American Brain Tumor Association Patient and Family Conference in July

The American Brain Tumor Association, or ABTA, hosts a yearly conference for patients and their families near its headquarters in Chicago. This year, they have invited neuro-oncologist Jennifer Connelly, MD, to speak as a leading expert in the field of neuro-oncology. She has been asked to present on how palliative care may benefit patients with brain tumors and palliative care’s role from diagnosis to bereavement. The emphasis will be how families and patients can maintain hope and quality of life, even when brain tumor treatments fail.

This year’s ABTA conference, “Providing and Pursuing Answers: Advances in Research, Treatment and Care,” will be held July 25 - 26, 2014, at the Renaissance Chicago O’Hare Suites. Dr. Connelly’s presentation will be Saturday, July 26, at 11:15 a.m. Should you be interested in attending the conference, additional information can be found at the ABTA website: www.braintumorconference.org.
Magnetic resonance imaging (MRI) has become the preferred method of taking images of soft tissue in the body. Multiple sclerosis (MS) was the disease that propelled early MRI systems to broad acceptance. Prior to the advent of MRI, MS was a disease of exclusion. Once the neurologist ruled everything else out, the diagnosis of MS was presumed. But MRI changed that with the ability to detect the white matter changes that are the hallmark of MS. MRI can detect the increased concentration of water in the lesion with very high sensitivity.

However, the changes MRI detects may come from many causes. For example, a lesion detected by MRI could in some cases be caused by MS or a brain tumor. One tool used in diagnosis is the knowledge of occurrence rates of diseases in different populations. The patients who are afflicted with MS are largely young adults and almost always those born north of the 40th parallel. Now suppose you have a male patient in his early 40s, born in Wisconsin who sees his neurologist with complaints of double vision. His MRI demonstrates a lesion in the white matter of the visual cortex in his brain. You are left in a quandary. Do you treat him for MS, presuming the best case for his future? If you do so and the lesion is actually a tumor, then you will have lost valuable time and perhaps the opportunity to treat the tumor aggressively for the best possible outcome. To resolve this quandary, you could do a biopsy of the lesion and find out definitively what the lesion is. However, if the lesion is MS, you will have given your patient a brain injury.

In October of 1994, we had just such a case. For the first time, we used magnetic resonance spectroscopy to resolve the issue. While MRI pinpoints the exact location of a tumor in the brain, MR spectroscopy measures biochemical changes in the brain: it will compare the chemical make-up of healthy brain tissue with abnormal tumor tissue.

Using MR spectroscopy, we were able to provide a definitive diagnosis: our patient had a low-grade brain tumor and went on to receive the most appropriate treatment.

Another way to understand the differences and complimentary natures of the MR Imaging and MR spectroscopy is to make an analogy to satellite imagery. If you’ve ever used Google Maps or MapQuest, you know you can see maps and images of the structures on the ground. MR imaging is like this function:

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Cancer is a complex disease, and glioblastoma multiforme (GBM) is no exception. Even after surgery, radiotherapy and chemotherapy, less than 10 percent of GBM patients survive longer than five years. With limited treatment options and no cure, there is a critical need for new treatment. Moreover, a treatment that works well for one person may not work well for another; thus, individualized treatment planning is especially critical.

Understanding molecular mechanisms and proteomic pathways that are different in short-term and long-term survivors will help us identify specific inhibitors to target in these two groups of patients. And that may lead to targeted therapy options for the 90 percent of patients who face long-term survival challenges.

Identifying proteins that facilitate various cellular events during disease is made possible with advances in mass spectrometry-based proteomics. Proteomics is the study of proteins, including their location, function and interaction and how much is produced (expressed) in a cell, tissue or organism.

Mass spectrometry, or MS, is highly advanced technology that measures biochemical changes in brain tissue. Measurements that once needed large tissue samples and intricate chemical manipulations can now be done with a brief shot of laser light on a pinprick-sized sample of a tumor cell.

We are studying GBM proteomics to identify protein signatures from tumor tissue and plasma. Using MS-based proteomics, we hope to:

- Identify GBM biomarkers
- Predict response to the drug bevacizumab (trade name: Avastin) in patients who have recurring tumors
- Predict survival

We developed an MS-based proteomics approach to identify the different ways proteins are expressed in GBM. We have been analyzing proteins from GBM patient tumor specimens and comparing them with brain tissue from a control group — patients undergoing surgery for epilepsy.

