THE OPTIMAL ENVIRONMENT FOR BASIC-SCIENCE RESEARCH

Advice to the Dean, Larner College of Medicine

from

the Faculty Committee on the Optimal Environment for Basic Science Research

May 23, 2017

EXECUTIVE SUMMARY

In response to a charge from the Dean, Larner College of Medicine, in February of 2017 the Faculty Committee on the Optimal Environment for Basic-Science Research prepared this report, in which we provide advice on the best targeting of resources to improve basic-science research in the College. In this report, we present a set of recommendations for changes in both targeting of financial resources and management of human and physical-plant resources arising from a review of the current budget plan, consideration of the advice of the faculty, and a synthesis of ideas for change from within the committee and across the faculty at large. We also provide suggestions originating with the faculty for innovations and a suggested plan for assessing the impact of the proposed changes. A survey of the College faculty served as the basis for representing faculty sentiment and developing recommendations.

Recommendations for Change in the Current Funding and its Management

1. Increase salary support for time invested in teaching and service.
2. Maintain a critical mass of basic-research faculty.
3. Redesign and expand support for Core Facilities based on IBB-relevant review of use and impact.
4. Shift funding from the College to basic and clinical departments that house basic research with the goal of providing flexibility and recruitment capability within the departments.
5. Increase support for graduate students and post-doctoral fellows.
6. Make more dollars available to fund pilot projects.
7. Reduce or discontinue investment in the Faculty Incentive Plan.
8. Critically evaluate the money being spent on the Centers.

New Initiatives:

1. Hire and support new faculty doing basic-science research.
2. Provide funding for new cores such as Crispr/cas 9, RNAi, and plasmid-prep technologies.
3. Increase College investment in cross-departmental infrastructure such as autoclaves, centrifuges, water filtration and distillation, and image developers.
4. Support the development of research teams
5. Increase fund-raising activities for basic-science research.

Assessing Impact

An annual report by the Dean to the College faculty should be inaugurated that comprises an update on the investment into each of the variable basic-science support categories, to include amount invested and the change in percentages from previous years.

It should also include

1.) a summary of indicators of impact arising from the changes
2.) a summary of the College's actions on key recommendations
3.) an appropriate assessment of the progress on the eight key recommendations
4.) assessment of faculty morale and satisfaction with the basic science environment

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1. INTRODUCTION

PREAMBLE

The goal of this report is to contribute to the growth of basic-science research throughout the Larner College of Medicine at the University of Vermont, in both clinical- and basic-science departments. We open this report with a preamble that addresses two questions: 1) what is basic science and 2) what is the value of basic science to the College and to society at large.

Traditionally, basic research yields general knowledge and an understanding of nature and its laws. This general knowledge provides the means of answering a large number of important practical problems, though it may not give a complete specific answer to any one of them. Thus, the main objective of basic research is the acquisition of knowledge without the obligation to apply it to practical ends. The function of applied research is to provide the more complete answers (Bush, 1945). In more recent times, basic research has been carried out, at least in the health sciences, with a consciousness of the relevance of the general knowledge being pursued to its potential for application to the improvement of the human condition. The boundary between basic and applied research has blurred as basic scientists have sought relevance for their inquiries to health-related needs. Here, we acknowledge that this middle ground exists, a ground that is perhaps best captured in the concept of translational research. Translational research fosters the multidirectional and multidisciplinary integration of basic research, patient-oriented research, and population-based research with the long-term aim of improving the health of the public (Rubio et al., 2010). To the extent that translational research incorporates basic research, it is activity to which this report pertains.

Basic Science is critical to the mission of the College because the training of superior clinicians requires that their education as medical students include a fundamental knowledge of basic-science concepts and methods, as well as an understanding of how and where the evidence in evidence-based medicine is generated. This education comes about through the orchestrated efforts of faculty, staff, postdoctoral fellows, graduate students, and undergraduate students. Even more fundamentally, the basic-science research conducted in the College proceeds from a central tenet of the College's mission, "to bring hope to patients by advancing medical knowledge through research; to integrate education and research to advance the quality and accessibility of patient care." The College's reputation as a first-rate medical school and its ability to recruit and train the best of the next generation of physicians utterly depends on a robust, thriving basic-science research program.

The Committee, informed by its preparation of this report and substantial survey of the College's faculty, has reached a key insight. We find that our charge was narrow and confined, so much so that a key charge, to pay attention to the basic-research community as a society of scholars, was lacking. We urge the Dean to continue the process begun here by expanding the goals to the articulation of a specific vision for the role of basic-science research in the College, one that has as its fundamental premise the nurturing of this community of basic scientists. We recommend that the exploration of ways to improve support for basic-science research in the College should be in the context of a ten-year vision for the College's basic-research faculty community. Key

agendas should include building faculty numbers and diversity of faculty research expertise. Consideration of proposed changes in support of basic research should be carried out in the context of detailed comparative analysis of data-rich profiles of other institutions.

HISTORY OF THE LARNER COLLEGE OF MEDICINE STRATEGIC PLANNING PROCESS

In the spring of 2015, over 200 faculty and staff of the Larner College of Medicine (LCOM) responded to a call for volunteers to participate in updating the Strategic Plan in several key areas. From that group, over 60 people were selected to serve on four committees, two focused on research and two on education. Those committees were charged in May 2015 to assess and make recommendations on research direction (Research A), research support (Research B), developing non-doctoral courses and programs using existing faculty expertise (Education A), and leveraging the newly expanded University of Vermont Health Network for academics (Education B).

