HURRICANE KATRINA - SUMMARY OF IMPACT ON LSUHSC AND FOCUS ON LSUHSC DEPARTMENT OF PHARMACOLOGY

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THE ISSUE
LSUHSC is the primary care provider for all citizens in the State of Louisiana serving ~1,000,000 patients/yr and is the primary educational center for health care professionals in the state including Schools of Medicine, Graduate Studies, Dentistry, Nursing, Allied Health and Public Health. Hurricane Katrina, which struck southeastern Louisiana on Monday August 29th, 2005 has severely impacted the education, service and research mission of the LSU Health Sciences Center, essentially requiring a temporary relocation of the Center to Baton Rouge, which ~60 miles inland from New Orleans. The two major teaching hospitals for LSUHSC in New Orleans (Charity and University Hospitals) were flooded and Charity suffered significant structural damage. There is a tremendous ongoing institutional planning effort for recovery of the academic medical center.

This report focuses on issues regarding one component of this larger picture – that is the Department of Pharmacology and Experimental Therapeutics. Following a brief background and update, specific issues are addressed regarding damage and the strategy for building anew.

OVERVIEW OF GROWTH AT LSUHSC
The past 10 years have witnessed a tremendous state investment in LSUHSC, which has resulted in dramatic growth in its research programs. This investment included infrastructure development, research resources and the successful recruitment of new department heads, a new Dean of the School of Medicine, a new Chancellor of the Health Sciences Center and the creation of a School of Public Health. This has resulted in true sense of mission at the Health Sciences
Center and the recruitment of ~100 new faculty over the past three years. All of this progress has essentially been brought to a halt by the damage and human tragedy inflicted by Hurricane Katrina on August 29th, 2005.

Within the Basic Sciences of LSUHSC, which comprise the primary research divisions and education for the Health Sciences Center, Three new Heads of Basic Science Departments (Pharmacology – 2001, Physiology – 2002, Biochemistry – 2004) were recruited within the last four years and we are currently recruiting a new Head for the Department of Anatomy and Cell Biology. This has resulted in the expected additional recruitment of talented, NIH funded faculty and further infrastructure development in terms of space, equipment and core research support services. Coincident with this growth has been the significant expansion of graduate and postdoctoral research training programs.

The recruitment of Larry Hollier, M.D. as Dean of the School of Medicine from Mt. Sinai Medical Center in January of 2004 and his recent appointment as Chancellor of the Health Sciences Center have provided further impetus for growth and expansion. Thus essentially, you had a group of experienced and respected leaders committed to the development of educational and research programs at the forefront of academic medical centers.
DAMAGE ASSESSMENT

INFRASTRUCTURE

The entire Health Sciences Center was flooded with 3-7 feet of water on the first floor of each building (see Figure 1 versus Figure 2), which destroyed electrical cores, water pumps and fire pumps. This includes 5 major buildings with 5-10 floors. The outside of the buildings suffered minimal wind damage. Time estimates for occupation of Health Sciences Center buildings in New Orleans within a few weeks after the storm ranged from 3-9 months with some occupation of research labs anticipated in February and early spring of 2006.

We have made progress in the retooling of buildings on campus in New Orleans and investigators have been into the buildings to recover research materials needed for program continuation. We completed initial damage assessment, exterior cleaning and first floor cleaning of buildings flooded and we are in the middle of accepting proposals from firms for complete infrastructure servicing. Although information is not complete at this time, it is anticipated that one or two buildings may be operational in January-February 2006 with an additional research building opening in early spring. This time frame may change as architectural and contracting firms provide the actual schedule for remediation.

A detailed report with daily updates can be monitored at http://www.lsuhsc.edu/.

REAGENTS AND TOOLS

A portion of the emergency generators remained operative for two days after the storm until they ran out of fuel – floodwaters and other issues prevented fuel delivery and flooding rendered generators on the first floor inoperative. Water remained around and in the buildings for over two weeks. As a result all reagents and items stored in refrigeration units were lost. Amazingly, thanks to heroic efforts, some animals were rescued and are in excellent health. We were able to make 4-5 trips to recover most, but not all materials stored in liquid nitrogen.

