

**Strategic Plan for Research Enhancement at the UNTHSC
2005 to 2010**

**By
The Strategic Planning Committee of the Research Advisory
Council (RAC)**

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1. Executive Summary

Over the past several years, research has grown more rapidly than any other division of UNTHSC. Awards for research grants have grown from less than \$10M in fiscal year 1999-2000, to greater than \$22M in fiscal year 2003-2004. Key to this growth was recruitment to UNTHSC of several renowned scientists and their research programs. Additionally, UNTHSC benefited from the doubling of the NIH budget that corresponded with our growth. For several reasons, continued growth cannot be realized without renewed commitment to research, and we are thus at a critical time in our institutional development. Decisions made at this point and in the near future regarding investment in research infrastructure will determine whether UNTHSC's research enterprise will continue to grow, or whether it will stagnate. A strategic plan for research enhancement is proposed by the Research Advisory Council for 2005-2010 that focuses on a variety of factors internal to the UNTHSC. We propose more than a dozen new initiatives that will stimulate research. Among the areas considered absolutely critical for continued research growth are:

- 1) **Finish-out of the Center for BioHealth (CBH):** UNTHSC is currently operating at capacity with regard to research laboratories. If a number of large proposals currently in preparation and/or under review are funded, we will not be able to provide adequate space to support those programs. Moreover, the lack of research labs greatly hinders our ability to recruit new faculty with well-funded research programs. It is thus absolutely critical that floors 2, 4 and 6 of CBH be completed as soon as possible. Without this or comparable new research space, we simply will not be able to maintain continued development of research.
- 2) **Strategic hires:** UNTHSC's faculty is its most critical resource in advancing research. In addition, because of the size of UNTHSC, we must focus our research investment in areas in which we are particularly strong. Finally, as outlined by the NIH roadmap, collaborative, multidisciplinary research is and will continue to be an area of emphasis at NIH. Without the capability to submit strong multidisciplinary proposals, UNTHSC will not continue to be competitive with other health science centers in attracting large multi-million dollar awards. It is thus imperative that resources be committed to recruit leading basic and clinical scientists and public health professionals who have research programs complimentary to our identified focus areas.
- 3) **Faculty retention:** In addition to the need to bring new faculty to UNTHSC, it is also critical to retain our productive and talented faculty. Because of the cost-effectiveness of retaining key faculty, UNTHSC must implement steps to ensure its highly sought after top researchers remain at UNTHSC. An initial positive step in this effort has been the implementation of the Faculty Incentive Pay Program. Additional steps to reward and recognize our most productive faculty should be implemented.
- 4) **Improved start-up packages for new hires:** In recent years, total dollar commitments (start-up packages) to new hires has increased several fold at institutions with which UNTHSC competes. For example, start-up costs for a young basic scientist coming straight from a postdoctoral fellowship are now typically in the 400-500K range. To recruit a mid- or senior-level scientist with an established research program generally requires an even more substantial investment. UNTHSC has been extremely fortunate to recruit the top scientists it has recruited in recent years. However, because the UNTHSC start-up package has not grown at a rate comparable to those of our peers, we are

increasingly at a competitive disadvantage with regard to recruiting top scientists. UNTHSC must improve the competitiveness of its start-up packages so that we can continue to recruit top research talent.

- 5) **Instrumentation:** With the advances in the capabilities of scientific instrumentation, equipment in many areas of research becomes dated and obsolete within a few years. To stay competitive, upgrading of instrumentation is a necessity. Although UNTHSC has recently invested in some high-tech instrumentation, there has been no concerted plan to provide funds for purchase of new equipment. To remain competitive in rapidly moving fields that are instrumentation-intensive, UNTHSC must provide a reliable funding source for planned upgrading of equipment.

These are a few critical areas that must be addressed if UNTHSC research dollars are to continue to grow. This Strategic Plan provides analysis to substantiate that dollars invested in research are returned to UNTHSC more than 4-fold (Section 4, pg. 7). Thus, if major aspects of this plan are implemented, it is feasible to speculate that by 2010 UNTHSC will have an annual research budget approaching \$50M. In contrast, with no further investment in the research enterprise, UNTHSC’s extramural research awards will remain flat through 2010 (Figure 1).

Although the dollar values proposed herein may be considered substantial, it should be noted that many of these funds can be committed from current sources (e.g., F &A generated from existing awards). Other sources to fund these requests may include the annual Green Book request, private donors, shared instrumentation proposals, etc. Additionally, we cannot overemphasize the fact that in the medium to long term, the cost of no additional investment in research will far exceed the cost of new investment. The Research Advisory Council fully believes that the proposed Strategic Plan will not only enhance overall resources for UNTHSC, but will result in the UNTHSC becoming the best small health science center in the nation.