Each of the four committees interviewed many stakeholders across the College and met multiple times during the summer of 2015. These efforts culminated in a day-long retreat in late August with 100 faculty in attendance where each committee presented key strategies for discussion and feedback. An Executive Committee was formed (comprising members from each of the four original committees) to draft an integrated report. The draft report was reviewed by the College of Medicine's Advisory Committee (Chairs, Center Directors, Deans), was circulated to the faculty for review and comments, and reviewed at a College Faculty Meeting in January of 2016.

RECOMMENDATIONS FROM THE 2015–16 STRATEGIC PLANNING PROCESS

Proposed Research Initiatives are to have two principal thrusts:

1. to improve the success of our research efforts being externally funded, published, and widely recognized. This thrust includes support
    a) for individual faculty members developing their research careers,
    b) for programmatic work of groups of faculty working together through interdisciplinary, team-science, and other large-grant opportunities, and
    c) for the Institutional Infrastructure that supports all types of research.
2. to improve the funding of our research engine by diversifying its sources of support directly by obtaining support from Corporations and Foundations and individual philanthropy, and indirectly by applying margins from the development of new non-doctoral educational programs.

NEXT STEPS RELATING TO RESEARCH, FROM THE JANUARY 2016 REPORT

- Funding: Increase the funds available to our investigators by diversifying the sources of direct research support
- Faculty: Maintain strong faculty mentoring and infrastructure support to foster research excellence and success.
- Programmatic and Health-Services Research: Have strong cross disciplinary programmatic research in key areas, exhibiting collaboration and integration among basic scientists, translational researchers, and clinicians.

- Institutional infrastructure: Have an infrastructure to facilitate and support basic, translational, clinical, and health services research.

These *Steps* were developed by the LCOM Dean's Office group into a set of plans for new funding for FY-17 relating to the strategic-plan priorities. The funding was designated as follows:

I. Research: Funding A. Structure for seeking support from private sources: $150,000 for 1.0 FTE

II. Research: The Faculty
- A. Formalize Mentoring Program and Provide Training Support: $40,000 for 10% increase in FTE and Operating Expenses
- B. SWAT Team and Navigator at College level: $100,000 to create new position
- C. Review Bridge and Internal Grant Programs: Additional $100,000 for new targeted requests for proposals
- D. Faculty Incentive Program: $1 million investment in research bonus program for faculty

III. Research: Programmatic Research
- A. Encourage investigators to serve as PIs for training grants or other major institutional grant opportunities: $100,000 to support up to 20 % of PI salary (NIH cap) for 2-3 months while writing these proposals
- B. Recruit Leadership and supporting personnel for Health Service Research: $2,500,000.

IV. Research: Institutional Infrastructure
- A. Improve Clinical research processes and policies: $150,000 for support staff for new central administration
- B. Review bioinformatics infrastructure: $2,000,000 for new consulting service Ph.D. and M.S.-level faculty
- C. Basic science bioinformatics recruitment: $500,000 for joint recruitment with CEMS
- D. Graduate students: $10,000 for competitive graduate student stipends (top off supplement)

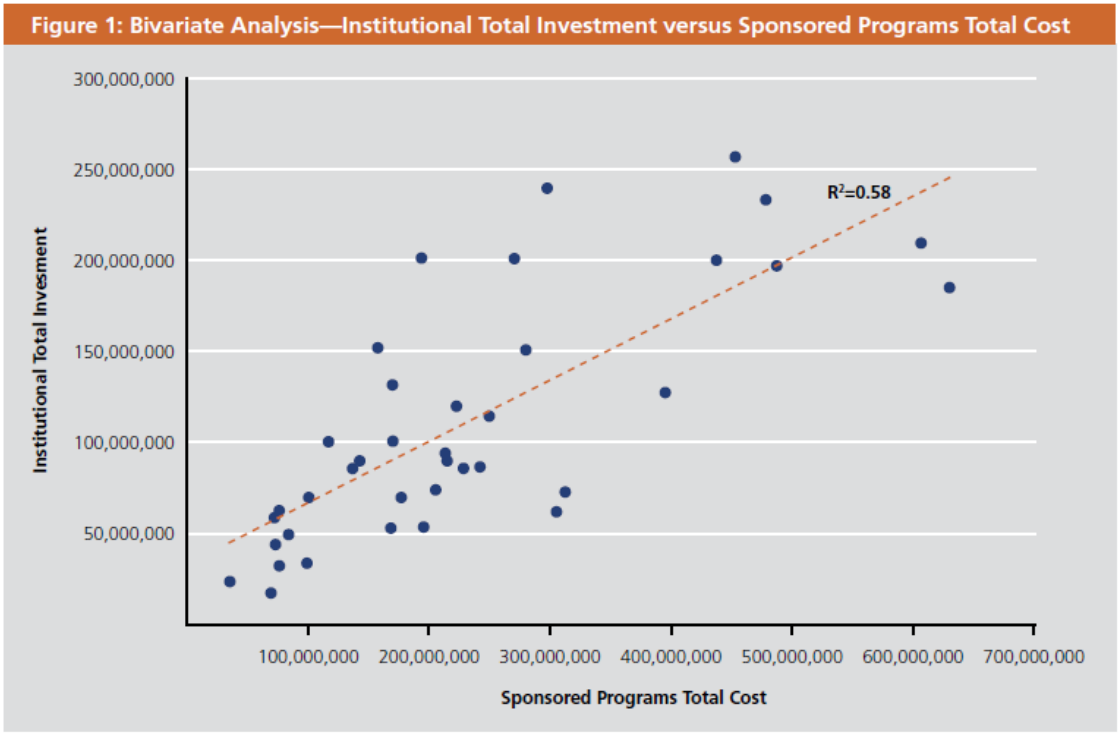
ORIGIN AND CHARGE OF THE FACULTY COMMITTEE ON THE OPTIMAL ENVIRONMENT FOR BASIC SCIENCE RESEARCH, JANUARY 2017

