David A. Wheeler, Ph.D.

David A. Wheeler, Ph.D., is an associate professor in Baylor College of Medicine’s Human Genome Sequencing Center, which he joined in 2001. In the HGSC, Wheeler guided the finishing of the *D. melanogaster* chromosome 3 and X genome sequence in 2002, followed by the human genome sequence, chromosomes 3, and 12, in 2003.

Wheeler is now the director of cancer genomics and assistant director of the HGSC. He leads the development of methods for discovery of genome variation in human and animal populations using DNA sequencing technologies with the goal of relating polymorphism to human disease.

Wheeler received his bachelor of science degrees in biochemistry and zoology from the University of Maryland and a master of science in biochemistry from the George Washington University. He earned his Ph.D. in genetics from the George Washington University and conducted postdoctoral research in behavioral genetics at Brandeis University.

Genetic testing and cancer

In certain types of cancer, genetic testing is already available for high-risk populations, such as family members of women with breast and ovarian cancer. These tests screen for genetic mutations that are proven to raise that family member’s risk of developing cancer. One of the newer, more widely known tests is for the BRCA1 and BRCA2 gene mutations.

Multiple factors should be considered when deciding which family members of breast and ovarian cancer patients should receive this test, experts say. Those include what type of cancer, how old and how close the relation is.

It also depends on what exact type of mutation the family member with cancer has, which is why involving genetic counselors in the decision making process is critically important. Genetics experts can assess a person’s family history and determine if testing is necessary. These resources are currently available to patients in the Lester and Sue Smith Breast Center at BCM. For more information call, 713-798-1999.

For more information about The Partnership for Baylor College of Medicine, call 713-798-5460 or visit our website at www.bcm.edu/advancement/partnership.
Breast Center experts offer hereditary breast cancer prevention information

As breast cancer genetic research continues to advance, more education on breast cancer prevention in high-risk women is a top priority amongst the breast cancer community.

Dr. Julie Nangia, assistant professor, and Sarah Zentack, genetic counselor, both of the Lester and Sue Smith Breast Center, have been involved in the education efforts regarding this very important topic.

They participated in a webinar hosted by The Breast Health Collaborative of Texas that gave breast cancer advocates, supporters and healthcare providers access to the most up-to-date research and practice guidelines for hereditary breast cancer prevention.

Identifying high-risk women is key to early prevention, and early prevention saves lives, Nangia said. “Having a strong family history puts a woman at a very high risk.”

There are also known genetic mutations that may significantly increase the risk of breast cancer. “We have genetic tests available for the BRCA1 and BRCA2 genes,” said Zentack. “We consider multiple factors when deciding which family members of breast cancer patients should be tested, including what type of cancer, how old and how close the relation is.”

Involving genetic experts such as Zentack in the decision making process can best help assess the need for testing. Testing can be more than $4,000.

High-risk women should be more aggressively screened and have preventative surgeries, they said. They should also use preventive agents. Chemoprevention with Tamoxifen or Raloxifene can reduce breast cancer risk by 50 percent.

Nangia and Zentack stressed that there is much to be learned about the genetics of breast cancer. “I think it’s important to emphasize lifestyle changes in breast cancer prevention,” said Nangia. “You cannot change your genes, but you can change your alcohol intake, weight and exercise schedule. These are all key behaviors associated with breast cancer.”

Some of the groups attending the seminar included the Houston, Dallas and Austin affiliates of the Susan G. Komen Foundation for the Cure®, the Sisters Network, Women with Cancer and community health centers in Wichita Falls, San Antonio and Corpus Christi.

The Breast Health Collaborate is the coordinating body influencing education, funding, and policy by serving as a resource for breast health issues and services. Nangia serves at BCM’s representative for the collaborative.

Osborne continued from cover

the aromatase inhibitors, and trastuzumab in breast cancer. His group has also published extensively on the role of various biomarkers and other genetic changes as predictors of prognosis or response to treatment. As previous chair of the Breast Cancer Committee for the Southwest Oncology Group, he directed numerous clinical trials investigating new treatment strategies in primary and metastatic breast cancer.

Since 1992, he has served as co-director of the San Antonio Breast Cancer Symposium, the largest breast cancer meeting in the world.

Osborne received his A.B. and his M.D. from the University of Missouri, both with honors. He completed his internship and residency at Johns Hopkins, and followed this with three years as a clinical associate at the Medicine Branch of the National Cancer Institute. He was a faculty member at the University of Texas Health Science Center at San Antonio from 1977 until 1999, becoming chief of medical oncology in 1992. He moved to Baylor College of Medicine in 1999 to direct the new Breast Center now known as the Lester and Sue Smith Breast Center.

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2012 Pink Ribbon House Fundraiser kicks off

The Pink Ribbon House®, one of the largest and most popular fundraisers benefiting research and patient care at the Lester and Sue Smith Breast (www.bcm.edu/breastcenter) at Baylor College of Medicine, has kicked off its sixth biennial campaign.

