Appropriation/Budget Activity
Defense Health Program/BA-2

Date: January 2005
R-1 Item Nomenclature: 1
In-House Laboratory Independent Research (ILIR)
0601101HP

COST ($ in Millions)	**FY 2004 Actual**	**FY 2005 Estimate**	**FY 2006 Estimate**	**FY 2007 Estimate**	**FY 2008 Estimate**	**FY 2009 Estimate**	**FY 2010 Estimate**	**FY 2011 Estimate**
Total PE 0601101HP Cost	0.000	0.000	2.379	2.424	2.213	2.259	2.304	2.350
(ILIR)	0.000	0.000	2.379	2.424	2.213	2.259	2.304	2.350

A. Mission Description and Budget Item Justification:

This program element supports basic medical research at the Uniformed Services University of the Health Sciences (USUHS) and provides the only programmed research funds received by the University. In addition, it facilitates the recruitment and retention of faculty; supports unique research training for military medical students and resident fellows; and allows the University`s faculty researchers to collect pilot data in order to secure research funds from extramural sources (estimated $25-$30 million annually). Eighty to 100 intramural research projects are active each year, including 20-25 new starts. Projects are funded on a peer-reviewed, competitive basis. Results from these studies contribute to the fund of knowledge intended to enable technical approaches and investment strategies within Defense Science and Technology (S&T) programs.

The ILIR program at USUHS is designed to answer fundamental questions of importance to the military medical mission of the Department of Defense in the areas of Combat Casualty Care (CCC), Infectious Diseases (ID), and Military Operational Medicine (MOM). The portfolio of research projects will vary annually because this research is investigator-initiated. Examples of typical research efforts are:

Combat Casualty Care: Ischemia and reperfusion injury, traumatic brain and peripheral nerve injury, neural control of pain, endotoxic shock, cryotherapy, malignant hyperthermia, inflammation, and wound healing.

Infectious Diseases: Immunology and molecular biology of bacterial, viral and parasitic disease threats to military operations. These threats include scrub typhus; E. coli and their shiga toxins; HIV, HTLV-1, strongyloides, gonorrhea, streptococcus, staphylococcus, hepatitis A, helicobacter pylori, typhoid, malaria, and bartonellosis.

Military Operational Medicine: Sustainment of individual performance; mapping and managing deployment and operational stressors; cognitive enhancement; and military & medical training readiness.

B. Program Change Summary:

COST ($ in Millions)	**FY 2004 Actual**	**FY 2005 Estimate**	**FY 2006 Estimate**	**FY 2007 Estimate**
FY06 Budget Estimate Submission RDT&E	0.000	0.000	0.000	0.000
FY06 Budget Estimates RDT&E	0.000	0.000	2.379	2.424
Total Adjustments	0.000	0.000	2.379	2.424
Congressional Program actions				
Congressional rescissions				
Congressional increases				
Reprogramming	0.000	0.000	2.379	2.424
SBIR/STTR Transfer				
Internal Transfer				

C. Other Program Funding Summary: Not applicable.

D. Acquisition Strategy: Not applicable.

E. Performance Metrics:
Project Number and Title: ILIR/101HP

PROGRAM ACCOMPLISHMENTS AND PLANS

FY 2005 Accomplishments

Not applicable. In FY 2005, ILIR research at the Uniformed Services University for the Health Sciences was funded through the Office of Naval Research (PE 0601152N).

FY 2006 Plans

Infectious Diseases: Representative projects will include epidemiological studies of scrub typhus in the Republic of Maldives; a study of the pathology of infectious diarrhea in monkeys; several studies on leishmaniasis, including transmittal vectors and autosomal resistance mechanisms; an investigation of shigella virulence; analysis of the shiga toxins of E. coli; and several studies of the cellular mechanisms of influenza, malaria, and H. pylori.

These projects all supported the essential military mission by advancing our understanding both the transmission and the internal mechanisms of a spectrum of pernicious and/or common diseases that may be faced by warfighters both at home and abroad. In turn, that understanding opens avenues to better control, diagnosis, and treatment of both natural and manmade biological threats. ($0.333 million)

Military Operational Medicine: Representative projects include the following: An exploration of electrochemical processes in the amygdala, which has partially characterized a mechanism that appears important in the formation and consolidation of emotional memory, will proceed to identify possible mechanisms to protect against adrenergic impairment induced by traumatic stress. A examination of the effects of stress on the suppression of the immune system will include examination of genetic factors that may affect the level and specific nature of impairment. An ongoing rat study of the relations among stress, nicotine, and the effects of using other drugs will investigate effects specific to three common psychiatric illnesses, with special attention to the effects of gender differences. Several projects will investigate mechanisms of the brain to uncover potential enhancement and protection strategies against neurological damage from stress, neurochemicals, and other potential weapons or environmental factors.

These studies support the essential military mission by increasing our understanding of and ability to manipulate the physiological mechanisms of stress and immunity, human sleep and seasonal cycles, and neurological changes necessary to short- and long-term memory. Their discoveries should enable warfighters to stay awake longer with fewer detriments to performance; lead to better strategies for enhancing and preserving memory and reasoning capabilities under battle conditions; help understand and ultimately prevent and treat neurospsychiatric illnesses such as depression and PTSD; and assist deployed troops and their families better prepare for and contend with common, significant stressors. ($1.022 million)

Combat Casualty Care: Representative studies include an ongoing investigation of signal transduction that has now identified two antibodies pinpointing the mu opioid receptor in the brain, an essential step to understanding the mechanism of opiate effects on pain relief and neural functioning. A family of controlled studies of individuals susceptible to malignant hyperthermia (MH) will pursue genetic markers; new, noninvasive diagnostic tests; and a lactate-based mechanism that may explain the sudden, severe symptoms, similar to heat stroke, that such individuals can experience under physical stress. Two studies of traumatic brain injury will look at different means of protecting against further, permanent damage post-injury. A study of ischemia will look for protective mechanisms against further injury post-wounding.

These studies support the essential military mission by further exploring the mechanism of pain control for an established treatment; providing the groundwork for effective treatments to limit nerve damage and encourage regeneration; and identifying a possible cause of life-threatening complications of the combination of exertion and injury common under heavy battle conditions. ($1.025 million)

FY 2007 Plans

Efforts will continue in all of USUHS' major research areas (CCC, ID, and MOM) in FY 2007. Specific investigator-initiated projects compete for funding each year, usually with two-year project periods. Therefore, no detailed description of the research is possible at this time. ($2.423million)