

Pathways

Oncology news from Gilead

Fall 2013 (Issue No. 1)

Welcome to the first issue of *Pathways*, a periodic update from Gilead Sciences on the company's oncology research programs and the people and institutions we're partnering with to help advance cancer care. The name of this newsletter has two meanings. The first is a reference to the cell signaling pathways that are the current targets of our oncology research. The second refers to the "path" Gilead plans to follow in working with the oncology community to help patients. We encourage you to share *Pathways* with your colleagues.

Gilead's Vision in Oncology

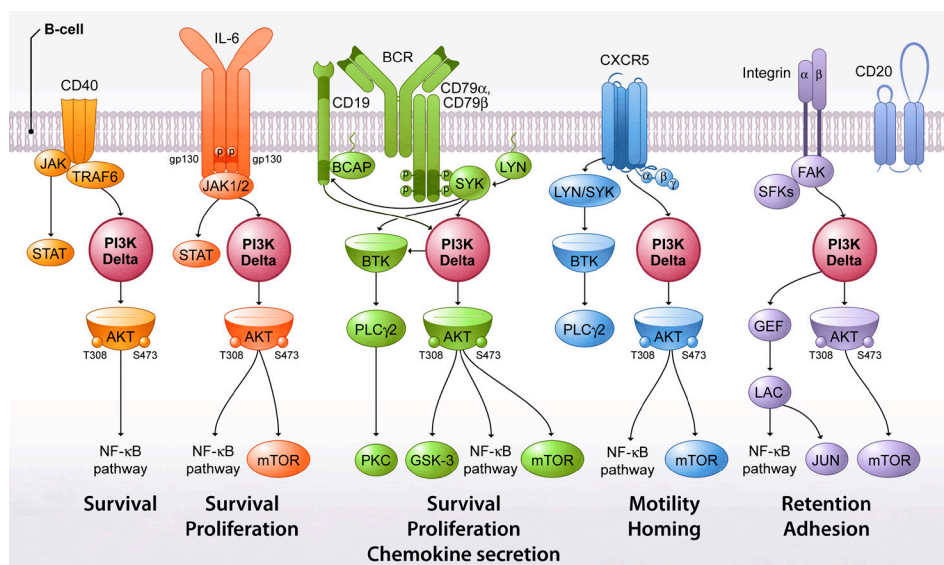
For more than 25 years, Gilead has worked to develop medicines that address areas of unmet medical need for patients worldwide. The company has gained expertise in oncology in recent years through strategic acquisitions, new partnerships and the appointment of cancer researchers. We are now advancing a pipeline of novel investigational therapies for a range of cancers, including agents that target key intracellular signaling pathways and the cellular microenvironment involved in the development and proliferation of a variety of malignancies.

Gilead recently filed for regulatory approval of an investigational, targeted, oral inhibitor of PI3K delta for the treatment of indolent non-Hodgkin's lymphoma (iNHL) in the United States and for iNHL and chronic lymphocytic leukemia (CLL) in the European Union.

Key Targets for Drug Development

Gilead's oncology pipeline focuses on targeted therapies that inhibit certain signaling proteins and pathways involved in the development and proliferation of a variety of cancers.

PI3K Delta Signaling Pathways



Multiple signaling pathways direct B-cell development and function. The effector molecule PI3K delta plays a central role in several of these pathways, helping to promote B-cell activation, differentiation, proliferation and survival.

Phosphatidylinositol 3-kinase (PI3K) delta and **spleen tyrosine kinase (Syk)** are intracellular signaling proteins that are essential components of proliferation and survival pathways in B cells, a type of white blood cell that plays a central role in the immune system. In many B-cell cancers, such as CLL and iNHL, hyperactive PI3K delta signaling and abnormal Syk activity help lead to the growth and survival of cancerous cells.

The Janus kinase (JAK) proteins are a family of enzymes that govern cell proliferation, differentiation, and survival and mediate several signaling pathways. JAKs have been implicated in a number of disorders, including myeloproliferative diseases, inflammatory disorders and certain cancers.

Lysyl oxidase-like-2 (LOXL2) is a protein that promotes the cross-linking of collagen fibers in the extracellular matrix, a component of the cellular microenvironment that influences cell development, migration and proliferation. The extracellular matrix can sustain tumor growth and make it difficult for anticancer drugs, including both conventional therapies and targeted agents, to attack malignant cells. LOXL2 is produced at a high level in several cancers, including those of the colon and pancreas, and in fibrotic diseases, such as myelofibrosis.