CAREER DEVELOPMENT

The personal damages along with the losses and disruptions of research programs are having a severe impact on many talented new and established investigators. This impact also includes the 24 graduate students in the program and 15 postdoctoral fellows in the department. This includes issues with manuscript generation and publication delays as well as grant submissions and grant renewals, all of which will have a lasting impact on our mission and the many contributions of the individual research programs in Louisiana supported by the National Institutes of Health and the National Science Foundation.

EQUIPMENT - Damage assessments are in progress.
Figure 1: LSUHSC research building complex in Medical Center in New Orleans prior to Hurricane Katrina. University Hospital is to the left of the buildings and Charity Hospital is to the right of this image.
Figure 2: LSUHSC research building complex in Medical Center in New Orleans Wednesday August 31, Two days after Hurricane Katrina.
OVERVIEW OF THE DEPARTMENT OF PHARMACOLOGY

Dr. Stephen M. Lanier was recruited as the Lederle Laboratories/David R. Bethune Professor and Head of Pharmacology in March 2001. Over this time period, the department has renovated over 14,000 sq ft of modern laboratory space, recruited eight tenure-track/tenured faculty, five research track faculty, quadrupled departmental NIH funding, expanded graduate training and evolved professional educational programs. Areas of research interest within the Department include cardiovascular biology, behavioral pharmacology, drug metabolism, neuroscience and cancer biology. The total annual NIH funding in the Department of Pharmacology is now ~$6,000,000 total costs. With the expansion of the program, we have moved from a rank of 78 to the top 32 among Departments of Pharmacology in U.S. Medical Schools.

The overall theme of the department encompasses a unique niche among programs across the country, due to its emphasis on core pharmacological principles encompassed within the umbrella of systems pharmacology. The plan for the development of the Department was focused on the theme of “Integrative Pharmacological Sciences”. This theme, where we can exploit molecular information in the context of systems biology, will be crucial for harvesting the fruits of the human genome, developing new therapeutics and providing the best possible education for our health care professionals. We are particularly excited by progress toward our goal of establishing this program in “Integrative Pharmacological Sciences” and the unique place this program occupies among programs nationwide.

This theme provided a niche for growth and was essentially made possible by the strong, mid-career faculty with funded research programs in the area of more “classical” whole animal pharmacology that were already in place when Dr. Lanier was recruited to LSUHSC. Over this period, we built upon this core by recruiting additional faculty with a variety of molecular and model organism expertise and establishing core support services for Cardiac and Vascular Function, Cell and Molecular, Histology, Proteomics and Imaging.

The human tragedy inflicted by Hurricane Katrina has disrupted this initiative.
Following evacuation from New Orleans, two days after the storm the Department of Pharmacology set up an office and base of operations at Pennington Biomedical Research Center – LSU in Baton Rouge based upon ongoing collaborative efforts. Administration and support services for the Health Sciences Center also established in Baton Rouge. An organizational center was established at the LSU systems office in Baton Rouge during the storm and this served as base camp for leadership and staff. Information was provided through the LSUHSC web site and phones to answer questions from students, staff and faculty.

The Health Sciences Center – New Orleans was temporarily established in Baton Rouge and began classes Monday Sept 26th for all its schools. All of the infrastructure required for operations were quickly established (i.e. Information Technology, Human Resources, Benefits, Grants administration). All of our financial systems became operational within two weeks of the storm and all payroll delivered. This has been a tremendous undertaking.

One of the biggest challenges in completing the operational initiative of the Health Sciences Center in Baton Rouge was housing due to the doubling of the population of the city as a result of the evacuation of New Orleans. We addressed this by providing a FinnJet ferry boat docked on the Mississippi River for housing up to ~1000 students, faculty and staff. An additional 400 one and two bedroom trailers are placed on LSU property in Baton Rouge as part of an University Village for faculty and students.