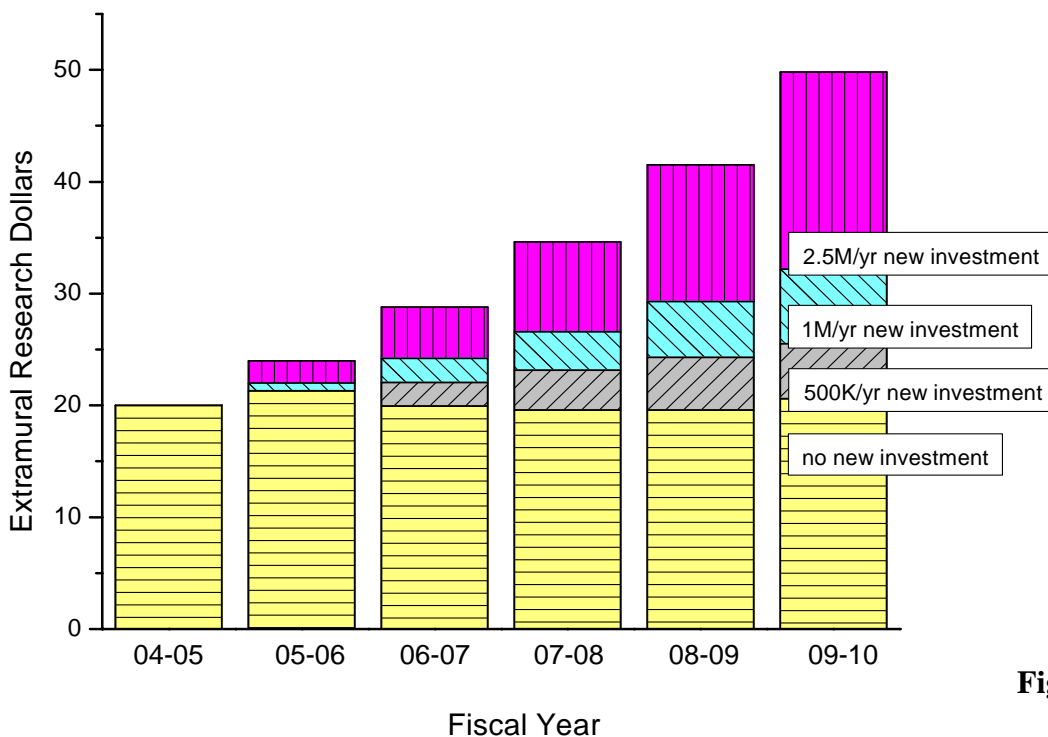


Figure 1

2. Introduction

We are at a critical point in our research development, driven by a number of factors both internal and external to this institution. The University of North Texas Health Science Center (UNTHSC) has experienced unprecedented growth in its research productivity in the last decade and is now poised to grow robustly and become one of the nation's best small health science centers. The circumstances internal to the UNTHSC that will determine the fate of research growth are the subject of this strategic plan.

The Strategic Planning Committee of the Research Advisory Council (RAC) was charged with

- identification of institutional needs for research enhancement
- making recommendations that would create an optimal institutional research environment for all faculty
- making recommendations critical to the development of an outstanding research institution
- evaluation of factors that impede the progress of research at UNTHSC

The Strategic Planning Committee chose to develop a 5-year plan because projections of needs and activities beyond that period would be too speculative. Forces external to the institution, such as changes in state and federal funding levels, innovative technology development, and new scientific discoveries, would require substantial changes in the strategic plan. Effectiveness of the strategic plan over a longer term will be maximized by reviewing and revising the research strategic plan every three years.

The Strategic Planning Committee was created by Dr. Glenn Dillon, Acting Vice-President for Research with the endorsement of the Research Advisory Council. Work began in January 2005 and proceeded with data gathering, meetings and assessments. On May 25, 2005 the draft version of the report was presented to the RAC for consideration. After a number of additional modifications, the plan was approved by the Research Advisory Council on November 16, 2005.

The members of the Strategic Planning Committee of the RAC are as follows:

James W. Simpkins, Ph.D., Chair, Graduate School of Biomedical Sciences

Sejong Bae, Ph.D., School of Public Health

John Planz, Ph.D., Texas College of Osteopathic Medicine

Jerry Simecka, Ph.D., Graduate School of Biomedical Sciences

Peggy Smith-Barbaro, Ph.D., Texas College of Osteopathic Medicine

3. Research Progress in the Recent Past at the UNTHSC

Since becoming a health science center in 1993, research at UNTHSC has grown at the fastest rate of all the health science centers in Texas. Figure 2 shows the growth in annual research funding over the past decade. In fiscal year 03-04, funding exceeded \$21 million; this reflects a 21% increase over fiscal year 02-03. In the past 4 years, research funding has increased more than 125%. Roughly 75% of UNTHSC research is supported by federal sources, and the majority of this is from NIH. Over the past 4 years, NIH funding has more than tripled. Over the near-term, the growth in research at UNTHSC is expected to continue to increase as evidenced from the high level of research grant applications (about \$100 million in 2004).

However, this rate of growth can not be sustained, due to faculty, space, and equipment limitations and organizational issues. To sustain our impressive rate of growth and to emerge in the next 5 years as the nation's best small health science centers, numerous changes in our approach to research need to be implemented. These recommended changes are enumerated in the following sections.

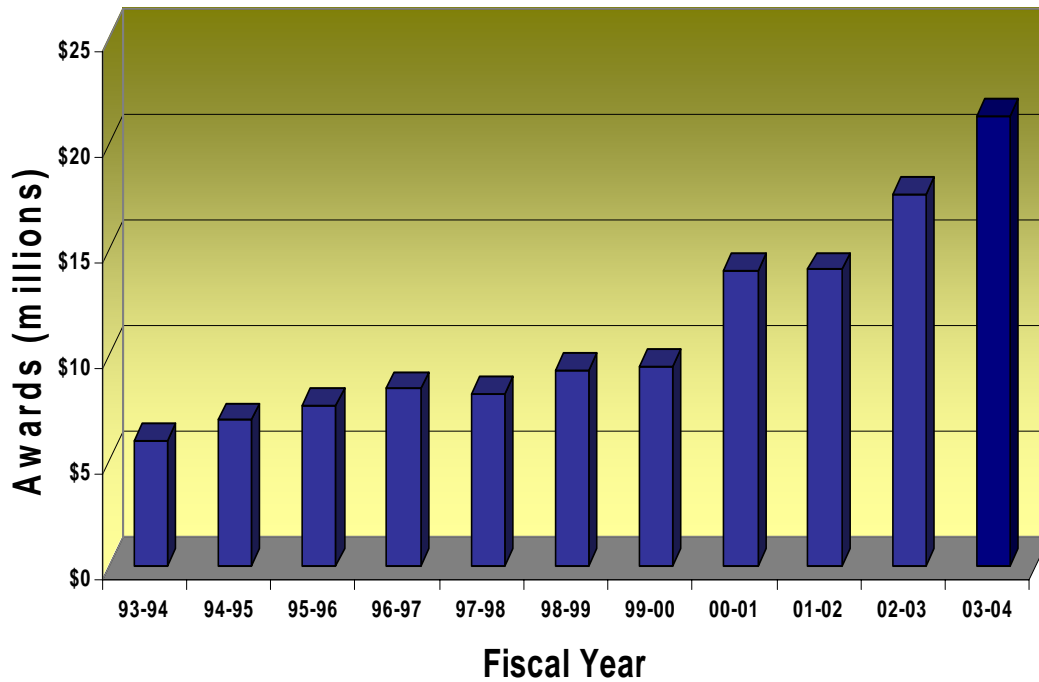


Figure 2

4. Return on Investment in Research

The proposed recommendations should not be viewed as merely a method to enhance research capability here at UNTHSC. Instead, the evidence is strong that investment in research results in benefit to the entire institution. Indeed, expenditures directed toward research may be the only area where several-fold returns on each dollar spent can be consistently realized. Many examples of this can be seen even here at the Health Science Center. Two examples are presented here.