The large datasets we generate using MS must be processed by powerful tools for bioinformatic analysis. We are using software called Visualize, developed by staff of the Medical College of Wisconsin Biotechnology and Bioengineering Center, to quantify GBM and epilepsy proteomes. Characterizing proteins that are specific to GBM will help us understand how the proteins interact, function and influence the development of GBM.

Further identification of upstream regulators may provide new therapeutic targets. Using a technique called Ingenuity Pathway Analysis, we identified several proteins related to tumor progression and glioma activation, suggesting our approach is effective in identifying GBM biomarkers.

We are also analyzing plasma proteome from GBM to identify plasma biomarkers. Keeping in view the diverse nature of tumor tissue, it is more significant to identify protein signatures in plasma, which is easier to access.

Moreover, in GBM, it is known that the blood-brain barrier is disrupted. The disrupted blood-brain barrier may lead to proteins unique to GBM being released into the bloodstream.

This activity can be identified using plasma protein analysis. The GBM-specific protein signatures we identify within tumor and plasma are correlated with overall survival to identify signaling pathways that are different in short-term and long-term GBM survivors. These survival pathways not only predict prognosis, but also open avenues to develop new targeted therapies. Early prediction of prognostic outcomes will enable clinicians to make important clinical decisions regarding appropriate therapy or may even suggest clinical trials for further exploration of new treatment. This is critical for GBM patients and may allow us to help improve longevity and quality of life.

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Magnetic Resonance (continued from pg. 2)
it tells you ‘what’ is ‘where.’ But those images don’t tell you what is in the structures you see on the ground. If they are houses, are they occupied by families, elderly retirees or single people? Better yet, is that structure under the roof used as a residence or a business? MR spectroscopy gives us clues about what is going on inside the structures.

When imaging the brain, MRI is an extremely valuable tool to look for things that are out of place, like lesions which may or may not be cancerous. MR spectroscopy can then give us an idea of what is in those lesions. When used together, MRI and MRS are very useful in diagnosing new disease as well as following the progress of treatment.
Support Groups and Events

The Froedtert & the Medical College of Wisconsin health network offers support groups and sponsor events of interest to brain tumor patients and their families.

BRAIN TUMOR SUPPORT GROUP
The Brain Tumor Support Group is for patients and family members who are looking for information and encouragement. Meetings are designed for open discussion of concerns related to brain tumors, with many sessions featuring speakers who focus on a variety of topics specific to this disease.

CANCER CAREGIVERS SUPPORT GROUP
This support group is for friends, family members or others caring for people with cancer. It promotes open communication of feelings, as well as providing relaxation and stress relief. Various topics of interest to the caregiver will also be presented. (This group is made possible by donations to the Froedtert Hospital Foundation.)

YOUNG ADULT ONCOLOGY GROUP
Children's Hospital of Wisconsin offers the Young Adult Oncology Group for cancer survivors (on and off treatment) ages 18 to 39. This group provides survivorship support, education and offers social activities.

EPILEPSY SUPPORT GROUP
This support group is open to people with epilepsy, their family members or caregivers. The group is in affiliation with the Epilepsy Foundation of southeast Wisconsin. There is a guest speaker each month talking on topics of interest related to seizures.

CALENDAR

Brain Tumor Support Group
Third Tuesday of each month
6:15–8 p.m.
Open discussion: 6:15–7 p.m.
Featured speaker: 7–8 p.m.
Clinical Cancer Center at the Froedtert Hospital campus
Conference Room L, First Floor

June 17, 2014
Support group is cancelled for this date.

July 15, 2014
Open discussion.

Aug. 19, 2014
Question and Answer Session with Social Services
Anissa Johnsen, MSW, LCSW, Social Worker

Sept. 16, 2014
Talking about cancer to family
Lois Pearson, MEd, CCLS

Cancer Caregivers Support Group
Fourth Tuesday of each month
5:30–7 p.m.
Clinical Cancer Center at the Froedtert Hospital campus
Conference Room J, Lobby Level

June 24, 2014       Aug. 26, 2014
July 22, 2014       Sept. 23, 2014
Various speakers are offered.

Young Adult Oncology Group
Meets monthly; dates and times vary
Sponsored by Children's Hospital of Wisconsin, the Medical College of Wisconsin and Froedtert & the Medical College of Wisconsin Clinical Cancer Center.
More information: Kristin Bingen, 414-955-4148 or kbingen@mcw.edu.

Epilepsy Support Group
Fourth Wednesday of each month
6:30-8 p.m.
Froedtert hospital campus
2NT Conference Room

For more information about our support groups, please visit froedtert.com or call 414-805-3666 or 800-272-3666 (unless otherwise noted).