The committee's role in this process was to advise the Dean on the optimal environment for basic science and laboratory investigators through a review of the current forms of support to discover whether there are better ways to support LCOM basic-science investigators.

A key context for understanding the committee's charge is the 2015 AAMC Technical Report on Academic Medicine Investment in Medical Research (AAMC, 2015). The central outcome of the report was a representation of the relationship between Medical College internal investment in research and success at attracting extramural

funds. Nationally, the average Medical School investment was $0.53 for each dollar of sponsored research received; UVM's investment is $0.55 (The College spent $35.8M in FY13 to support research). In FY 2016, the College received just over $90 million in external funding (of which $64.8 million is direct) to support basic science and clinical research (UVM Office of Institutional Studies). Figure 1 provides insight into the national patterns.

Figure 1, from Fig. 1 of the AAMC Report



Arising from this analysis was a recasting of the question for the Committee: are there ways to reallocate current support for faculty research so that LCOM gets more sponsored research dollars for its internal investment? As some colleges of medicine produce more external research funding for the amount of money we are investing, can we be more effective and efficient with our funds?

Considering the AAMC Report in greater detail reveals their concept of the kinds of expenses that relate to support for faculty winning external funding (Figure 2).

These variables are:

1. Mandatory/voluntary cost-sharing
2. Over-the-salary-cap cost-sharing
3. University research
4. Start-up packages
5. Bridge funding
6. Cost overruns
7. Additional salary support or research effort
8. Other institutionally funded research
9. Unrecovered OR/OSA F&A subsidies
10. Departmental-research F&A expenditures

Figure 2, from Fig. 15 of the AAMC Report

Figure 15: Institutional-Research Expenditures by Category

Institutional Expenditure Category	Institutions < $150 Million Sponsored TDC		Institutions > $150 Million Sponsored TDC		All Institutions	
	Mean	SD	Mean	SD	Mean	SD
Mandatory/Voluntary Committed Cost Sharing	$2,231,102	$1,839,489	$7,147,669	$6,282,805	$4,878,484	$5,334,309
Over-the-Salary-Cap Cost Sharing	1,913,608	1,529,504	7,733,679	6,449,711	5,114,647	5,658,415
University Research	2,210,684	5,391,777	4,251,558	7,710,615	3,258,701	6,672,655
Start-up Packages	4,965,460	4,676,897	14,660,198	13,491,399	9,681,819	11,000,981
Bridge Funding	2,803,434	4,246,547	5,137,115	6,031,706	4,001,811	5,301,388
Cost Overruns	907,487	1,838,641	1,763,152	3,252,890	1,410,819	2,758,029
Additional Salary Support of Research Effort	13,626,422	14,523,790	16,433,587	18,459,411	14,942,281	16,272,222
Other Institutionally Funded Research	5,095,569	5,745,026	11,249,160	9,394,742	8,079,128	8,223,663
Unrecovered OR/OSA F&A Subsidies	19,586,549	13,583,775	42,829,883	25,663,843	31,819,883	23,692,300
Departmental-Research F&A Expenditures	15,558,780	11,077,629	32,053,322	20,891,879	24,240,118	18,713,040
Total Institutional Expenditures	**$69,237,092**	**$36,171,992**	**$148,874,569**	**$65,413,880**	**$111,151,553**	**$66,500,737**
Total Sample Size	**18**	**18**	**20**	**20**	**38**	**38**

In response to a charge (Charge Memo, Appendix 1) from the Dean, Larner College of Medicine, in February of 2017 our committee (membership, Appendix 2) prepared advice for best targeting of resources to improve basic-science research in the College. In this report, we present a set of recommendations for changes in both targeting of financial resources and management of human and physical-plant resources arising from a review of the current budget plan, consideration of the advice of the faculty, and a synthesis of ideas for change from within the committee and across the faculty at large.

2. METHODS

DEVELOPMENT OF KEY FUNDING VARIABLES

During the first meetings of the Committee, the members developed a set of key funding variables from the recent Strategic Planning documents and the AAMC variables, informed by conversations with Assistant Dean for Finance Brian Cote (Appendix 3). From this list we excluded investment variables that are not possible to reallocate, with advice from the Dean's office. These variables included cost-share and faculty start-up packages, which are either fixed or under the purview of the Chairs, not the Dean. Variables that pertain to the applied-research community in the College were also excluded. The final version of these variables served as the basis for the list of options for choosing priorities for support on the faculty survey (Table 1).