a. Investment return on faculty start-up packages. As one measure of return on investment in research, we calculated extramural awards received by faculty hired since 2000 who were given a traditional start-up package. “Investment” for each faculty member was calculated as: 1) the total value of his/her start-up package, and 2) any state-paid salary given during the period of extramural support. If no extramural support was present beyond FY05 (one case), then salary investment was extended through FY06 (exception: one faculty member left the institution during FY05). “Return” included only extramural grants awarded to the same group of faculty (i.e., any grant that was in whole or in part awarded using UNTHSC funds was not included as a return). Return dollars include both direct and indirect costs, and reflect grant out-years. The numbers follow:

<u>Investment</u>		<u>Return</u>	
Start-up packages	1.7M		
Total state salary	4.155M	extramural research awards	27.026M
Total	5.855M		27.026M

UNTHSC has invested approximately 6M since 2000 in start-up packages and salary, and this investment has resulted in greater than 27M in return. Those, **for every \$1 invested, UNTHSC has seen a return on investment of \$4.61.**

b. Investment return from intramural research awards. Because new faculty in Basic Science are typically the faculty that receive substantial start-up packages, the above analysis is not necessarily representative for the entire Health Science Center. Thus, for a more encompassing analysis, we have quantified the return on investment for intramural research awards. We looked at total intramural funds of state-derived origin invested since December 1999. This included traditional intramural grants, tobacco money grants, and grants in aging. Because the UTA-UNTHSC intramural funds were awarded only eight (8) months ago, these awards were not included in the analysis.

An extramural award subsequent to an intramural award was included as a “return” only if it fulfilled all of the following criteria: 1) same Principal Investigator as the intramural award; 2) same or similar title as the intramural award; and 3) start date of at least six (6) months after the start date of the intramural award. No DREAMS projects were included in the return analysis. In addition, we did not try to identify “second-order” awards (i.e., a subsequent extramural award garnered following the first extramural award). These criteria likely result in a conservative estimate of the return on each dollar spent. The numbers follow:

Investment

intramural research awards **1.256M**

Return

resulting extramural awards **5.651M**

Since December 1999, 72 intramural research awards have been awarded, at a total cost to UNTHSC of \$1,256,103. Those intramural awards have been converted into 23 extramural awards (32% conversion success) totaling \$5,651, 732. **Thus, for every \$1 invested in the intramural research program, UNTHSC has achieved a return on investment of \$4.50.**

These data demonstrate clearly that investing in research faculty and intramural research programs leads to new dollars coming into the institution. While many of these new dollars are to directly support a specific research project, the majority of these awards have with them associated indirect costs, which can be used to support many types of initiatives at UNTHSC. Thus, investing in research is a proven strategy to facilitate overall growth of the institution.

5. Institutional Research Mission

The backbone of a strong institutional research program is a clearly defined institutional research mission and a thorough evaluation of whether resource distribution is consistent with the stated mission.

Recommendations:

- The RAC should identify the research mission of UNTHSC and articulate this mission to all constituents. This research mission should specifically identify our areas of research strength and those areas where resources will be devoted to achieve national standing.
- New faculty hires should be focused in these areas of research strengths (see Section 8).
- Each academic or research unit (Department Chairs, Deans, Division Heads, Center/Institute Directors) in UNTHSC should be assigned annually by its chair (or director) a research goal that is reasonable and achievable. Annually, the RAC should review next year's goals and last years level of success. The RAC should recommend to the President changes in resources distribution based on the success of the unit in achieving its research goals.
- The RAC should assess resource distribution, including space, faculty, support personnel and direct investments of money at UNTHSC to insure that our resource distribution is consistent with our research mission.
- An institutional program designed to increase the visibility of UNTHSC research accomplishments, announcements of donations (no matter how small) and research awards needs to be developed and implemented on a local, state and national level

Action Achieved/In progress:

6. Laboratory and Research Office Space

Infrastructure needs currently limit research capacity at UNTHSC. Most of the current basic research laboratories were constructed in the 1970s and were built as generic research space appropriate for that time. New, modern laboratories specifically designed for a wide range of contemporary research are sorely needed.

It is important to note that newly constructed laboratory space should be available to faculty conducting active research irrespective of the school in which the faculty reside. With the proposed addition of 20 basic science and 15 clinical research and 15 research-based SPH faculty over 5 years (see Section 8) needing an estimated 1,000 sq. ft. per faculty, the University will be short 50,000 sq. ft. of laboratory space. An additional research facility is clearly needed to implement this strategic plan. This extent of hiring should be accomplished in part through joint hires among the schools. Consideration should also be given to consolidation of faculty with similar research interests into designated research areas (see Development of Centers/Institutes of Discovery, pg. 17).

Utilizing space in The Center for BioHealth (CBH) will only partially solve the space issue. Currently, only one floor is exclusively devoted to intense basic science research. In the next two years, one more floor is proposed for such activity, and another is proposed for core facilities.. With the “finish out” of this structure, only one half of the building will be devoted to modern intense research activity.

Recommendations:

- RAC should develop a plan for the remodeling of all “non-renovated” laboratories in EAD and RES in the next 5 years. The emphasis should be on increasing efficiency of space, which could postpone the need for new building and reduce cost. HEAF funds or other resources should be dedicated to such renovations
- 2005: The Master Plan should include a new research building which would be requested in 2007.
- 2005-06: Include as part of the CBH 6th floor completion a plan for a BSL-3 facility leveraged against faculty recruitment and biodefense grant submission.
- 2005-07: Complete construction of floors 4 and 6 as proposed in the NIH facilities grant application.
- 2006-07: Convert office space on CBH floor three to basic research laboratories and create new contemporary office space in EAD or RES including a consolidated space for SPH faculty. Upon completion of the proposed Public Health and Education building, essentially all SPH faculty should be housed there.
- Research Support Services (Office of Grant and Contract Management, Institutional Review Board staff, Clinical Trials, Technology Development and Commercialization) should be located in a single area

Action Achieved/In progress:**Office Space**

Office space is becoming an issue in RES and EAD. This is needed for new faculty, as well as space designated for graduate students, post-doctoral trainees and research tract faculty to work on manuscripts and analyze data. As we expand our faculty, the idea of centralized office suite has become somewhat unworkable. It is more efficient for office space being located near the researchers' laboratories. In addition, valuable laboratory space is current being used as "office" space by graduate students, post-doctoral trainees, and research faculty.

