Pathology underlies all of medicine. By examining changes in tissues, blood, DNA, and other specimens, pathologists study the ways in which diseases affect the body. Thus Pathology provides a foundation for every aspect of healthcare and biomedical research, from diagnostic testing and monitoring of chronic diseases, including cancer, to blood transfusion technologies.
**A CALL TO ACTION**

Rising to the Challenge: The Campaign for Johns Hopkins will raise unprecedented levels of support to attract, sustain, and further empower the people of Johns Hopkins—our students, faculty, and researchers—who through their work improve the lives of millions around the world. Together with our philanthropic partners we will:

**ADVANCE DISCOVERY AND CREATIVITY** through support of our exceptional faculty and researchers. Their innovative work drives the development of new knowledge, new forms of expression, and new ways to save lives and improve health, and furthers progress across our core disciplines in science and technology, the humanities and arts, and public health and medicine.

**ENRICH THE STUDENT EXPERIENCE** by investing in scholarships and fellowships, inspirational spaces for collaborative learning and social opportunities, and new programs that will enhance student-faculty interactions, ensure diversity on campus, link learning in the classroom to life after graduation, and strengthen connections between our students and our surrounding communities.

**SOLVE GLOBAL PROBLEMS AS ONE UNIVERSITY** by creating new cross-disciplinary solutions in crucial areas such as sustaining global water resources, revitalizing America’s cities, advancing individualized and population health, and understanding how we learn and teach.

Department of Pathology is committed to playing a key role in the success of the campaign. Please join with us in this important mission.

At Johns Hopkins University, the Department of Pathology is one of the largest departments in the School of Medicine. Our clinical reach is extensive. Nearly all of the pathology laboratory testing for Johns Hopkins patients is conducted within the Department, which also provides oversight for the approximately 12,871,000 pathology tests performed annually throughout the Hopkins healthcare system at six hospitals and 30 outpatient facilities.

Education is a core purpose of the Department of Pathology. Through teaching, mentoring, and formal training programs, the Department educates medical students, residents, fellows, and graduate students. We offer residency programs in anatomic pathology, clinical pathology, and both combined, as well as 16 post-residency fellowship training programs.

Research is the Department’s signature strength. Multidisciplinary collaboration, incorporation of genomic/proteomic studies, and moving discoveries from “bench to bedside” characterize the research efforts at Johns Hopkins.

The Department of Pathology is recognized as a research powerhouse in the fields of cancer, infectious diseases, neurodegenerative diseases, and immunology; productive ongoing research targets for Alzheimer’s disease, HIV prevention and treatment, parasitology, cell-mediated immunity, leukemia, and pancreatic, colon, breast, ovarian, and cervical cancer. All Pathology faculty actively engage in research. At any given time, there are more than 70 active grants and contracts through the National Institutes of Health (NIH). The Department leads major clinical trial research programs in pathology in Uganda and China, involving 350 investigators and staff.

The domain of Pathology is vast, but our approach is highly targeted. The Department focuses intensively on diseases in which they can exert maximal impact—in terms of advancing scientific understanding of disease, and generating new knowledge that leads to better patient care.

**OVARIAN CANCER: THE SILENT KILLER**

Approximately 22,000 women are diagnosed with ovarian cancer in the United States each year, and annually, 13,580 women die from the disease. Ovarian cancer is known as the silent killer because most women with ovarian cancer are not diagnosed until after the cancer has spread, and is no longer curable. Seventy-five to eighty percent of all ovarian cancer patients are diagnosed with advanced stage disease at initial presentation; the cancer type responsible for 90% of ovarian cancer deaths, high-grade serous carcinoma of the ovary, is confined to the ovary at diagnosis in less than 1% of cases.

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**THE DEPARTMENT OF PATHOLOGY AT A GLANCE**

- 115 full-time faculty
- 110 fellows
- 34 residents
- 45 graduate students
- 1,200 staff employees
Subject: RISING TO THE CHALLENGE

Faculty in the Department of Pathology have made a startling discovery: the earliest changes in ovarian cancer development occur not in the ovary but in the fallopian tube. Based on cutting-edge genomics research, this fundamental advance in our understanding of ovarian cancer can form the basis for new approaches to prevent the disease, and new tests for detecting it early—in time to manage and cure it successfully.

Using results from genetic studies, the ovarian cancer team developed a new vaccine to treat cervical cancer. Even low-grade tumors in the brain therefore can cause significant, sometimes debilitating symptoms. High-grade tumors are almost always fatal; for malignant brain tumors, little progress has been made in developing effective new therapies. The average survival after diagnosis with one of these tumors is less than two years.

New methods of prevention, detection, and treatment are desperately needed. In the Department of Pathology, research is focused on understanding the molecular changes which drive the formation and growth of brain tumors; with this understanding, they are developing new therapies which target these changes. They have already found that treatment-resistant cancer stem cells progress along the same molecular pathways as normal fetal brain cells. This knowledge allowed the Department of Pathology to identify drugs that target the relevant pathways, to destroy the cancer-producing stem cells.

To encourage rapid progress in brain tumor research, the Department of Pathology proposes to create a Brain Cancer Research Center. The Center will unite current Pathology faculty, newly recruited physician-scientists devoted to translational brain cancer research, and faculty in the Departments of Oncology, Neurology, Neurosurgery, Radiology, and Radiation Oncology. Teams of scientists will use the latest technologies and research approaches, such as cutting-edge sequencing of large numbers of tumors, to make major discoveries—and then, based on these discoveries, to develop effective treatments.