Faculty attending the forum expressed frustration that the Deans Office did not provide an explanation of the basis for distinguishing fixed versus changeable fund allocations. College faculty participating in the forum suggested that a better report would have been possible were these data more fully developed for our inquiry.

Though it is possible to match funding allocations to the sources for the funding, we did not pursue this information because of time demands—thus for instance, we cannot provide information on the amount of indirect funding (total LCOM FY17 F&A

Recovery was $16.7M) that is invested in funding support for basic science. The faculty at the Forum were disappointed that more information about use of indirect funds was not available. The disappointment originates with the strong feeling that a wise route to providing incentives is for the College to provide financial enhancement to investigators who are successful in winning grants in proportion to the indirect funds they attract to the College, as other colleges at UVM do.

TABLE 1. FINAL LIST OF FUNDING PRIORITIES expressed as a percent of the total investments in these variables.	
Support for Core Facilities	27%
Support for two Centers[1]	18 %
Ph.D. Faculty Incentive Program	14%
IT Support	10%
Biostatistics & Bioinformatics consulting support	9%
Doctoral programs[2]	8%
Bridge funding	6%
Pilot project funding	6%
FTE contribution for preparation of large grants	1%
Grant preparation SWAT team	1%
[1]1.065M for Vermont Cancer Center and - 175K for Office of Health Promotion Research	
[2] includes Ph.D. student stipends)	
[3]includes ongoing Training Grants[2]	

ASSESSMENT OF ISSUES OF GREATEST CONCERN TO THE FACULTY

Early in the Committee meetings, it became clear that committee members had strong opinions about the need to address management problems that impacted basic research productivity. We chose to develop these problems into a set of key management issues, which we pursued in two ways. First, the Committee members provided input on the significance of each issue, with the opportunity to elaborate on the problem. Second, the Committee developed a small set of issues questions that was included in the College-wide survey of the faculty doing basic-science research.

SURVEY OF THE COMMITTEE

The Committee felt strongly that the faculty engaged in basic-science support should have fair and equal access to the committee. Consequently, we chose to decline requests for individual interviews with the committee in favor of an on-line survey that all faculty had the opportunity to take, followed by a community forum in which the results of the survey, as incorporated into a draft report of the committee, could be addressed by the faculty at large.

Members of the Committee developed a first draft of the survey for internal review. An early draft of the survey served to assess the Committee's sentiments on the funding priorities and management issues.

SURVEY OF THE FACULTY

The early draft of the survey was developed for on-line production over several committee meetings, with substantial input from those experienced in the habits of the College faculty and the financial aspects of the priorities. Conversion to an on-line format was done by Joann McVeigh from the Dean's Office, using REDCap (Harris et al., 2009). The final survey is included here as Appendix 4. The Committee members first took the online survey to discover problems, then the survey link was distributed to ***all*** LCOM faculty members. The survey specifically noted that those not involved in basic research need not reply.

FACULTY FORUM – RESPONSES TO THE DRAFT REPORT

All College faculty were invited to an open forum to provide input into the draft version of the report. Participation in the forum was excellent; more than 50 College faculty attended; those attending contributed to a spirited discussion of the issues relating to supporting basic-science research. The faculty were clearly invested in the long-term viability of the College and its faculty. Our lengthy notes from this meeting were used to enhance the draft in an array of places. The preamble to the report is a specific outcome of contributions at the forum.

ANALYSIS

Quantitative Analysis of Priorities Data

On the survey (Appendix 4), the faculty were provided the current distribution of funding for each of the ten categories identified as available for change by the Committee. The faculty were then invited to input their preferred distribution of funding for these ten items. The full dataset of faculty responses was used to compute basic statistical measures, including mean, standard deviation, and standard error. Key to this analysis, differences between the preferred and current percentage investments were computed for each question. The responses were analyzed for both all faculty responses pooled and separately within each faculty pathway and rank.

Analytical Methods for the Graphs

Approach Following from the goal of this committee to optimize the environment for basic research in the College, data from the faculty survey were sorted based on faculty self-reporting of the portion of their research that was basic. Given the charge to the committee, answers from faculty reporting 0% effort in basic research were excluded. In these trimmed data (n=68), there were slightly more than half who reported that 100% of their research effort was basic; the remainder, ranging from 1% to 98%, were placed in a second category, <100%. This split was made to understand whether effort in basic research correlated with opinions on expenditures.

Tools: The primary purpose of the analysis was to query whether the reported basic-research effort was correlated with a difference in mean allocation within each category. Based on this goal, each category was treated as a separate set of data with the null hypothesis that faculty distribution would not affect allocation and that both halves would not be different from the total faculty answers. Thus, we used one-way ANOVA with a Tukey's post-hoc test to correct for multiple comparisons for data that were normally distributed. For data not normally distributed (FTE support and SWAT), we used an ANOVA with Kruskal-Wallis non-parametric test. Only changes that were significant between groups (at $p<0.05$) are noted on the graphs. All graphs and statistics were generated in GraphPad Prism. Data grouped as described above were plotted for each variable as *total* for total answers, and separately for the two categories of self-reported basic research effort.