Recommendations:

- Office areas need to be identified that can be used by 3-4 graduate students and/or post-doctoral students. Wherever possible (e.g., laboratories of CBH), office areas for students should be located in laboratories. Similar space for 1-2 research faculty needs to be designated.
- Office space for new faculty, preferably near laboratories, needs to be identified.
- Consolidation of administrative offices should be considered.

Action Achieved/In Progress:

7. Strategic Hires

UNTHSC's faculty is the most critical resource in the institutions efforts to conduct cutting edge research into the causes, prevention and treatment of a variety of diseases and metabolic states.

Although the faculty of the GSBS, ranks 11th nationally in productivity per faculty member, the number of GSBS faculty FTEs has decreased from 55 to 45. Similarly, UNTHSC's full-time clinical faculty and SPH faculty who are capable of developing a research program and full time faculty in SPH have not increased in the last decade. *There is a clear and pressing need to substantially increase the faculty size in both basic and clinical research departments.*

Recommendations:

- Increase in faculty of 10% per year in all schools. Particular focus should be given to research faculty using interdisciplinary approaches. This should translate roughly to the following:
 - Increase by 3 per year for the next 5 years the number of SPH research faculty.
 - Increase by 3 per year for the next 5 years the number of TCOM research faculty.
 - Increase by 5 per year for the next 5 years the number of GSBS research faculty.
 - Increase by 2 per year for the next 5 years the number of SHP research faculty.
- The increase in faculty numbers should be in defined research areas consistent with UNTHSC's research needs and research mission. Cutting-edge research can only be successful if specific areas relating to UNTHSC's research mission are fully exploited to achieve national standing in these areas.
- The Strategic Planning Committee recommends that strategic hires be made in three potentially collaborative research areas at UNTHSC as determined by RAC.
- Recruitment of joint hires between the major schools and departments with clear policies to define the responsibilities of each of the schools or departments. need to be a priority

Action Achieved/In Progress:

8. Scientific Instrumentation

To remain competitive in the research arena an updated equipment infrastructure is vital. With the rapid pace of innovation in scientific instrumentation, equipment becomes outdated in just a few years. Failure to keep pace with instrument replacement will rapidly lead to UNTHSC's loss of national competitiveness in many research fields and result in a loss of income from federal grants.

Historically HEAF funds at UNTHSC were used for updating needed equipment. Unfortunately, in more recent years, HEAF funds have been used in this manner only sporadically. The lack of a well formulated plan for the purchase of essential equipment will leave UNTHSC perpetually behind research competitors from other universities in fields such as but not exclusive to modern molecular biology, genetics and quantitative cellular imaging

Recommendations:

- RAC should conduct an annual equipment needs assessment, working with the chairs and directors.
- The RAC should take on the following tasks: 1) formulating overall instrumentation needs of the institution; 2) insuring that funding sources are identified; and 3) orchestrating submission of shared instrumentation grants at least yearly, and preferably for each NSF and NIH deadline. Matching funds should be identified to support such initiatives.
- Annual institutional expenditure on research instrumentation upgrades should be about 10% of the annual total research income of the institution (currently approximately \$2M). Adopting this linkage between research income and institutional equipment purchases would insure the continuous updating of scientific equipment meets the growing needs of our research enterprise. These expenditures should be made by the Vice-President for Research at the recommendation of the RAC.
- Core grant applications should be submitted regularly by groups of researchers in their specific areas of research.
- There should be consolidation of expensive and specialized equipment into cores. This should increase the efficiency of instrument dollars by minimizing redundant equipment and increased oversight and maintenance.
- Indirect cost should be used to maintain core equipment, allowing any user fees to be kept at a minimum. The cores should encourage new research directions/approaches and facilitate funded research.

Action Achieved/In Progress:

9. Institutional Support of Research

Institutional Funding for Multidisciplinary Research Programs

The success of current research faculty to secure two program projects and one U29 project demonstrates that strength of our faculty's expertise, knowledge and national reputations to complete for large research programs. The success of these efforts can be significantly improved by UNTHSC investing in the development of multidisciplinary research programs, that hold the promise of rapid payoff through an increase in the national reputation of our faculty as well as through the IDCs returned to the institution from these "big ticket" items. Supporting multidisciplinary research programs by the institution is an essential part of any research enhancement plan.

Recommendations:

- Annually, \$100,000 should be set aside to stimulate multidisciplinary team development.
- Development of multidisciplinary teams should be through an internal competition.
- Moneys should be used for such things as hiring of support staff to develop grant application, seed research project vital to the team, purchase vital pieces of equipment need for the multidisciplinary activity.

Action Achieved/In Progress:

Start up packages for new faculty

Start up packages for new faculty are far too low. For the last 5 years UNTHSC provided \$150,000 for equipment to new Basic Science faculty and recently increased this amount to \$200,000 spread over two years. This level of investment in new faculty is not competitive with other institutions and has resulted in the loss of many potential recruits in the recent past.

Recommendations:

- Increase start up packages so that they are competitive with other institutions. Encourage Deans and Chairs to also emphasize other components of the start-up package, e.g., committed graduate stipend, salary for technician, etc.

Action Achieved/In Progress:

Retention of faculty

It is much more expensive to hire new faculty than to retain productive faculty. Retention is also important to maintain research momentum. The loss of key faculty can disrupt research teams and collaboration, and reduce role models for success in research. A successful model has already been developed in the GSBS Incentive Pay Program.

Recommendations:

- Develop an institutional policy designed to maximize UNTHSC's research faculty retention rates by rewarding faculty for their research efforts and resolving concerns of research faculty in a timely fashion.
- Each school should adopt the GSBS bonus plan that supports retention of critical faculty, while keeping within federal guidelines.

Action Achieved/In Progress:

- UNTHSC recently instituted an F and A costs return policy.
- GSBS has established an effective and incentivizing bonus plan.

