, Cytogenetics



**Francisco J. Hernandez-Ilizaliturri, MD**  
Associate Professor, Medical Oncology and Tumor Immunology



**Petr Starostik, MD**  
Associate Professor, Pathology



**Paul Wallace, PhD**  
Director, Flow & Image Cytometry  
Associate Professor, Pathology



**Mihai Merzianu, MD**  
Assistant Professor, Pathology

# PATHOLOGY A KEY PRIORITY

## Taking diagnosis to a new level

At RPCI, a dedicated team of board-certified hematopathologists performs state-of-the-art integrated diagnostic hematopathology—essential to diagnosing and classifying hematolymphoid neoplasms according to the most recent WHO classification.

“Pathology is not just looking at cells under the microscope anymore,” says **George Deeb, MD**, Assistant Professor, Director of Hematopathology, Department of Pathology & Laboratory Medicine; and Associate Director, Flow and Image Cytometry. “The integrated diagnostic approach is based on comprehensive clinical, morphologic, immunophenotypic, cytogenetic and molecular genetic studies of lymph node, bone marrow, blood and other extranodal and extramedullary tissue samples.”

Our hematopathologists work closely with the Lymphoma clinical team and with other ancillary laboratories at RPCI to expedite prompt, comprehensive assessments. The ancillary laboratories incorporate the following:

- bone marrow laboratory
- immunohistochemistry laboratory with wide arrays of markers available
- flow and image cytometry laboratory with spectrum of comprehensive panels of markers to thoroughly characterize hematolymphoid neoplasms immunophenotypically
- cytogenetic laboratory with karyotypic analysis and large number of FISH probes for many types of genetic abnormalities
- molecular diagnostic laboratory with a plethora of PCR and sequencing-based analyses

“

“This integrated diagnostic approach allows us to characterize the tumor’s fingerprint,” says Dr. Deeb, “and provides the most accurate classification that is critical for planning treatment and predicting therapy response and survival.”

”

## GOING with the FLOW

RPCI’s **Flow and Image Cytometry Facility**—recognized as one of the nation’s first and finest—analyzes cell samples for RPCI clinicians and researchers, leading health centers and many National Institutes of Health clinical studies. This unique facility specializes in leukemias and lymphomas, identifying specific cancer types and subtypes by determining the specific antigen expression of the tumor using analyses with antibodies and sophisticated laser-activated flow cytometry.



# it's personal: targeting treatment to each patient



It's a new era for lymphoma treatment, and it's an exciting time to be a part of it, according to **Myron Czuczman, MD**, Chief, Lymphoma/Myeloma Service and Head, Lymphoma Translational Research Laboratory, Department of Immunology. The advent of targeted therapies such as monoclonal antibodies—for example, rituximab, which targets a surface protein, CD20, on B-cell lymphomas, CLL and related diseases—have revolutionized the manner in which we approach everything from initial diagnosis, pathology, and treatment planning to prognosis assessments. “What has happened,” explains Dr. Czuczman, “is that we can now examine the cancer cell, not only at its surface, but also at the molecular level, thanks to specialized PCR cytogenetics and flow cytometric techniques. We can identify unique molecular characteristics (e.g., expression of certain surface proteins, specific pathways that may be upregulated, chromosomal rearrangements or other distinguishing molecular features). We are now developing agents that target or attack these particular features of the cancer cell, thereby directing therapy largely to the tumor cell and limiting effects on healthy tissue.”



In the past, even with a diagnosis of a specific lymphoma type, a patient would receive the same therapy given for all subtypes. “We don’t do that anymore,” says Dr. Czuczman. “Now we look at not only the diagnosis, but also the

molecular profile of the cancer, which may be very different in two patients with the exact same diagnosis.” The team then determines whether the patient’s cancer has a profile that can be targeted with a drug that works against certain very critical proteins, pathways or molecules in that specific lymphoma. These targeted approaches are more effective against the cancer, and they are less toxic, with fewer side effects than standard systemic chemotherapy regimens.