Synthesis of the Contributed Comments

Our approach to assembling the written comments from faculty into a representative synthesis of faculty opinion in the College was to divide into five working groups, each focused on a specific subset of the comments. The five subsets comprised one for each of the issues questions, one for the new ideas for investment in basic research by the College, and one for comments on reallocation of existing funds and other comments. The teams were charged with reducing the whole array of comments into a distillation of common themes, then synthesizing this reduction into a succinct, representative paragraph.

3. RESULTS

FUNDING PRIORITIES (DERIVED FROM THE FUNDING-PRIORITIES SURVEY)

Faculty Participation by Pathways and Ranks

For context, we provide the current numbers of College faculty by pathway and rank. With these numbers in mind, we provide a response profile (Table 2).

Tenure Pathway
Clinical Departments – Tenured: 80; On Tenure Path: 14 – Total 94
Basic Science Departments – Total 35
Grand total: 129

Research Pathway
Clinical Departments – 32
Basic Science Departments – 20
Total: 52

TABLE 2: Response Profile, Faculty Numbers

	Asst Prof	Assoc Prof	Professor	Fac Scientist	Total
Research	13	7	1	1	22
Clinical	3	1	1	0	5
Tenure	5	8	43	0	56
Total	21	16	45	3	

Faculty Percentages*

	Number of Faculty	Number respond-ing	% Responding
Tenure Track	129	56	43%
Research Track	52	22	42%
Totals	181	78	43%

* nine of 655 Clinical Family responded.

Summary Tables for Faculty Responses

The quantitative data retrieved from faculty responses to questions soliciting changes in percent allocations to the ten currently funded programs (full percent-investments data, Appendix 5) reveal general sentiments. Prominent is the strong preference for continued funding for the Cores, leading to their remaining with the highest percentage of the funds. Faculty chose to increase the percentage of funding for doctoral students, bridge funding, and pilot funding. In contrast, faculty doing basic-science research recommended substantial decrease for funding of the Centers, except that Clinical Faculty engaged in basic research had greater support for the Centers, and Assistant Professors and Research/Clinical-track faculty had greater support for the faculty incentive program. See Tables 3 and 4.

Table 3 All Faculty Responses

	Support for Core Facilities (27%)	Support for two Centers (18 %)	Doctoral programs (8%)	PhD Faculty Incentive Program (14%)	IT Support (10%)	Biostat & Bioinformatics support (9%)	Bridge funding (6%)	Pilot project funding (6%)	FTE for preparation of large grants (1%)	Grant preparation SWAT team (1%)
SAMPLE SIZE	87	87	87	87	87	87	87	87	87	87
GRAND MEAN	28	11	12	11	9	9	8	8	1	1
ORIGINAL	27	18	8	14	10	9	6	6	1	1
DIFFERENCE	1	-7	4	-3	-1	0	2	2	0	0
STANDARD DEVIATION	7.8	6.1	6.8	9.9	3.1	3.8	3.5	4.2	1.1	1.0
STANDARD ERROR	0.8	0.7	0.7	1.1	0.3	0.4	0.4	0.5	0.1	0.1

Table 4
Faculty
Responses
by Rank
and Path

	Support for Core Facilities (27%)	Support for two Centers (18%)	Doctoral programs (8%)	PhD Faculty Incentive Program (14%)	IT Support (10%)	Biostat & Bioinformatics support (9%)	Bridge funding (6%)	Pilot project funding (6%)	FTE for preparation of large grants (1%)	Grant preparation SWAT team (1%)
	RANK: PROFESSOR									
SAMPLE SIZE	44	44	44	44	44	44	44	44	44	44
GRAND MEAN	29	11	12	9	9	9	8	8	1	1
ORIGINAL	27	18	8	14	10	9	6	6	1	1
CHANGE	2	-7	4	-5	-1	0	2	2	0	0
STANDARD DEVIATION	8.0	6.6	8.7	7.0	3.4	3.7	3.9	4.1	1.3	0.9
STANDARD ERROR	1.2	1.0	1.3	1.1	0.5	0.6	0.6	0.6	0.2	0.1
	RANK: ASSISTANT PROFESSOR									
SAMPLE SIZE	16	16	16	16	16	16	16	16	16	16
GRAND MEAN	25	15	10	14	9	10	7	9	1	1
ORIGINAL	27	18	8	14	10	9	6	6	1	1
CHANGE	-2	-3	2	0	-1	1	1	3	0	0
STANDARD DEVIATION	6.4	3.9	2.9	13.6	2.9	3.5	2.5	4.4	1.1	1.4
STANDARD ERROR	1.6	1.0	0.7	3.4	0.7	0.9	0.6	1.1	0.3	0.4
	RANK: ASSOCIATE PROFESSOR									
SAMPLE SIZE	21	21	21	21	21	21	21	21	21	21
GRAND MEAN	31	12	11	11	8	8	9	9	1	1
ORIGINAL	27	18	8	14	10	9	6	6	1	1
CHANGE	4	-6	3	-3	-2	-1	3	3	0	0
STANDARD DEVIATION	5.6	4.9	4.0	8.3	2.7	3.8	3.1	3.9	0.8	0.8
STANDARD ERROR	1.2	1.1	0.9	1.8	0.6	0.8	0.7	0.8	0.2	0.2
	PATH: TENURE-TRACK									
SAMPLE SIZE	53	53	53	53	53	53	53	53	53	53
GRAND MEAN	30	11	12	9	9	9	8	8	1	1
ORIGINAL	27	18	8	14	10	9	6	6	1	1
CHANGE	3	-7	4	-5	-1	0	2	2	0	0
STANDARD DEVIATION	6.4	6.4	8.1	6.8	3.1	3.4	3.9	4.2	1.2	0.9
STANDARD ERROR	0.9	0.9	1.1	0.9	0.4	0.5	0.5	0.6	0.2	0.1
	PATH: RESEARCH SCHOLAR									
SAMPLE SIZE	24	24	24	24	24	24	24	24	24	24
GRAND MEAN	28	12	11	13	8	8	8	9	1	1
ORIGINAL	27	18	8	14	10	9	6	6	1	1
CHANGE	1	-6	3	-1	-2	-1	2	3	0	0
STANDARD DEVIATION	8	5	3	13	3	4	3	4	1	1
STANDARD ERROR	1.3	1.3	1.7	1.4	0.6	0.7	0.8	0.9	0.2	0.2
	PATH: CLINICAL									
SAMPLE SIZE	6	6	6	6	6	6	6	6	6	6
GRAND MEAN	25	16	8	13	10	12	6	8	2	2
ORIGINAL	27	18	8	14	10	9	6	6	1	1
CHANGE	-2	-2	0	-1	-1	3	0	2	1	1
STANDARD DEVIATION	3.2	5.4	4.4	13.5	2.8	4.0	3.0	4.0	1.6	1.2
STANDARD ERROR	11.0	1.2	1.0	2.9	0.6	0.9	0.7	0.9	0.3	0.3