Seed Grants for new faculty

Historical analysis has shown that funds invested in a seed grant program deliver a roughly 4-fold gain back to the institution. Seed grant money provided by the institution should be allocated to provide institutional support to new faculty for their budding research programs and more seasoned faculty, initiating a new more contemporary direction in their research.

Recommendations:

- Reinitiate an Annual Faculty Research Grant Program to address the research support needs of new faculty and established faculty with changing research directions.

Action Achieved/In Progress:

- The Annual Faculty Research Grant Program has been re-initiated, with \$100,000 to be distributed in the competition; funds will be available in January 2006.

Internal Grant Review Committee

The RAC and the GSBS jointly proposed and initiated a policy change that requires new faculty and faculty who have been in funding hiatus for two or more years to submit their grant application to an Internal Grant Review Committee prior to their submission to the funding agency. The Strategic Planning Committee endorses this policy for several reasons. First, many institutions now require internal review of all grant application that are submitted to funding agencies. This activity will be instructive to new faculty, since the Internal Grant Review Committee will be composed of highly successful researchers, any of whom actively serve on NIH or other review committees. Finally, faculty who have funding lapses are likely in need of a pre-review of their grants to identify problems and to propose solutions before submission of the application.

Recommendations:

- The RAC should support the Internal Grant Review Committee and facilitate its activities.

Action Achieved/In Progress:

- The Assoc VP of Research has identified and named a Grant Peer Reader committee, with members from all schools. The committee has constructed and distributed to all Deans guidelines and procedure for the program, with the goal of conducting pre-submission review of grant applications on a voluntary basis.

10. Strategic Pursuit of State and Federal Initiatives

In addition to pursuing traditional research funding sources such as grants and sponsored projects, UNTHSC must aggressively and strategically pursue less conventional sources to help fund research activities. For instance, although Texas has lagged behind national trends with regard to funding biotechnology initiatives, the state is beginning to recognize the importance of funds devoted to attracting and developing biotechnology. House Bill 1765, the Governor's Emerging Technology Fund, was recently passed in the Texas legislature with strong bipartisan support. This fund will devote up to 300M for the funding of developing technologies in several targeted areas, including bio- and nanotechnology. The majority of these monies will likely be directed to the large, well-established research institutions. To achieve any success in receiving funds from this or related initiatives, UNTHSC must consider all avenues to best position itself to be competitive. These may include partnering with other institutions, identifying niche areas that may not be pursued by larger institutions, etc.

Additionally, UNTHSC is beginning to have some success in attracting federal earmarks to support specific research activities. This is an important and much needed breakthrough for the institution. However, to enhance the likelihood of attracting funds that are likely to spawn successful long-term projects, UNTHSC should devote more planning to its Request for Federal Funds (i.e., the Greenbook).

Recommendations:

- The RAC should be charged with following development of potential new state and federal research initiatives, and to provide initial strategies by which they might be pursued. RAC, in conjunction with administration, would prioritize projects and proposals to be submitted annually as part of our annual Request for Federal Funds.

Action Achieved/In Progress:

- UNTHSC, in conjunction with UT-Southwestern, BioDFW and other local institutions, has developed and submitted a proposal entitled "North Texas Bio and Nanotechnology Discovery and Development Alliance".

11. Increase Collaborative Ventures with Local Institutions

Expectations at the national level for multidimensional approaches to solving complex biological and biomedical problems are projected to increase. UNTHSC's research capabilities can be expanded by partnering with local institutions which have expertise in areas distinct from our own. UNTHSC should actively pursue opportunities to form collaborative relationships that merge institutional expertise. Some examples of areas that, when merged with our research strengths, can enhance our likelihood for continued research growth include engineering, computer science, molecular modeling, bioinformatics, chemistry, nanotechnology, social work and nursing.

Recommendations:

- The metroplex has many institutions which have strength in the areas noted above. UNTHSC should explore potential collaborative research partnerships with both academic and industrial institutions and devise a strategy to implement these partnerships.

Action Achieved/In Progress:

- UNTHSC has begun a joint seed grant program with UT-Arlington, with the expectation that this will result in new submissions of novel research proposals to federal agencies. The Research Office will track the success of this joint program. UNTHSC is planning to explore possibilities for a similar collaborative program with UNT. Additional partnerships with other local institutions should be considered.
- UTA is constructing a searchable database of researchers and research tools/areas, and we are assisting in that development. UNTHSC has UTA research faculty bios, and we have sent bios of UNTHSC faculty to UTA.
- UNTHSC is leading a collaborative initiative to seek NIH funding for establishment of a North Central Texas Neuroscience Center Core. This initiative, part of the NIH Neuroscience Blueprint, involves as our partners the University of Texas at Dallas, the University of North Texas, and Southern Methodist University. The \$9M dollar proposal is to be submitted January 19, 2006.
- UNTHSC is also partnering with the University of Texas-Southwestern Medical Center at Dallas and the University of Texas at Dallas on federal initiatives in advanced technology and establishment of a Center on Obesity and Metabolism.

12. Development of Centers/Institutes for Discovery

The Institutes for Discovery provide a viable mechanism for the University to house large collaborative research ventures at UNTHSC. If properly developed, revamped Institutes of Discovery provide an excellent mechanism by which to enhance multidisciplinary research, consistent with the NIH director's "Roadmap". In order to maximize the effectiveness of the Institutes the current system would need to be largely re-vamped.

Recommendations:

- UNTHSC needs to define clear guidelines with regard to what constitutes a Center and what constitutes an Institute of Discovery.
- UNTHSC should revamp the Institutes of Discovery, by initially supporting the development of only one institute. The number of institutes supported could be expanded as the institutes become independent and mature.
- Support for an Institute would be determined through a competitive peer-review proposal process. A five year plan proposal would be submitted outlining development of the Institute, outcome measurements and plans for financial independence. Additionally proposal applications would describe specific research goals, plans for development of multidisciplinary and clinical research projects, seminars, community involvement (e.g. interactions with local, state, and national foundations such as American Cancer Society), increase the visibility of the institution, Each institute would be required to develop a 3-year plan to achieve specific research goals.
- Successful institutes would easily return these costs to the UNTHSC through new IDCs generated over this 3 year period. Indeed, a single new program project grant would generate per year, IDCs more than the annual costs of this program.
- Each year, the RAC should evaluate the progress of the institute to insure progression toward financial independence by the end of 3 years. Lack of progress would result in reduction or elimination of funding.
- Additional new Institutes for Discovery would be developed through an application process and the development of a 3-year plan as described above. The most expedient approach is to fund one institute for the first year at \$100,000, then reduce the funding of this institute in the second year to \$50,000 and to \$25,000 in the third year. During years 2 and 3, a second institute could be funding with the remaining money (up to a total institutional investment of \$100,000). The maximum financial outlay by the institution in any given year would be \$100,000. As existing institutes gain financial independence; new institutes can be phased into institutional funding. Also, these funds should not be used to pay faculty salaries.