The unique project features a designer showcase home. Funds are raised through home tours, corporate and individual sponsorships and individual contributions.

“The Pink Ribbon House project has been an amazing vehicle for the Smith Breast Center in terms of increasing community awareness of what in 2003 was a new breast cancer clinical care and research program in Houston,” said Dr. Kent Osborne, director of the Smith Breast Center. “It has also provided funding to support our missions of research and community outreach, especially the underserved.”

Established in 2003 by the Lester and Sue Smith Breast Center Advisory Council, the project has raised nearly $2.5 million for the Smith Breast Center.

The Advisory Council is made up of women in the Houston community who together support the Smith Breast Center’s research and patient care missions through various philanthropic activities.

Debby Leighton, chairman, and Mary Sapp Fischer, co-chairman, both members of the Smith Breast Center Advisory Council, are leading a strong team of volunteers for the 2012 project.

This year’s house is currently under construction in Memorial’s Hunters Creek Village. Designed by Hollenbeck Architects (www.hollenbeckarchitects.com), the French country-style home is being constructed by Levitt Partnership, Ltd.

The 5,000-square-foot-home will feature a stone and stucco exterior with shutters, five bedrooms, five-and-a-half bathrooms, two studies, three fireplaces, as well as a summer kitchen, playroom, three-car garage, game room, and dining room that opens up to a courtyard with a water feature.

Unlike previous years, the home will not be built as a spec home.

Leading Houston interior designers will decorate the home including Valerie Cook, Julie Blalock, Rachel Reppond, Belinda Bennett, Lauren Amber Prestenbach, Christine Ho, Julie Dodson, Trisha Dodson, Leslie Sinclair, Molly Sullivan, Levitt and Molly Oshman.

The home will be available for public tours on the weekends April 27th and May 4th.

For more information or to become a sponsor, please contact Kaiti Kling at 713-798-4058 or ekling@bcm.edu.
Sequence of Ovarian Genome Identifies Predominant Gene Mutations, Points to Possible Treatment

In June 2011, members of The Cancer Genome Atlas, including the Baylor College of Medicine Human Genome Sequencing Center, published new findings in ovarian cancer.

The genome of the most common form of ovarian cancer is characterized by a few common gene mutations but also surprisingly frequent structural changes in the genome itself, the members said who sequenced and analyzed 300 such tumors. The study was the first to achieve an overview of this type of ovarian cancer.

“We found that ovarian cancer has a dramatic pattern of genomic disruption,” said Dr. Richard Gibbs, director of the Baylor Human Genome Sequencing Center and an author of the report that appears in the current issue of the journal Nature. The BCM Center completed one-quarter of the sequencing.

The study found that 96 percent of the tumors had mutated TP53 genes. When normal, this gene is a tumor suppressor. Its loss allows tumors to develop without check. Nine other mutated genes occur at much lower but statistically significant rates. Among these are NF1, BRCA1, BRCA2, RB1, and CDK12. BRCA1 and BRCA2 (known primarily as breast cancer genes) were mutated in 30 percent of patients while the occurrence of the other mutations was much lower. Some BRCA1 and BRCA2 mutations were inherited while others occurred spontaneously in the breast tissue.

“A globally disrupted genome is the common theme in this cancer,” said Gibbs. “Large-scale amplifications and deletions of chromosome segments make this cancer very complex.”

“This landmark study is producing impressive insights into the biology of this type of cancer,” said National Institutes of Health Director Dr. Francis Collins. “It will significantly empower the cancer research community to make additional discoveries that will help us treat women with this deadly disease. It also illustrates the power of what’s to come from our investment in The Cancer Genome Atlas.”

While the mutation pattern seemed simple, the researchers found that, this form of ovarian cancer “demonstrates a remarkable degree of genomic disarray.”

In particular, the authors point to the frequency of somatic copy number variations, in which parts of the genome are duplicated or deleted in the tumors themselves. More than half of these tumors had defects in genes that play a role in the repair of defects that occur when cells divide and duplicate their DNA. The authors said that drugs called PARP inhibitors are already used in this diseases and this explains why they are sometimes successful in treating the disease.

“We also defined a set of genes that were associated with worse or better patient outcome,” said Dr. Chad Creighton, assistant professor in the division of biostatistics in the NCI-designated Dan L. Duncan Cancer Center at BCM. He and others on the Genome Atlas team identified a transcriptional signature of 193 genes that predicts survival. (The transcriptional signature involves assessing gene activity by measuring the types and quantities of RNA [genetic material that forms a template from which parts of cell make protein] cells produce.) They correlated 108 genes with poor survival and 85 genes with good survival.