For certain patients, adding rituximab to, or substituting it for, some of the more toxic therapies has made a huge impact. RPCI is involved in developing the next generation of these antibodies, like an anti-CD19 and/or an anti-CD22. A new anti-CD30 has just been approved. In addition to binding to the intended targets, these new agents are also internalized by the cancer cells, making them optimal delivery systems for additional cancer-killing agents such as chemotherapy, toxins, or radioactive isotopes.

Personalized  
medicine  
becoming  
the standard



# THE Blood AND Marrow Transplant PROGRAM

BMT  
A CENTER OF  
EXCELLENCE

The Blood and Marrow Transplant (BMT) Program at RPCI performs approximately 100 to 120 blood and marrow transplants each year, treating patients with hematologic disorders including acute and chronic leukemias, aplastic anemia, Hodgkin and non-Hodgkin lymphoma, multiple myeloma, myelodysplastic syndrome and selected solid tumors.

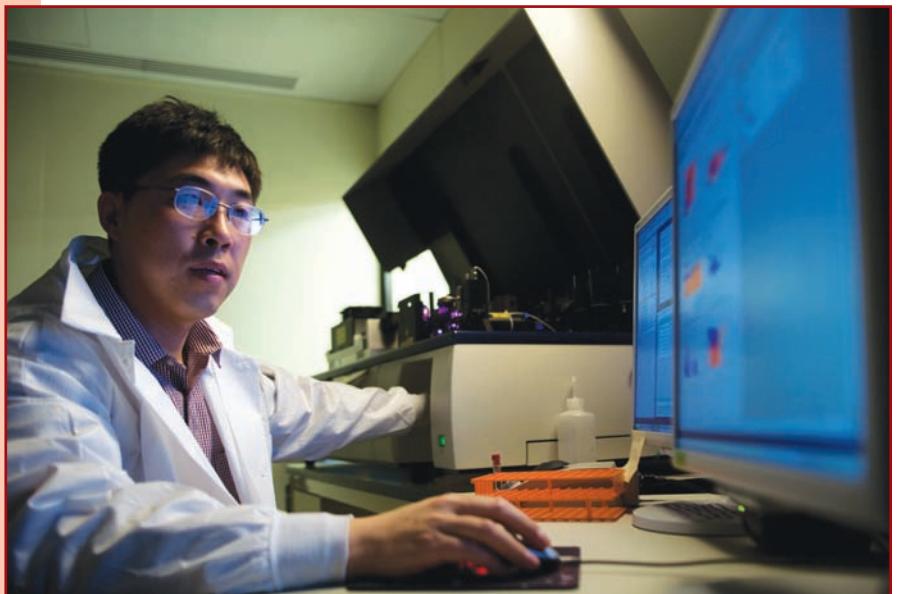
RPCI's BMT unit was designed for patient safety and comfort. The unit, and its 14 private patient rooms, are HEPA-filtered to maintain the highest protection against airborne pathogens. The nursing staff is specially trained in the management and care of immunocompromised BMT patients and their special needs.