Action Achieved/In Progress:

13. Student Research Training

In addition to their role in achieving our mission in graduate training, graduate students are the major labor force in our research endeavor. Indeed, the success of our research effort is directly correlated with the expansion and quality enhancement of our pre-doctoral training programs. In 1995, we had 77 graduate students. Our 4-fold increase in research funding was associated with a nearly 3-fold increase in our number of graduate students, with a current 206 graduate students enrolled. These two missions of the UNTHSC, training and research, are inexorably linked.

Given this linkage between pre-doctoral training and research success, it is imperative to enhance both of these training activities as part of our mission to enhance research productivity.

Recommendations:

- Increase institutional efforts to obtain training grants across departments and schools.
- Develop an institutional data base summarizing outcomes and demographics of past graduates trained in these grants. This information is vital in the development of future training grants.
- Develop a viable D.O. /PhD program that includes support for much of the training period.

Stipend Goals:

- 2005-06 – add 3.5 stipends (estimate per year cost of \$72,695)
- 2006-07 – add 3.5 stipends (estimate per year cost of \$145,390)
- 2007-08 – add 3.5 stipends (estimate per year cost of \$218,085)
- 2008-09 – add 3.5 stipends (estimate per year cost of \$290,780)
- 2009-10 – add 3.5 stipends (estimate per year cost of \$363,475)

This addition of stipends will have a total cost for 5 years of \$1,090,425 and at the end of 5 years an annual cost of \$363,475. This is a small effort that would increase by 50% the number graduate students engaged in advancing the research mission of the UNTHSC.

Action Achieved/In Progress:

14. Animal Facilities

The current UNTHSC Animal Facility is registered with the United States Department of Agriculture (USDA), and is a member in good standing with the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC) USDA and AAALAC personnel periodically inspect both the facility and the program. The Facility is designed for small animals (mice, rats, guinea pigs, rabbit and aquatic species) canines, swine and small ruminants (sheep, goat) and consists of 20,000 square feet that includes 47 animal housing rooms for rodents, rabbits, canines, swine and sheep. 8,500 square feet encompasses a barrier hall that includes a four room suite for biohazard containment. There are quarantine, isolation, and surgical rooms and suites. The facility also contains two procedure rooms, labs, three full shower facilities, a dirty/clean cage wash area, clean cage storage room, four offices, storage rooms, a walk-in freezer and food cooler, a radiology room and an animal receiving room. At capacity the facility can house 4000 mice, 900 rats, 48 Guinea pigs, 52 rabbits, 50 canines, 12 cats, 4 swine or 4 sheep/goats and 20 frogs. At present, 100 active protocols have been reviewed and approved by the IACUC. The current census is 2,309 mice, 847 rats, 6 guinea pigs, 21 rabbits, 23 canines and 11 frogs. In brief, we currently have a fully functional animal facility at the UNTHSC.

A satellite animal facility is proposed for the CBH. The CBH animal facility will be located on the 6th floor and consist of 930 sq. ft. of housing for rodents, and related cage washing and sterilization activities and equipment. This facility will handle the rodent needs of occupants of the CBH and is part of a facilities grant submitted to the NIH on December 15, 2004.

Absent is a transgenic facility at the UNTHSC. The future of animal investigation is in the use of transgenic animals and the absence of a facility here represents a major omission in our research infrastructure.

Recommendations:

- Submit a facility grant to construct a transgenic mouse facility as an addition to the existing animal facility located in RES. This facility should be equipped with instruments needed to insert genes into oocytes, implant these oocytes into pregnant mice and derive the desired genetically modified animals.
- Hire a transgenic specialist who can develop needed new transgenic animals for UNTHSC investigators.
- Reduce animal per diem cost through greater investment of indirect costs, e.g. an increased portion of F & A.

Action Achieved/In Progress:

- 2005: A satellite animal facility for the CBH was included in a Facilities Enhancement grant application, but this will not be funded.

- In June 2005, UNTHSC submitted an Animal Facility Improvement proposal. This proposal, if funded, will significantly expand small animal capacity, improve housing of infected animals, and provide funds for a Transgenic Animal Facility.

15. Clinical Research Initiatives

To emerge as a leading health science center, an active clinical research program is crucial. Three focus areas in which all three schools of the Health Science Center actively participate in a collaborative effort to provide bench-top to bedside service have been identified. These current efforts include the Osteopathic Research Center (ORC), the Diabetes Research, Education And Metabolic Studies (DREAMS) program and the Maintaining Independence, Neutralizing Dementia (MIND) program. Within the first three years of funding the ORC has generated \$5.2 million for Osteopathic Manipulative Medicine (OMM) research and research training including the first large-scale multi-center OMM study being conducted at five osteopathic sites around the country to evaluate the benefit of osteopathic manipulative therapy in the treatment of patients hospitalized with pneumonia. The goals of the DREAMS program, which emphasizes the Hispanic population of Tarrant County, includes the establishment of a family-based primary prevention program to curtail the development of diabetes, obesity and metabolic syndrome, determine the prevalence of traditional and emerging risk factors of these health issues, and develop specific clinical intervention strategies for the treatment and prevention of both atherosclerosis and diabetes. MIND is a multi-disciplinary effort, which focuses on several aspects affecting the elderly, including strategies to maintain the health, independence and ethical care of the older adults. Major research focus emphasizes the early detection, treatment and prevention of Alzheimer's disease and dementia.