Graphical Representation of Faculty Opinion on Funds Reallocation

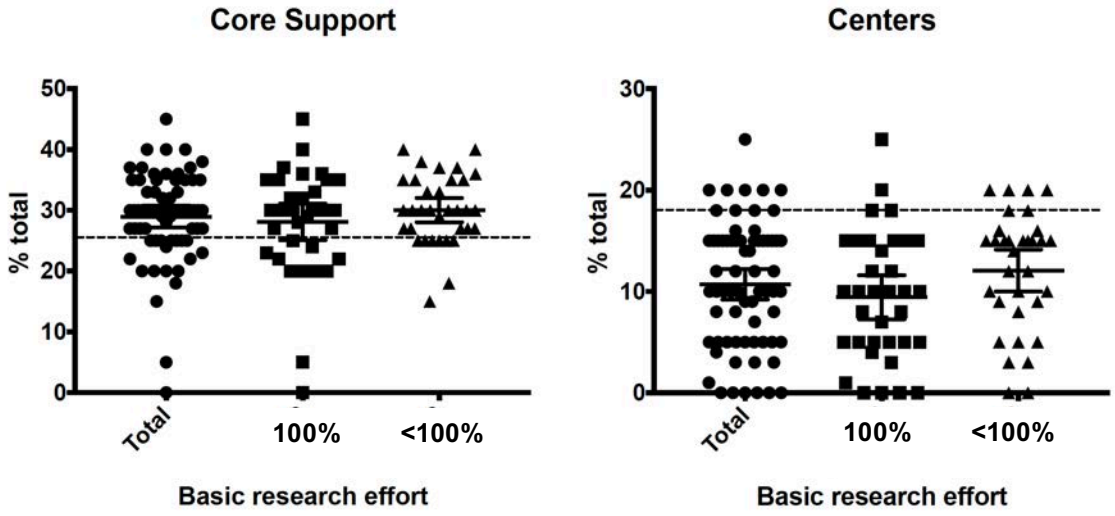
Here we provide a graphic representation of faculty responses portraying sentiment about reallocation of funds for each of the ten variables included in the survey. Each graph corresponds to one of the ten funding variables that were covered in the faculty survey. The y axis represents percent of the total funding available for change. The x axis distinguishes between faculty with high basic-science percentages in their work (100%) from those with lower (<100%) percentages; it also includes a cluster to represent the data for all faculty combined. Each symbol on the graphs represents a single answer. Mean and standard error for faculty preferences in this survey are represented by a vertical line crossed by three horizontal lines. In each graph, the horizontal dashed line represents the currently invested percentage, allowing visual comparison of current and preferred percentages.