Matrix metalloproteinase-9 (MMP9) is an enzyme that degrades collagen in the extracellular matrix and activates signaling pathways. Overexpression of MMP9 is associated with poor prognosis in various solid tumors.

For information about
Gilead's oncology
clinical trials, visit
www.clinicaltrials.gov.

Meet a Member of Our Team

David McFadden, Senior Director of Oncology Advocacy and Extramural Research

David McFadden, MS, RPh, recently joined Gilead to lead the company's oncology advocacy and extramural research programs. David brings to Gilead more than 30 years of clinical and industry experience, initially as a clinical pharmacy specialist and more recently working with oncology medical societies and patient advocacy groups.

What first sparked your interest in oncology? How did you eventually get involved in clinical research?

The reason I became so interested in this field was my own family experience. I was 12 years old when my dad succumbed to colon cancer – he was only 42. That may have been why I became interested in oncology as opposed to anything else.

Shortly after I earned my master's degree in pharmacy, I was given the opportunity to join the University of Iowa's hospital system as an oncology clinical pharmacy specialist. At the time, there was a dearth of information on how best to treat cancer patients, and clinical research was really needed to help them. Clinical oncology pharmacy was just emerging as its own discipline and I recognized that it would provide me with the greatest opportunity to work directly with patients.

Tell us about your work with patient advocates.

This field is all about the patients. We're still working on connecting the dots between providers, advocates and patients so that they get the best care. Patients need a real human experience; going to the internet is not enough. So that's where I spend most of my efforts with advocacy groups – partnering with the community so that patients can find the best care and support.

What brought you to Gilead?

I was initially impressed by the company's strong scientific focus, including the fact that many of the company's senior staff are scientists. The tipping point was seeing Mike Hawkins [Senior Director of Oncology Clinical Research] give a talk on the company's Syk inhibition research. Mike has worked in oncology for many years, but when he spoke, he was unbelievably animated. That told me that Gilead was a unique company, and I knew I'd be in for exciting times. Everyone I've met here is hardworking, dedicated and enthusiastic.

What do you hope to achieve here?

We want to reach out to trusted professional societies and advocacy groups and keeping them up to date on our work on a regular, ongoing basis. It's important that we develop and maintain true working relationships and make clear that we're invested in improving patient care. All of us here are stakeholders in that endeavor.

Partner Profile: The Lymphoma Research Foundation

To recognize the many important contributions of oncology patient advocacy organizations, each issue of Pathways will highlight one such organization that Gilead works with to improve patient care.

The Lymphoma Research Foundation (LRF) is the largest lymphoma-focused non-profit organization in the United States. For more than a decade, the Foundation has worked to support patients, their loved ones and health care professionals; fund research to help end the disease; and advocate for improved lymphoma policies and services.



Guided by a Scientific Advisory Board of 45 leading lymphoma experts, the Foundation has awarded more than 300 research grants totaling \$54 million for innovative research on new investigational lymphoma therapies as well as fellowships and clinical investigator grants to foster the next generation of lymphoma researchers and clinicians.

More than 62,000 people turn to LRF each year for information and support services. The Foundation's Helpline provides advice to patients with lymphoma and referrals to financial assistance for treatment, and it also connects them to clinical trials of investigational therapies. In addition to providing essential information, LRF helps people living with lymphoma make personal connections with others affected by the disease. The Foundation's support services include online communities for patients and their families and the Lymphoma Support Network, a one-to-one peer support program that matches patients and caregivers with others who have had similar experiences and challenges dealing with the disease.

Many of those served by LRF attend the Foundation's annual North American Educational Forum on Lymphoma. The event brings together hundreds of patients, advocates, family members and providers to discuss their treatment experiences as well as the latest lymphoma research. This year's meeting, held in late September in New York City, included survivor stories, research updates and breakout sessions on specific lymphoma subtypes, treatment side effects and health insurance issues.

LRF's latest patient support initiative is Focus on Lymphoma, a new mobile app designed for people with lymphoma. The app allows patients to learn more about their disease; track their symptoms, medicines and doctor appointments; and connect with LRF. The app is available for iOS and Android devices.

Gilead is proud to support organizations such as the Lymphoma Research Foundation in an effort to fight lymphoma and improve life for everyone affected by the disease.



For more information about Gilead's work in oncology, contact
Gilead Public Affairs (public_affairs@gilead.com),
visit www.gilead.com or follow Gilead on Twitter ([@GileadSciences](https://twitter.com/GileadSciences)).