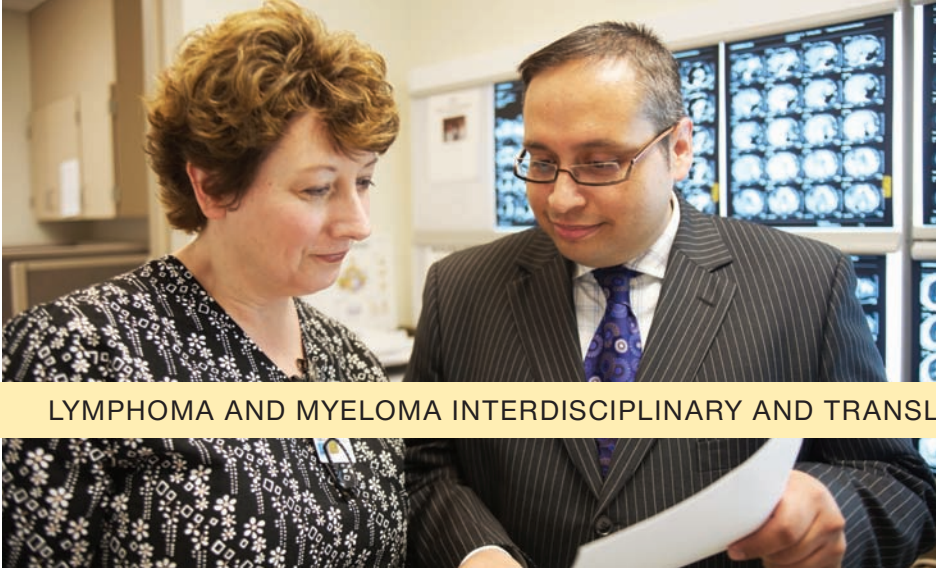
## PROGNOSIS IS PART OF TREATMENT PLANNING

At RPCI, the Lymphoma and Myeloma team looks at the whole picture when assessing a patient's prognosis, including pathology, radiology, staging, symptoms and laboratory values, to predict whether a patient will do well with standard therapy or need more aggressive treatment—from the start. "The best chance of curing a patient is choosing the best and optimal therapy as the first treatment, rather than trying to salvage with second or subsequent therapies later on," says Dr. Czuczman.

## THE RPCI EDGE

The challenge is to choose the appropriate combination of therapies for the specific patient—a choice based on sound, logical evidence. As a comprehensive cancer center that's intimately involved in the research and development of these new therapies—and determining how best to optimize their benefits—RPCI is uniquely equipped to meet that challenge for each patient. The aim of understanding each patient's disease is a concerted effort involving surgeons (who do the biopsies) and experienced hematopathologists, as well as work with colleagues from Cytogenetics, the Laboratory of Molecular Diagnostics, and the Department of Flow Cytometry, with invaluable input from the Diagnostic Radiology and Nuclear Medicine departments.





# the way forward

## LYMPHOMA AND MYELOMA INTERDISCIPLINARY AND TRANSLATIONAL RESEARCH PROGRAM

Our group of clinicians and scientists focuses on studying the biology of B-cell and T-cell malignancies in an attempt to develop novel therapeutic strategies and/or biomarkers that can be used as surrogate markers of response. Using laboratory models, we aim to understand how the patient's immune system and biologically designed therapies—monoclonal antibodies, immunomodulatory drugs or small molecules—interact with lymphoma cells. The ultimate intent is to design and carry out clinical trials for patients with lymphoma and multiple myeloma. "Several clinical studies at our institute are evaluating and testing novel therapeutic strategies in patients with B-cell or T-cell lymphoma," says **Francisco Hernandez-Ilizaliturri, MD**, Associate Professor of Oncology in the Lymphoma/Myeloma Service and the Department of Immunology.

The Lymphoma Translational Research Laboratory focuses on three major areas:

- Understanding the molecular basis for developing resistance to rituximab in patients with B-cell lymphoma
- Developing strategies to enhance the anti-tumor activity of rituximab and other monoclonal antibodies against lymphoma, using targeted specific molecules
- Identifying of biomarkers of response to current available therapies in patients with B-cell lymphoma

As treatment options for patients with lymphomas and related neoplasms become more diverse and complex, it is imperative to identify and validate biomarkers that can be utilized to predict response to a given specific therapy. Tailoring the selection of a specific treatment based on biomarkers has the potential to increase the percentage of patients who will respond to that treatment and who are most likely to gain clinical benefit. To date, we have investigated the following predictive markers:

- Using Han's algorithm to identify patients with relapsed/refractory DLBCL most likely to benefit from lenalidomide therapy
- MUM-1 expression in patients with newly diagnosed DLBCL treated with chemo-immunotherapy at our Institute
- The prognostic predictive value of functional imaging at the time of initial diagnosis in the outcome of patients with follicular lymphoma
- CD5 expression as a biomarker of clinical outcome in patients with newly diagnosed mantle cell lymphoma (MCL) treated at RPCI
- IRF-8 expression in DLBCL

In collaboration with the members of the Lymphoma Section and the Departments of Medicine and Immunology we have been able to establish a prestigious and scientifically respected Lymphoma Translational Research Program that is actively contributing to the field of novel "targeted" therapies of hematologic malignancies and is capable of advancing "bench" findings into rationally designed clinical trials for patients suffering from lymphoma and related neoplasms.