At the departmental level, the business manager Karen Jorgenson was working from day one Post-Katrina to support the efforts. Additional staff and grants administrators soon came on board and provided a support base for faculty. We communicated with all faculty immediately after the storm through text message as direct phone calls were problematic. The LSUHSC email system was down for two weeks further complicating communications. Through text messaging, limited phone connections and alternative email accounts we were able to establish contact. The priority was personal safety and support. As expected, individuals evacuated to different areas of the country to find a personal comfort zone for their families.

We are pleased and thankful to report that among all faculty and staff (~100 people) in the Department - there was no loss of life. All faculty and staff suffered personal loss and damage to homes to varying degrees. Three faculty completely lost their homes with at least five others having severe water damage. At least four staff also suffered severe personal loss and damage.
Our mission during this time was to provide a personal and professional anchor for individuals and we held conference calls with the faculty and also with students to bring people together.

**Our next step was to provide a mechanism for continuity of research programs and pharmacology courses as individuals tackled the issues in front of them.**

With an initial anticipated time frame of 3-9 months following Hurricane Katrina for a fully operational campus at LSUHSC in New Orleans, we moved aggressively to make sure that investigators have what they need in terms of space, equipment and resources.

Due to the importance of finding a personal comfort zone, we decided to either support faculty in Baton Rouge with lab space or to work with other universities where faculty may have found that comfort zone for the family and their specific situation.

In many cases, individual faculty gravitated toward the labs of established collaborators. Six pharmacology faculty set up operational space at LSU affiliated schools or centers in Baton Rouge (Pennington Biomedical Research Center, LSU School of Veterinary Medicine, LSU School of Life Sciences) whereas others set up their laboratory at other institutions (one in Department of Pharmacology at UT-San Antonio; two in the Department of Physiology and Cardiovascular Center at the University of Iowa; one at University of Virginia Cancer Center; one at Purdue University).

In mid-November, we also set up laboratories at Children’s Research Institute at Children’s Hospital (three faculty) and the Division of Cardiovascular Research at Ochsner Clinic Foundation in New Orleans (one faculty) as many faculty and staff began to return home to New Orleans.

Operationality was achieved by a combination of sharing equipment, buying small equipment used on a daily basis, by obtaining additional items from individual laboratories at the Health Sciences Center and the graciousness of the individual institutions housing the investigators.

Graduate students beyond the first year of the program are with their mentors or collaborators as are fellows. First year students began classes in the interdisciplinary course framework of the School of Graduate Studies on Monday September 26th in Baton Rouge and these classes will be held in New Orleans beginning January 2006.

We established mechanisms to support funded research programs. We got our financial systems operative and a research supply store set up at Pennington Biomedical Research Center. In addition, we provided each investigator with a
“purchasing card” so that they could buy what they needed immediately. For investigators at different universities, we covered all personnel and supply costs through LSUHSC as normal and we arranged for direct shipping of supplies and reagents to the investigator’s laboratory.

The start up of the research programs of some investigators was delayed by personal issues or specific needs for their research program. However, 90% of the faculty have their research programs up and running through these mechanisms. Although operational and functioning, one can imagine that it is a struggle for investigators and many situations are suboptimal. All faculty will be operational in by January 2006.

Additional challenges were presented by the logistics of initiating pharmacology courses for LSUHSC students in the Schools of Nursing, Dentistry, Medicine and Allied Health along with the interdisciplinary graduate program within the School of Graduate Studies. Drs. Dennis Paul and Rhoda Reddix in our department tackled these issues and were soon joined by Drs. Songu-Mize, Winsauer, Varner and Kirkendol. These individuals have done an outstanding job of keeping these programs on track.

On a personal note, we have been contacted by multiple institutions, colleagues and Departments of Pharmacology around the country offering space, support and encouragement. I have never been so touched as when I read these notes and think of all of the outpouring from the research community. Ken Harden (Department of Pharmacology – University of North Carolina School of Medicine), K. U. Malik (Department of Pharmacology – University of Tennessee Center for Health Sciences) and Tom Michel (Harvard University School of Medicine) were among the first to contact me and I quickly received over 500 inquiries and offers of assistance from colleagues in the field. Steve Sprang found me when I was answering phones in the LSU systems office a few days after the storm as we set things up in BR. I will never forget this concern. All of the investigators in the department have similar stories.