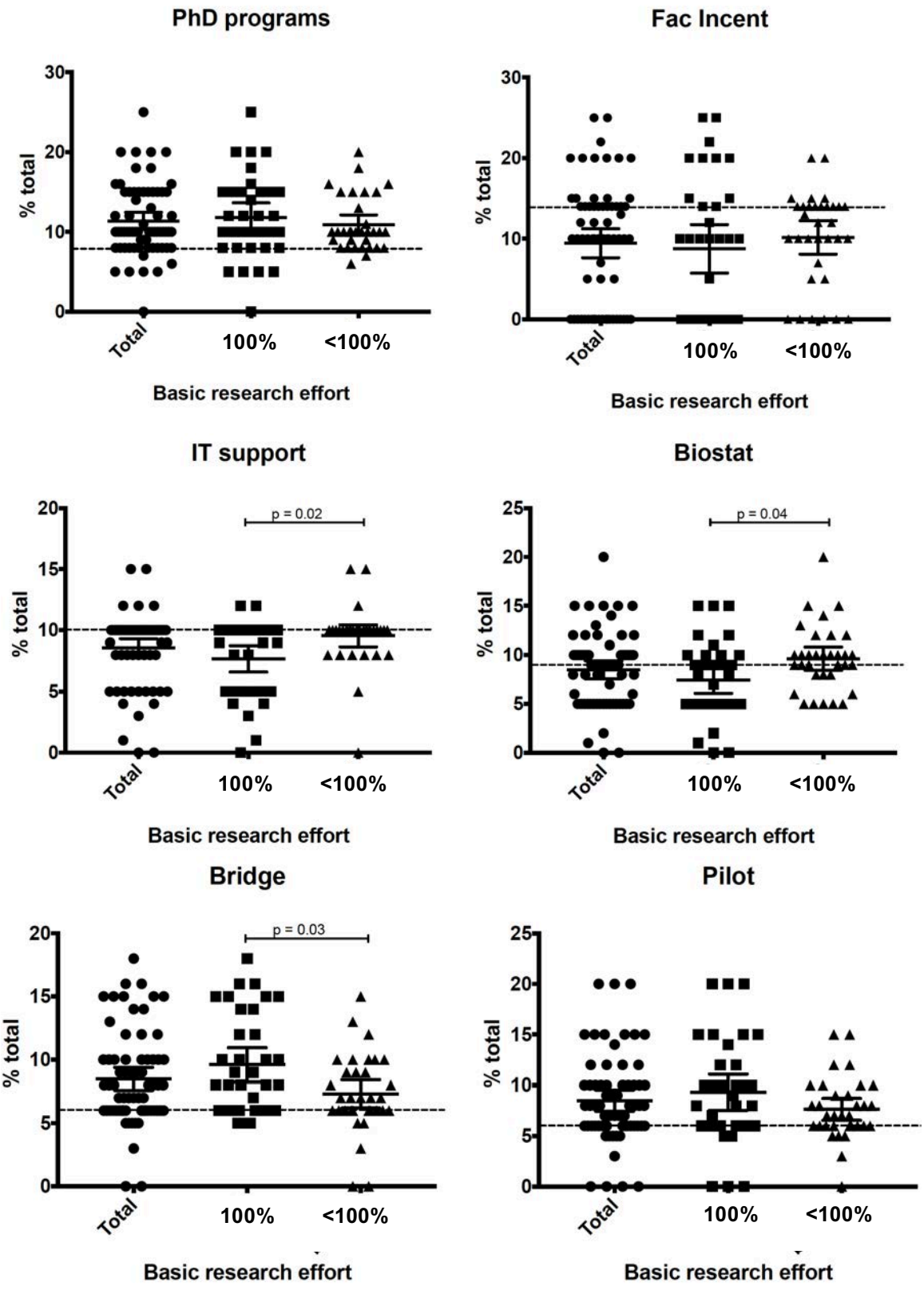
The ten graphs (Figures 3–12) provide a sense of the likely overall faculty consensus on shifting funding between existing programs. The confidence intervals for all but a few variables fail to overlap the current distribution, suggesting the faculty generally support changes in the COM expenditures on basic research. Increase for the Cores, Ph.D. programs, and Bridge and Pilot Funding are prominent. By contrast, there is strong support for decrease in funding for the Centers and the Faculty Incentive program. The vote for a deep decrease in support for the Centers stands out.

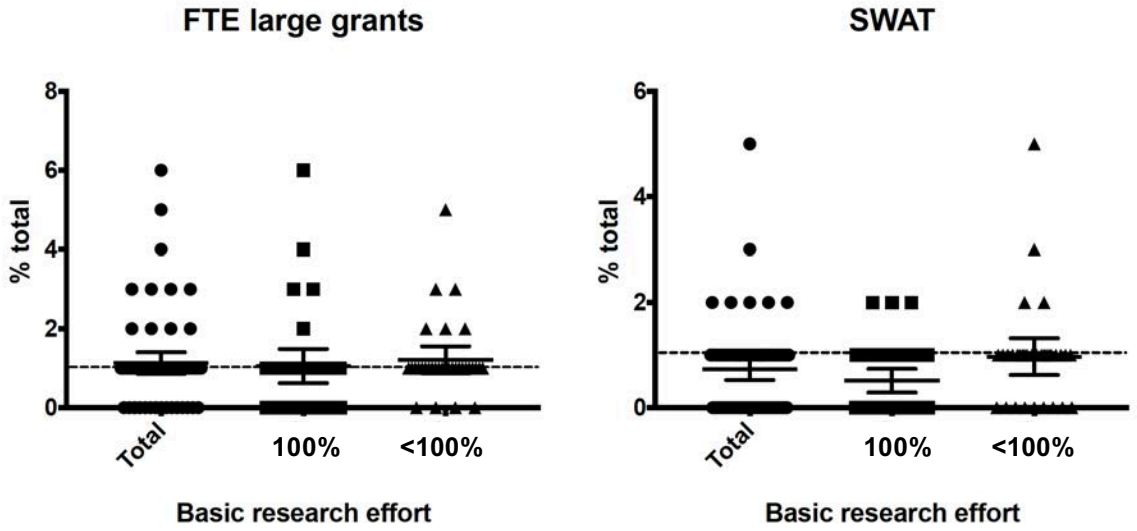
Also standing out is the number of faculty who indicated that little investment of LCOM money should be made to Centers, the Faculty Incentive Program, the Large Grants Support staff, and the SWAT Team. This further demonstrates the lack of LCOM basic science faculty support for the level of these current investments.