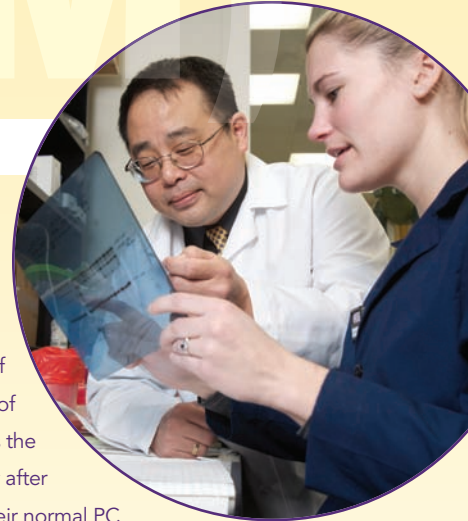
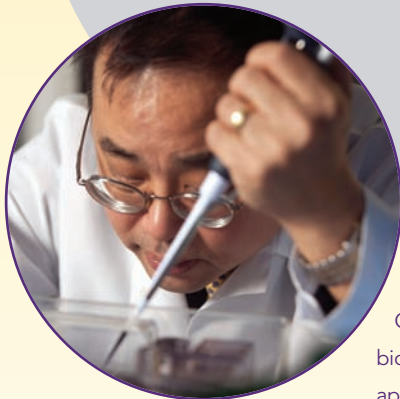
Several clinical studies at our Institute are evaluating and testing novel therapeutic strategies in patients with B-cell or T-cell lymphoma.

—Francisco Hernandez-Ilizaliturri, MD





# Developing new strategies against MULTIPLE MYELOMA



Multiple myeloma (MM), a cancer of plasma cells (PC), normally the source of antibodies that protect against infection, is the second most prevalent hematologic malignancy after non-Hodgkin lymphoma in the United States. Just like their normal PC counterparts, MM cells are critically dependent on their interactions with normal cells within the bone marrow (called bone marrow stromal cells (BMSC)) for their survival. **Kelvin Lee, MD**, Professor of Oncology and Chair, Department of Immunology, and his lab team are investigating the molecular and biochemical nature of the interaction between myeloma cells and the BMSC, in order to develop a new approach to attacking myeloma cells—not directly, but through the “soil” in which they grow.

The Lee lab was one of the first to recognize that a specific cell surface receptor, called CD28, best characterized in T cells, is essential for myeloma cell survival. The lab’s investigators are now studying novel treatment strategies that block the interaction between the CD28 receptor on multiple myeloma cells and CD80/CD86 ligands on the pro-survival stromal cells in the bone marrow microenvironment. This approach aims to kill myeloma cells and sensitize the remaining cells to chemotherapy.

Dr. Lee is also developing new vaccine strategies against myeloma, using novel vaccines developed and clinically tested by the RPCI Center for Immunotherapy. These are combined with small-molecule agents that can reverse the immune system suppression caused by multiple myeloma. “There is evidence that the immune system can control multiple myeloma,” says Dr. Lee. “Anti-myeloma vaccines may have considerable promise in early-stage patients, or in patients with a minimal amount of residual disease.”



## Clinical Pharmacy Support

RPCI’s clinical pharmacy specialists work closely with physicians, nurse practitioners and physician assistants in both inpatient and ambulatory care settings to provide optimal pharmaceutical care to patients. Two clinical pharmacists are dedicated to the Lymphoma/Myeloma Service to monitor all therapeutic drugs, provide recommendations for growth factor support, antiemetics and pain control, offer medication reviews and patient discharge counseling, and staff a 24-hour hotline to offer drug information, interaction checks, dosing recommendations for renal and hepatic insufficiencies, and more.

# Setting the National Standards

Roswell Park Cancer Institute (RPCI) plays a key role in developing the National Comprehensive Cancer Network (NCCN) guidelines that specify the best ways of preventing, detecting and treating specific cancer types. The evidence-based NCCN guidelines are the most widely used standards for cancer care.

