Medical School – Basic Research
AHC Strategic Planning Initiative 2000

Phase I Report of the Medical School Committee on Basic Research

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I. Summary

The Medical School is losing ground to other institutions in the area of research. The Medical School’s ranking in National Institutes of Health (NIH) funding dropped from 15th in 1982 to 27th in 1999. The National Research Council ranking of our biomedical graduate programs dropped from the 20s in 1983 to the mid 30s in 1995. The Medical School faculty does not have a National Academy member, and only one Howard Hughes Medical Institute investigator, who was recently recruited from another institution. Increased demands on clinical faculty members to spend more time on patient care and less time on research, a lack of growth in the number of Medical School faculty, lack of consistent funding for biomedical graduate programs, and a lack of incentives to retain the most productive researchers contribute to these negative trends.

The following solutions are recommended.

• Ensure that clinical faculty members have enough time to focus on research.

• Develop an objective system to measure research quality.

• Provide incentives for research productivity.

• Develop a research quality-based mechanism for laboratory space allocation.

• Hire new faculty in high priority areas.

• Provide stable financial support to biomedical graduate programs.
II. Defining Questions to be Addressed in Phase I

AHC administration asked each Phase I committee to consider the following questions:

1. What is the AHC's role in the health of Minnesotans?
2. How are we going to be a real player in the health care delivery process?
3. What is our vision for the health professionals that we educate and train?
4. How will we achieve being top-ranked in research performance?
5. How are we going to meet the web challenge?
6. How will we develop a culture of service and accountability, in both internal and external relations, and foster good communication and consultative decision-making?

III. Answers and Recommendations

Only question 4, “How will we achieve top-ranking in research performance?”, will be addressed in this report. Several rankings suggest that the Medical School is losing ground to other institutions in the area of research. The Medical School’s ranking in NIH funding dropped from 15\textsuperscript{th} in 1982 to 27\textsuperscript{th} in 1999. The National Research Council ranking of University of Minnesota biomedical graduate programs dropped from the 20s in 1983 to the mid 30s in 1995. US News and World Report recently ranked the University of Minnesota Medical School 36\textsuperscript{th} among US medical schools. Finally, the Medical School has not produced, or recruited the very best researchers.

A. Ensure that our clinical faculty members have enough time to focus on research.

There was a clear sense among the committee members that our drop in ranking based on NIH funding is due largely to a reduction in grants to clinical investigators. (It should be noted, however, that we could not come up with a way to confirm this sense from available data.) The committee felt that this loss was due to erosion of the time that our clinical faculty members can devote to research. Many clinical investigators are under pressure to devote time to clinical care because their division does not have enough physicians to see patients, or because they are expected to recover their salary by treating patients. The highest priority recommendation of this committee is that measures be taken to protect the time of clinical faculty members who wish to focus on research.

The committee agreed that it will be crucial to remove the financial pressure on clinical researchers to spend large amounts of time on patient care. One possible solution would be to create an internal research organization modeled after the Howard Hughes Medical Institute and funded by a new endowment (probably Capital Campaign funds). The funds
could be used by the investigator for any purpose related to their research mission. Support would have to be renewed every 5-7 years based on productivity. Preference would be given to scientists in clinical departments, who could use the funds for their salary, thus protecting their time to do research. Basic and clinical research would be eligible for support as long as the scientist involved was in a clinical department. Awards would be decided by a Research Council (see below) comprised of our top scientists, based on the productivity criteria described below, and consultation with external experts. The funding decision would be made purely on the quality of the applicant’s past scholarship (assessed according to the formula described below) and future potential. Committee work, local political connections, and University of Minnesota service would be irrelevant. It would also be worth considering the possibility that scientists from basic sciences departments could be eligible for funding through this mechanism to protect their research time from committee and teaching responsibilities. Funding through this mechanism may be preferable to life-long endowed chairs mentioned below because the award would have to be renewed every 5-7 years based on productivity.

Another solution would be to provide a tenure-protected, competitive base salary to clinical scientists that is not tied to clinical care services. This type of “hard money” salary is what is provided to basic science faculty members in the Medical School, and effectively protects the time of these individuals to focus on academic activities. Faculty members would be chosen for this type of support based on the measures of research quality described in section B below. Like the research organization solution described above, this solution would require a very large investment of new money because only a fraction of the salaries of most faculty members in clinical departments is protected by tenure.

The least favored option recommended by this committee would be to formalize the division of labor between researchers and clinicians, which is already occurring in clinical departments. Clinical faculty members who enjoy seeing patients and are good at it, would see most of the patients and do clinical teaching to residents and medical students. Their salaries would be tied to the quantity and quality of their clinical care and teaching. Individuals in this track would not have all of their base salary protected by tenure. This would allow other clinical faculty members to spend time on research. It should be noted that this system is now operating in the Department of Medicine but does not fully protect the time of researchers. Therefore, a more extreme form of the system would have to be put in place with enough new money infused to truly protect the time of the researchers. In addition, more thought would have to be given to the status of faculty members in the clinical track. On what basis will they be granted tenure? Will they be expected to have scholarly output?