The numerous and generous offers of lab space and support from the research community has provided flexibility to address this challenge. All of the individual programs, investigators and institutions that welcomed displaced investigators should be recognized for their tremendous effort, graciousness, support and hospitality.

Drs. Thomas Gettys, Donna Ryan and Claude Bouchard at (Pennington Biomedical Research Center) mobilized their support group for the Department and their efforts are greatly appreciated. Similarly, Dr. Gary Wise (Head of Comparative Biology) and Dr. Joseph Francis at the LSU Veterinary School along with their staff were also of huge assistance as they accommodated some of our faculty. Dr. Seth Pincus and the group at Children’s Hospital Research Institute
have also been tremendous in opening their arms to accommodate both Pharmacology and investigators from multiple departments.

Thanks to the generosity and spirit of Dr. Carmen Dessauer and colleagues (Drs. Davies and Weisbrodt) at UT- Houston, two of our faculty were set up in the Department of Pharmacology early on but personal issues required them to come back to the NOLA- BR corridor.

Drs. Michael Weber, Tom Parsons and Geoffrey Weiss were instrumental in the accommodation of Dr. Andrew Catling in the Department of Microbiology and Cancer Center at the University of Virginia School of Medicine.

Drs. Robin Davisson (Department of Anatomy and Cell Biology) and Ulla Kopp (Department of Internal Medicine, VA Medical Center) welcomed Drs. Kapusta and Lazartigue to their laboratories at the University of Iowa School of Medicine.

At the Ochsner Clinic Foundation in New Orleans, Drs. Corey Goldman, Alberto Martinez, Cooper Woods and Chris White all worked to accommodate Dr. Hamid Boulares.

Charles Nichols began operating his laboratory at Purdue University as a Visiting Scholar with the support of Drs. Donald Ready (Biology Department), Val Watts and Rick Borch (Department of Medicinal Chemistry and Molecular Pharmacology).
STRATEGY FOR BUILDING ANEW

The disruption in the program due to Hurricane Katrina is hard to fathom as it impacts so many aspects of our personal and professional lives. Every person’s life has been turned upside down and every week there seems to be a shift in the perceived “zone of stability”. However, the plans are coming together and individuals are finding their niche.

We are optimistic that there will be an unusual and unexpected burst of creativity emerge from this disruption and we are fully committed to nurturing it with all of the resources that we have at our disposal.

There are of course many challenges for the research and education programs.

One of the major challenges is the repair and cleaning of buildings on campus so that reoccupation occurs as quickly as possible with appropriate support services for the programs. Another major challenge will be retention of the talented faculty we recruited over the past five years. The third is program continuity during this 8 month transition period. The fourth is to identify the financial resources and required infrastructure to build anew. The fifth is a challenge to us to create fresh ideas and not simply recreate what we had achieved before.

All of these issues are further complicated by the financial strain on the State of Louisiana and the City of New Orleans, which has resulted in furloughs, budget cuts and frozen assets as go through the remainder of this fiscal year.

Over the last two months, we have reviewed each aspect of our program, collected information from investigators in regards to losses and moved forward to meet our Post-Katrina objectives for building anew and program expansion.

Our goal is to retain our foundation and build anew. This requires an investment in people, infrastructure and programs and building upon the opportunities created by partnerships developed post Katrina. These issues are addressed at multiple levels. We now have a preliminary damage assessment from individual faculty in the department and formulated a rough draft of an approach to rebuild.

Sources for financial resources include the National Institutes of Health, National Science Foundation, private foundations, professional organizations (i.e. ASPET, ASBMB, APS etc), American Heart Association, private donors and corporate donors. ASPET, ASPET council members and APS have graciously provided funds to students and/or fellows. Portola Pharmaceuticals and Astellas Pharmaceutical Company also made generous donations to the Department of Pharmacology for its recovery effort and we are greatly appreciative.
NIH has a central office working on these issues and we anticipate a visit from a group representing NIH, NSF and the President’s Office of Science and Technology in January.