● = NCCN Cancer Centers



Dr. Czuczman

## Myron Czuczman, MD

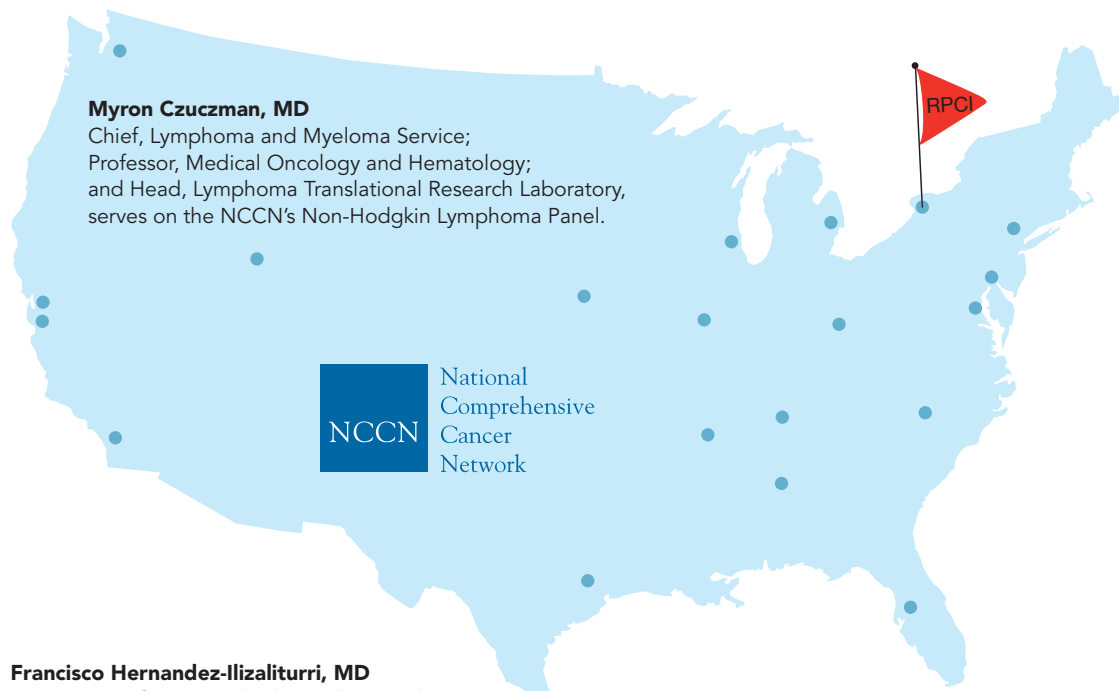
Chief, Lymphoma and Myeloma Service; Professor, Medical Oncology and Hematology; and Head, Lymphoma Translational Research Laboratory, serves on the NCCN's Non-Hodgkin Lymphoma Panel.



Dr. Hernandez-Ilizaliturri

## Francisco Hernandez-Ilizaliturri, MD

Associate Professor, Medical Oncology and Tumor Immunology; serves on the NCCN's Hodgkin Lymphoma and Multiple Myeloma Panel.



Visit [www.nccn.org](http://www.nccn.org) for more information.

# Refer A PATIENT



**Tracy Roach**  
Patient Access Coordinator  
(716) 845-5902

We work continually to fortify existing partnerships with the community physicians who entrust their patients to RPCI.

When you suspect or diagnose cancer in your patient, you want the best treatment and care available for that patient. At RPCI, we believe in a multidisciplinary team approach. As your patient's primary physician, you remain a key member of this team. We will work closely with you and keep you informed of your patient's treatment and progress. After treatment has been completed and your patient returns to your care, we will continue to provide assistance as needed.

With even a suspicion of cancer, your patient can call us and one of our referral professionals will walk him or her through the referral process, answer questions and set up an appointment with the cancer care specialist best suited to the case.

Patients may be referred by a physician or may directly seek a consultation and treatment. The Patient Referral Office is open Monday through Friday, 8 am - 5 pm.

**Call 1-800-ROSWELL (1-800-767-9355) to seek a consultation or second opinion, or to refer a patient.**