B. Develop an objective system to measure research quality.

The outcome of many of the decisions made in the Medical School and AHC concerning individuals and programs will depend on accurate assessment of research productivity. This committee strongly recommends that the Medical School Administration develop a
quantitative and objective system to measure research quality. The system should be applicable across all fields and give weight to the variables that correlate best with successful research programs. No objective and uniform system is currently in place, although the committee had the sense that total grant income and number of papers published are currently used for promotion and tenure and resource allocation decisions. Both of these parameters have limitations as measures of quality. Publications are worthless if they are never read by anyone or fail to influence the field in a positive way. Adding up grant dollars is also limited by inherent differences in the costs related to one kind of research versus another, and difficulties in assigning credit to individual researchers on program project grants. This committee believes that the best indicator of quality research is external peer recognition. The best indicator of external peer recognition for scientific papers is citation in the publications of peers. Citation rates for individual papers can now be easily determined on the Internet. By valuing citation rates over publication rates, we will be valuing publications that are influential, not just in print. Some estimate that 50% of the scientific literature is never quoted by anyone other than the authors. In addition, we have to pay heed to citation rates because the National Research Council uses them to rank the scholarly output of graduate programs.

The best indicator of peer recognition for grant submissions is funding itself. Competitive renewal is a good indicator that progress was made on the project proposed in the original grant. This committee recommends that a research quality assessment formula be developed that relies heavily on the number of peer-reviewed grants (not the dollar amounts), the number of peer-reviewed grants that have been competitively renewed, and the citation rate of the publications of the individual/program in question, averaged for several years. The formula should be considered for decisions concerning promotion and tenure, post-tenure review, new hiring, space allocation, and identification of institutional strengths and weaknesses.

C. Provide incentives for research productivity.

Although the strongest motivation to do quality research comes internally from individual faculty members, external incentives might help to improve the productivity of our current researchers.

A simple measure would be for Medical School Administration to state that it is expected that all faculty members involved in research should have at least one K-series, RO1, or PO1 grant from the NIH, or an equally sized grant from another agency. Even if this standard was not enforced, it could be an effective psychological inducement.

This committee recommends that the quality assessment method described in section B above be used in promotion and tenure decisions and in post-tenure review to provide an incentive to our faculty to do quality research. Anecdotal evidence indicates that the Medical School tenuring rate is over 90%. In addition, the Medical School post-tenure review process varies greatly between departments and in many cases, is not an effective tool. Rigor could be added to both processes by giving more weight to measures of
quality, for example as described above, citation rates of publications and grant renewals. More rigorous standards should have the long-term effect of improving the overall quality of the faculty.

A positive financial incentive should be put in place to reward high productivity. One way to do this would be to limit salary raises above the tenure-protected base to "merit-based" increases. Highly productive individuals (based on the objective parameters described in section B) would then be rewarded with increased salary. In this way, salary incentives would be paid only to the most productive individuals, freeing up revenue for additional investment. At the same time, base salary protection would remain strong.

It would also be beneficial to provide additional training in communications and research technology to mid-career faculty members, and effective mentoring to junior faculty. Financial rewards could be given to faculty members who offer courses in emerging technologies, to be taken by other faculty members. Mentors could be senior faculty members who have been effective at obtaining research grants.

D. **Develop a research quality-based mechanism for laboratory space allocation.**

Many contentious issues related to research space allocation are currently unresolved. It is the recommendation of this committee that a uniform and objective laboratory space allocation mechanism be developed. This mechanism should include guidelines for the amount of resources required to justify occupancy of a given amount of space and should take into account the measures of research quality described in section B. Requests to the administration for increased research space would have to be based on the resources controlled by the requesting group and quality of their past research as defined in section B. The administration should call on the Research, Basic Sciences, and Clinical Sciences Councils to help adjudicate contentious issues related to laboratory space.

E. **Provide stable financial support to Biomedical graduate programs.**

The quality of our graduate programs is essential to our ability to receive good rankings. The National Research Council ranking of graduate programs was used by US World and News Report in their rankings, which are read by many prospective applicants. The major biomedical graduate programs from which Medical School faculty members get their Ph.D. students are funded by an ad hoc process, whereby Directors of Graduate Studies go every year to various department or center heads and beg for funds. This lack of consistent central funding creates many logistical problems. The current request to the State Legislature to procure a consistent source of central funding of first year Ph.D. and M.D./Ph.D. students in biomedical graduate programs should be given a high priority.

F. **Hire new faculty in high priority areas.**

The University of Michigan Medical School improved its NIH rankings during the same 20-year period that our rankings fell. One contributing factor was that the University of
Michigan continued to hire new faculty members during that period. Today, the University of Michigan Medical School has almost twice as many faculty members as the University of Minnesota Medical School, explaining in part why they bring in more NIH funding. A key element of the Medical School strategic plan involves investment in certain high priority programs that show great promise, are currently weak and need to be rebuilt, or are currently strong and thus have the potential to attract the best applicants. This committee recommends that the objective measures of research quality described in section B should be used by the administration to identify the promising, weak, and strong programs. Furthermore, once these programs are identified the same objective measures should be used to evaluate potential job applicants.

IV. Conclusion

Implementation of these recommendations will require the investment of new money. It is unreasonable to expect that significant improvement in our NIH ranking can be achieved by simply placing higher expectations on the faculty or reorganizing it into different groups. It is the strong conviction of this committee that a more rigorous and objective assessment of research quality is necessary to optimize the return on this investment.