Two additional burgeoning areas of potential research excellence exist. The first involves continuing research efforts with the county, state, national and international Public Health departments in the treatment of both tuberculosis and HIV. This combined effort with the School of Public Health and the Tarrant County Public Health Department has a fifteen year track record of funding and is recognized internationally. The second area is in cardiovascular diseases in which there is a strong research base and the medical school is currently recruiting faculty to complement these efforts.

The current clinical drug trials program generates about \$400,000 per year. Expansion in this arena to provide logistics for "first-in-human" testing will tap into a greater potential for partnerships across the health services field and may allow the Health Science Center to realize potential affiliations with medical centers, such as John Peter Smith, and others. Clinically-oriented research activities in the area of Tick-borne disease have also been expanding and have provided recognition and collaboration at the state and national level. Facilities devoted exclusively to clinical research, however, are almost non-existent.

Although primarily of a service nature, state and national recognition has been brought to the Health Science Center for the activities and collaborations developed by the DNA Identity Laboratory in the areas of human identification. Significant funding from the National Institute of Justice and collaborations with the Federal Bureau of Investigation and other governmental bodies has allowed for the advancement of research in this area that is not available to any other health science centers.

Recommendations:

- Develop a university policy which supports clinical faculty release time for research endeavors.
- Allocate a portion of new hires to clinical research and recommend joint appointments between the GSBS and TCOM and SPH should be encouraged.
- Establish funding to create a Clinical Research Center (CRC) that has at least a dozen beds and is equipped with instrumentation and key personnel (i.e. nurses, dieticians and biostatisticians) to facilitate the day-to day research process.
- Develop a mechanism in which a portion of clinical revenues are directed to support novel/new research initiatives within the concentration areas outlined.
- Create a Phase I clinical trials center designed for “first-in-human” testing of drug candidates, developed by biotechnology companies, mid and large size pharmaceutical companies. If leveraged properly this activity could generate millions of dollars annually to support other research activities.

Action Achieved/In Progress:

16. Collaborative Research Interactions

According to the NIH roadmap collaborative research is the future of research funding. UNTHSC needs to strengthen its collaborative research ventures to remain competitive in the research funding arena.

Recommendations:

- RAC should create a quarterly seminar where examples of successful interdisciplinary interactions are described and discussed.
- RAC should encourage, through the two grant mechanisms described herein, funding of clinical-basic science interactions.
- Joint appointments between TCOM and GSBS, SPH and SHP should be encouraged.

Action Achieved/In Progress:

17. Institutional Advancement for Research

Successful academic institutions use their research and clinical accomplishments to raise money and deliver a large portion of the funds raised back to support innovative research activities, faculty hires and infrastructural improvements. UNTHSC can not achieve national standing in research without a highly successful institutional advancement program.

Recommendations:

- UNTHSC annual goals for overall and research-specific fund raising. should be negotiated and met by the Advancement Office
- A 5-year plan should be implemented to advance research funding through private giving, with the following goals. This money would directly support enhancement of our research effort and be dispersed by the Vice-President for Research with the advice of the RAC.

2005-06 - \$500,000
2006-07 - \$1,000,000
2007-08 - \$1,500,000
2008-09 - \$2,000,000
2009-10 - \$2,500,000

- An active program focusing on developing endowments should be developed and implemented. Interest from these endowments could be used to support research via seed grants, endowed professorships/chairmanships, etc. Tobacco funds should be considered as a source of funds to help build the endowments, in addition to private donations.

Action Achieved/In Progress:

18. Technology Transfer

In FY2004, a strong commitment was made to grow a technology transfer function at UNTHSC. For the first time, a tech transfer budget was established, a full-time director was hired, a dedicated administrative assistant was retained, and a partnership with Tech Fort Worth was formed. Collectively, these actions established the UNTHSC Office of Technology Development & Commercialization (OTDC). OTDC operates as a service unit in support of Research at UNTHSC. Its purpose is to work with Research faculty to identify, protect, and promote intellectual property developed at UNTHSC.

During its first year of operation, OTDC focused on developing an infrastructure to support its mission and moving forward, it will concentrate on using these assets to maximize the potential for intellectual property development at UNTHSC. Over the next five years, the biggest challenge will be managing the diversity of activities and responsibilities borne by the office, of which only a few are directly related to marketing specific technologies, identifying licensees and vetting spin-out opportunities. Already, the office struggles to balance these activities with others that come with its service unit role, including: management of material transfer agreements, nondisclosure agreements, and outside counsel contracts, negotiation and review of sponsored research agreements, involvement in faculty and student education, and contract accounting.

Strategically, OTDC will continue to operate as a service center for the research faculty at UNTHSC. While significant, the anticipated growth of research expenditures over the next five years will not justify additional manpower in OTDC. Hence, OTDC will plan to utilize student interns to assist with the marketing of technologies. To stimulate the development of intellectual property, OTDC will count on the institution to provide funds for protecting intellectual property and increase these funds to \$225,000 by 2010. Intellectual property revenue returned to OTDC will be used to support the further development of faculty inventions by establishing a “gap” funding program for projects with translational potential. Details on these strategic initiatives are provided below.

OPERATION AS A SERVICE UNIT

For discussion purposes, if all of the investments recommended by this Strategic Plan are implemented, it is assumed that the growth of research funding at UNTHSC will maintain its current rate and result in funding that reaches \$50 million by 2010. There is a direct link between the level of research funding at an institution and intellectual property development. As research funding grows at UNTHSC, so will the activities of OTDC. It will be important for OTDC to maintain a level of service that will fuel research growth and not impede it.

Although the generation of net positive revenue (profit center model) and regional jobs (economic development model) are potential long-term benefits of an established tech transfer office, these are not realistic expectations for a young program at an institution with research funding under \$100 million. Based on 2003 data for 33 universities with annual research expenditures ranging from \$28 million to \$78 million (average of \$50 million), the mean annual gross intellectual property income was about \$380,000. The median was about \$158,000. The significant difference between the mean and the median is the result of a few institutions

receiving a very high level of income. Average legal expenditures for the 33 institutions in 2003 were about \$225,000. Adding operational expenses to this cost, it becomes clear that most tech transfer offices at small institutions are not profit centers. These data suggest that OTDC should maintain its service focus and not expect to become a profit center for the institution within the next five years.