Shortly after the storm, we put in place a draft overall strategy for building anew. The following thoughts provide a template for discussion on defining the best path. Some of these points have been addressed while others remain part of an ongoing discussion as we adapt to an everchanging situation.

1) Faculty support and continuity of research programs

- Provide a source of monies to assist faculty with personal losses
- Increase salary for faculty and staff by 10%
- Provide 12 month funded extensions of NIH and foundation supported research programs impacted by Hurricane Katrina
- Implement a mechanism to make funded investigators eligible for special “Career Development Awards” that would cover salary for up to five year
- Provide a type of NIH-MERIT award for qualified, established investigators
- Enhancement of start-up packages committed to faculty recruited within the last two years

2) Research Reagents and tools

- Provide one-time administrative supplements for individual investigators funded by NIH for replacement of reagents and small equipment directly involved with the funded project and to cover costs for temporary laboratory operation.
- Additional losses to research programs not specifically related to the NIH funded research project may be recovered through other governmental programs.
- Provide reduced cost access to any services (i.e. transgenic, knockout, protein analysis, peptide synthesis, antibody generation) provided by entity receiving NIH support or contract.
- Request individual companies (i.e. Charles River, Invitrogen, Bio-Rad, Sigma Aldrich) to provide price reduction for a defined period of time.

3) Research Training

- Provide a source of monies to assist students and fellows with personal losses
- Provide institutional pre and postdoctoral training grants to established programs

4) Equipment

- Full replacement of damaged equipment
- Provision of immediate access funds for department to purchase small equipment items to allow funded research programs to become immediately operational during this transition period
- Provide an additional one time application mechanism for shared instrumentation awards through the NCRR for funded investigators in the region

5) Research space development and mitigation - Provide infrastructure mitigation and organization that would prevent the damage to LSUHSC from repeating with the next storm.

- Streamline applications for C6 type space development grants through NCRR
- Fast-track plans on new research building for faculty retention and recruitment
- Triple the monies committed to space renovation through COBRE – type grants supported by NCRR
- Fast track construction of animal care facilities through NCRR

6) Programmatic development

- Develop a GLUE Grant, PPG or COBRE type mechanism to support the further inter-institutional development of the programs in areas of strength and need (i.e. Integrative Pharmacological Sciences, Environmental Sciences, Cancer, Cardiovascular Biology).
- Exclude NIH-funded research programs at effected institutions from any anticipated budget cuts on new grants and noncompeting renewals for the next three years.

THE FUTURE

The research community, the City of New Orleans and the State of Louisiana face tremendous challenges as we build for the future. I think it is of utmost importance that we springboard from this event to recreate a new and better environment and that we do not simply return to business as usual.

One of the lasting components of this rebuilding will be taking steps to put in place even more extensive plans as to how institutions and individual departments prepare for such a catastrophe should it occur again. While many components of the preparedness worked, many did not and we will continue to learn from these events. Within the Department, we will be revisiting all of these issues over the next few months. These issues include how individual investigators have organized their own laboratory in terms of facilitating the recovery of perishable materials, storage of perishable materials, communication mechanisms and a complete, up-to-date knowledge of the type, amount and location of chemicals, drugs and equipment. At the Departmental level, communication is crucial and one must always have in hand multiple mechanisms for contacting staff, faculty and students (i.e. alternative phone numbers and emails). We have also learned what it takes to support investigator’s programs during periods of transition after such events. Once
we catch our breath, we plan to provide a more detailed analysis of steps that all departments may take to increase their preparedness for such unexpected events.

Overall, the key to dealing with such an event relies on the strength of the human spirit and the ability of people and strong leadership to work together as a team and tackle the issues that invariably appear during and after such events. There are a lot of heroes involved with these stories including events large and small. We know a few of these, but many more are out there and many more will surface as the challenges are tackled over the next few months and years.