Subject: DEPARTMENT OF PATHOLOGY

Despite these grim statistics, there is substantial hope.

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Subject: TRAUMATIC BRAIN INJURY: LITTLE PUBLIC AWARENESS, DESPITE NEAR-EPIDEMIC PROPORTIONS

Traumatic brain injury is the leading cause of death and disability for individuals from ages one to 44. There are about 1.7 million new cases of traumatic brain injury in the United States every year, most of them from motor vehicle accidents or falls. Although many of these cases are concussions causing minor, transitory, or no change in mental status and symptoms, a substantial number lead to chronic disability because of permanent damage or, in some cases, to progressive disease. Motor vehicle and falls are not the only risks to the brain. Repeat concussions among football players and other athletes may result in chronic traumatic encephalopathy very similar to the dementia pugilistica seen in boxers. The Iraq and Afghanistan wars have exposed some 230,000 soldiers to traumatic brain injury, often related to explosion from mines or intermittent explosive devices; blast injury to the brain has become the signature medical problem of these wars. Traumatic brain injury can have both short- and long-term effects; recent evidence suggests that traumatic brain injury places individuals at greater risk for neurological diseases such as Alzheimer’s disease and Amyotrophic Lateral Sclerosis (ALS, or Lou Gehrig’s Disease).

We propose to create a Traumatic Brain Injury Center. The goal of the Center will be to define the pathology of traumatic brain injury, develop novel animal and cell models of the traumatic brain injury process, and use these models to discover and test effective new therapies such as small organic compounds, trophic factors, and stem cells. The Center will collaborate closely with the Brain Injury Program in the Bloomberg School of Public Health, the Departments of Neurology, Anesthesiology and Critical Care Medicine, Physical Medicine and Rehabilitation, and Ophthalmology, and the Applied Physics Lab at Johns Hopkins University; the Armed Forces Institute of Pathology; the Department of Neuurosurgery at Virginia Commonwealth University; the University of Glasgow Institute of Neurological Sciences, and the traumatic brain injury community locally, nationally, and internationally.

The Traumatic Brain Injury Center will build upon substantial strength here at Johns Hopkins. Within the Department, the Division of Neuropathology has studied tissues from multiple neurological disorders, and has played a central role in developing innovative models of neurological disease. These models are helping advance new drug and cellular therapies. Recently, the Division made pioneering observations about the molecular and cellular mechanisms of brain injury and repair. Working with both human tissue and animal models, faculty have begun to develop innovative therapies. The support of a Center devoted to this critical area of research will powerfully expedite the research, and will facilitate its translation into methods of brain protection, preservation, and recovery for hundreds of thousands of individuals who, each year, suffer a traumatic brain injury.

An estimated 2 to 4 million high school and college students play collision and contact sports, often more aggressively than professional players. The danger entailed was brought into stark light by the death of a Penn football player and team captain, Owen Thomas. In 2010, at age 21, Owen Thomas committed suicide. Detailed autopsy of his brain showed the early stages of CTE, which has been linked to depression and impulse control. The evidence of CTE in Thomas’ brain shocked and befuddled a scientific community raised in the doctrine that such neuropathologies are associated with advanced age.
WHY JOHNS HOPKINS?
On multiple disease fronts, the Department of Pathology at Johns Hopkins is ideally prepared to generate new knowledge leading to improved methods of diagnosis and treatment. A critical mass of collaborating researchers have been assembled, many of whom are leaders in their field. The Department has the leading cancer genome sequencing team in the world; this is of vital importance in ovarian and brain cancers, which are fundamentally genetic diseases caused by damage to the DNA. Likewise, due to their clinical involvement in analyzing and describing brain tumors resected from patients, the neuropathology team is optimally positioned to lead efforts aimed at developing models to understand brain tumors and the development of brain tumors arising from DNA damage. The Department has the leading research center in ovarian cancer, and the “real world” of medical care, the scientists can envision, design, test, develop, and disseminate new treatments. In this way, the Department of Pathology is determined to make a significant difference, to improve the health and the lives of patients at Johns Hopkins and worldwide.

PHILANTHROPY: THE CRITICAL SUCCESS FACTOR

While the Department of Pathology may seem well funded, in reality the current research economy provides a severe challenge. Research grants have become increasingly competitive. The success rate for grants submitted to the NIH hit an all-time low of 17% in 2011, down dramatically from 32% in 1999-2003.1 To secure federal grants, our faculty must spend more and more time seeking grant opportunities and writing proposals, all of which directly subtracts from their time available for science.

Philanthropic funds are a life-sustaining infusion to pathology research, providing vital resources and the scientific freedom to move forward with innovative ideas. Ovarian cancer, brain cancer, and traumatic brain injury are immediate and compelling areas in which Pathology can make a difference. Philanthropy can provide the fuel to propel major progress against these diseases.

With numerous health challenges now confronting individuals and society, philanthropic support has never been more essential than it is today, nor has the potential return on investment been more dramatic. At Johns Hopkins, we have the technologies, ideas, momentum, and people necessary for innovation—to overcome major challenges to health and wellness. Philanthropy has the power to catalyze transformative work. It is our hope for the future.