INTELLECTUAL PROPERTY REVENUE

As shown from the data presented above, within five years and assuming UNTHSC research funding grows to \$50 million by 2010, gross annual intellectual property income to the institution could grow to between \$150,000 and \$400,000. Per the current UNTHSC intellectual property policy, 50% of these funds would be distributed to inventors. Taking the best case (\$400,000), by 2010 annual intellectual property income distributed to the institution could be as much as \$200,000 with half of this distributed to inventors' laboratories and the other half (\$100,000) distributed to the OTDC intellectual property development fund. This scenario does not account for the recovery of legal expenses associated with the revenue-generating technology.

It is proposed in this Strategic Plan to use the OTDC net revenues to create a gap funding program that would provide funding awards to promising research programs for the purpose of generating critical data key to patenting or licensing a technology. For example, if a researcher made a pioneering discovery *in vitro* but lacked research funds to conduct valuable tests using an animal model, funds from the intellectual property development fund could be invested into the research program for this purpose. At least half of the annual OTDC intellectual property income would be set aside for this purpose. OTDC would invite applications for such funding on a quarterly basis. RAC would consult with OTDC to review proposals and make recommendations on awards.

FUNDING FOR THE PROTECTION OF INTELLECTUAL PROPERTIES

As research funding is expecting to rise to \$50 million by 2010, the concomitant rise in annual legal expenses by OTDC is expected to reach \$225,000 by 2010. Currently, the legal expense line item in the OTDC budget is funded at \$100,000 by F&A funds. It is proposed in this Strategic Plan that beginning in FY2007, additional F&A funds should be provided to OTDC each year through FY2010 for the purposes of financing the expected increase in legal expenses. It is proposed that \$25,000 be added in FY2007 and FY2008, that \$35,000 be added in FY2009, and that \$40,000 be added in FY2010.

WORKLOAD MANAGEMENT

It is proposed by this Strategic Plan that beginning in FY2006, OTDC will implement a licensing internship program. This program will place two business students (MBA or BBA) as interns in OTDC. The students will be charged with developing a marketing campaign for specific technologies and then conducting the campaign in an attempt to identify potential licensees. The initial program will be implemented with TCU. Application to the internship program will be competitive and small stipends will be provided from the OTDC intellectual property development fund.

Action Achieved/In Progress:

- UNTHSC has committed \$100K/year for IP development and protection.
- OTDC has made excellent progress in organizing the documents and properties of the office.
- OTDC Director McClain has been meeting individually with HSC faculty to discuss potential IP issues; these meetings are ongoing.
- McClain is assisting the Intellectual Property Advisory Committee in updating IP policies and procedures.
- OTDC has been offering a series of Intellectual Property workshops to raise awareness and enhance investigator knowledge of IP issues. These workshops will continue in Fall 2005.

19. Organizational Impediments to Research

Service Offices

Streamlining service office and other operational procedures will improve efficiency of research dollar procurement by maximizing time available for conducting research and submitting research proposals for funding. The recent implementation of the procurement card has resulted in decreased complexity of ordering increasing time available. This is a step in the right direction but additional modifications to these areas and other areas such as hiring personal would be valuable.

Recommendations:

- The RAC should establish a permanent committee with the charge and authority to investigate procedures related to hiring research personnel, purchasing, shipping and receiving, human resources, travels, etc. They should formulate recommendation for changes and these should be considered by the RAC and should be forwarded to the President for action.
- This RAC committee should evaluate similar service divisions at other institutions to determine how to most effectively restructure our service divisions.

Actions:

20. Costs and Sources of Revenue for Implementation of this 5-Year Strategic Plan

The following costs of implementation of this research strategic plan are divided into Critical, Necessary and Desirable. All costs are 5-year totals.

Critical:

2005-07: Complete construction of floors 3 and 6 as proposed in the NIH facilities grant application. **Estimated 5-Year Costs of \$3,693,470**

2006: Move occupants of floor 3 not in need of modern laboratory space to offices in other UNTHSC facilities, such as EAD, RES or available space in the OMC complex. **Estimated 5-Year Costs of \$100,000**

2007: Renovate CBH floor 3 into modern laboratories for basic research. **Estimated 5-Year Costs of \$2,000,000**

Increase substantially start up packages for basic science, public health and clinical faculty over the next 5 years. **Estimated 5-Year Costs of \$13,600,000.**

Increase the number of basic science faculty 4/yr, and clinical faculty by 3 /yr and 3 SPH faculty per year for the next 5 years at the UNTHSC. (Based on as expected annual salary for basic science and public health faculty of \$80,000 and of clinical faculty of \$150,000.) **Estimated 5-Year Costs of \$12,640,000.**

A clinical research center (CRC) that has at least a dozen beds and is equipped with all needed instrumentation needed to conduct most clinical studies. **Estimated 5-Year Costs of \$500,000.**

Total 5-year cost to implement Critical items = \$32,533,470

Per year costs to implement Critical items = \$6,506,694

Necessary:

Annually \$100,000 should be set aside to stimulate multidisciplinary team development. **Estimated 5-Year Costs of \$ 500,000.**

Reinitiate an Annual Faculty Research Grant Program to address the research support needs of new faculty and established faculty with changing research directions. **Estimated 5-Year Costs of \$500,000.**

Fund Institutes for Discovery for the next 5 years:

Estimated 5-Year Costs of \$ 500,000.

Total 5-year cost to implement Necessary items = \$1,500,000

Per year costs to implement Necessary items = \$500,000

Desirable:

The renovation of all “non-renovated” laboratories in EAD and RES in the next 5 years. (invest \$1.5 million per yr for 5 yrs.) **Estimated 5-Year Costs of \$7,500,000**

Annual institutional expenditure on research instrumentation should be about 10% of the annual total research income of the institution. **Estimated 5-Year Costs of \$15,000,000**

Enhance institutional commitment to pre-doctoral training by 10% per year for the next 5 years. **Estimated 5-Year Costs of \$1,090,425**

Hire a transgenic specialist who can develop needed new transgenic animals for UNTHSC investigators. **Estimated 5-Year Costs of \$500,000.**

Enhance the instructional commitment to technology transfer. **Estimated 5-Year Costs of \$500,000.**

Total 5-year cost to implement Desirable items = \$24,590,425

Per year costs to implement Desirable items = \$4,918,085