Cancer Genome Atlas

The Cancer Genome Atlas (TCGA) is a comprehensive and coordinated effort to accelerate our understanding of the molecular basis of cancer through the application of genome analysis technologies, including large-scale genome sequencing. TCGA is a joint effort of the National Cancer Institute (NCI) and the National Human Genome Research Institute (NHGRI), two of the 27 Institutes and Centers of the National Institutes of Health, U.S. Department of Health and Human Services.

Since becoming a part of the project in 2007, BCM has led efforts to sequence brain, breast and ovarian tumors.
Smith Breast Center offers one-of-a-kind imaging services

Ask any breast cancer patient or survivor about the diagnostic process and they might tell you how scary and emotionally draining it can be. But at the Lester and Sue Smith Breast imaging center, the staff puts in the extra coordination and time to make this process as pleasant and easy as possible. With the ability to gather the diagnostic mammogram, and if needed ultrasound and biopsy, in one day, it decreases on the patient’s wait time and anxiety.

“The diagnostic process is not so easy at other breast imaging centers and often requires separate appointments for each ‘test step,’” said Dr. Emily Sedgwick, director of the LSSBC imaging center. Dr. Karla Sepulveda serves as co-director of the center. Biopsy results can take up to five days.

“Our imaging specialists and staff work around the clock, hardly taking breaks, to navigate this process,” said Dr. Kent Osborne, director of the Lester and Sue Smith Breast Center. “If a patient is diagnosed with breast cancer, the staff goes the extra mile to have them set up to see a breast center oncologist as soon as possible.”

Spread the word about these unique services

Our advisory council members are integral to spreading the word about the unique services the LSSBC offers. We encourage you all to educate friends and family about the center.

“Early detection saves lives,” said Sedgwick. “We want all women to keep up with their yearly mammograms and knowing that it can be a positive experience might help.

In addition to the expedited diagnostic process, the LSSBC imaging center is “all-digital.” Digital mammography has been shown in studies to detect cancer more effectively in younger, premenopausal women who have dense breast tissue.

The Partnership for Baylor College of Medicine

Purpose
The Partnership is organized as an association of volunteers committed to the purpose of supporting Baylor College of Medicine through Advocacy, Philanthropic Support and Fundraising Support activities, working independently or with other College Support Groups.

Mission
The Purpose of the Partnership is achieved through its Mission of

A. Advocacy – Acting as knowledgeable Goodwill Ambassadors for the College, to inform the citizens and organizations of our community, state and country of the activities of the College, including medical education, medical research, patient care and community outreach programs.

B. Philanthropic Support – Assist the College with identification, cultivation and solicitation of major, annual and planned gifts from individuals, foundations and corporations.

C. Fundraising Support – Serve as a fundraising organization by sponsoring selected fundraising events to support priority projects as proposed by the College.

To join or to learn more about The Partnership, please visit our website at www.bcm.edu/advancement/partnership or call 713-798-3160.

Genome and Breast Centers receive renewal of important designations

The Baylor College of Medicine Human Genome Sequencing Center (http://www.hgsc.bcm.tmc.edu/) has received a four-year, $85.2 million renewal award from the National Institutes of Health National Human Genome Research Institute (www.genome.gov).

Directed by Dr. Richard Gibbs, the Baylor Genome Sequencing Center seeks to advance the study of genomics and its use in the diagnosis and treatment of disease.

The renewal will fund new center-initiated genomic projects that will be chosen in collaboration with other designated centers, including the Genome Institute at Washington University in St. Louis (http://genome.wustl.edu) and the Broad Institute of MIT and Harvard (www.broadinstitute.org) and experts at the NHGRI.

The BCM center was established in 1996 when the NHGRI designated it as one of six pilot programs for the final phases of the Human Genome Project.

In 1999, the BCM was chosen as one of three sites from the pilot program to complete the Human Genome Project.

BCM’s Dan L. Duncan Cancer Center (www.bcm.edu/cancercenter/) received renewal as a National Cancer Institute-designated cancer center, a prestigious honor that recognizes the group for scientific and clinical excellence.

The Duncan Cancer Center first received NCI designation in July 2007 (www.bcm.edu/news/packages/nci.cfm).

NCI-designated cancer centers must be exceptional sources of discovery and development of more effective approaches to cancer prevention, diagnosis, and treatment. They also deliver medical advances to patients and their families, educate health care professionals and the public, and reach out to underserved populations.

To continue operating as a NCI-designated cancer center, the Duncan Cancer Center team participated in a nationally-competitive, peer-review process, which evaluated the depth, quality and integration of its efforts to translate laboratory discoveries to clinical care and disseminate new knowledge through outreach and education to the local and regional community.

Particular strengths were noted in the cell and gene therapy, nuclear receptor, breast and pediatric programs. The review also encompassed an evaluation of scientific shared resources which enable investigators and programs to do amazing work.

As part of the renewal, the Duncan Cancer Center will receive more than $15 million in NCI funding over the next five years. There are 66 NCI-designated cancer centers total in the United States.