` Between faculty groups, it appears that faculty with lower percent effort on basic research value the IT and Biostat expenditures more than the Bridge Support, or conversely, faculty with 100% effort in basic research value bridge funding more than faculty less focused on basic research.

Figures 3–12. Graphical Representation of Faculty Financial Priority Responses.




PhD programs
% total
30
20
10
0
Total
100%
<100%
Basic research effort
Fac Incent
% total
30
20
10
0
Total
100%
<100%
Basic research effort
IT support
p = 0.02
% total
20
15
10
5
0
Total
100%
<100%
Basic research effort
Biostat
p = 0.04
% total
25
20
15
10
5
0
Total
100%
<100%
Basic research effort
Bridge
p = 0.03
% total
20
15
10
5
0
Total
100%
<100%
Basic research effort
Pilot
% total
25
20
15
10
5
0
Total
100%
<100%
Basic research effort



IDEAS FOR NEW FUNDING (DERIVED FROM THE SURVEY)

The faculty provided a remarkable array of ideas for new funding initiatives in support of basic-science research in the College (full list, Appendix 6). These ideas fall into four basic categories.

1. Enabling Faculty Success

Ideas include support for research teams (team-based collaborations on big health issues, provide pilot funding), creating an ideas incubator group, simplification of the compensation model for teaching, and dedicating space and funding to an exercise facility.

2. Facility and Program Innovations

Ideas include inaugurating a regenerative medicine program, providing funding for new cores, and improving the genomics facilities and support staff.

3. Administrative Changes

Ideas include increasing funds to departments to enhance research productivity and creating new basic-research positions (e.g. physicians in basic science departments and faculty converting to tenure track), consolidation of facilities across departments, and inaugurating a data-science department connected to groups outside the College.

4. Application of Outcomes

One idea is to develop better commercial and pharmaceutical links.

COMMENTS ON REALLOCATION OF FUNDS TO PAY FOR NEW IDEAS

Three themes were prominent in the comments on reallocation of funds.

1) The centers and cores
2) The new incentive program
3) The SWAT team

Several commented that a disproportionately high level of funding goes to the Centers given the value they provide for supporting basic-science research. Many of the

respondents felt that the new Faculty Incentive Program was unlikely to yield the desired increase in external funding, and felt that the funds could be better used in the other allocations. A similar sentiment about the newly implemented SWAT Team and grant preparation FTE funding was expressed by several respondents. Some alternate uses proposed included using these monies to defray costs of graduate students and technicians as well as enabling the hiring and support of new faculty doing basic-science research. There were also calls for increased transparency for the College budget related to basic research, particularly overhead/F&A.

MANAGEMENT-LEADERSHIP ISSUES (DERIVED FROM ISSUES REVIEW)

A small set of key management issues relating to basic-research productivity emerged in the committee's early discussions; faculty on the committee had an array of perspectives on these issues. Further discussion led the committee to identify three key issues to bring to the attention of the faculty at large in the survey. These results address the array of issues addressed by the Committee, the faculty's survey responses to questions the committee framed on the three issues considered most central to enhancing basic research productivity, and comments made at the faculty open forum.

The Committee's Issues

On representation of faculty effort and resultant funding. A key concern of committee members is realistic representation of the distribution of tenure-track faculty effort. Because faculty efforts for academic duties (teaching and service) are not adequately supported, departments are asking faculty to cover more and more of their salaries using direct grant dollars (anywhere from 60–90%). This increased expectation to use research funds to pay salaries is not always accompanied by reduced expectations for service and teaching effort, which limits the use of these funds to support research (e.g. laboratory staff) and places investigators at a competitive disadvantage for renewing grants or winning additional external funding. In a national context, expecting faculty to fund 60% or more of their effort from extramural grants in the current funding climate does not seem realistic.

Time spent serving on committees and teaching should be funded from the individual departments' budgets (or alternatively from the College) especially if the time spent is substantial, or the activity goes above and beyond one's job description. One example is support for developing a new course. Another example is support for research faculty who teach or serve on college or University-level committees. In considering reward for service efforts, it is important to remember that almost all service is voluntary.

The College contribution to basic-science department budgets has not changed substantially in 20 years, despite significant increases in the overall budget of the LCOM. A number thought that the problem lies with the implementation of the FTARRS system. FTARRS is designed to distribute a pool of money to departments based on teaching effort and research success, but it does not define what that starting pool should be. It appears that the pool starts off too small to cover all of the teaching and research efforts of the faculty adequately, leaving departments with a shortfall and no flexibility to make strategic investments in initiatives to grow areas of research or add new faculty. This

shortfall has led to increased expectations of faculty to attract extramural support.

The only way for a department to balance its budget is for grants to cover faculty effort in teaching and service, i.e., if a faculty member spends 50% of their time on research, but has to cover 70% of their effort with grants, that 20% difference constitutes funds that could support an additional graduate student, post-doctoral fellow, or technician. Reduction in research personnel leads to a loss of research productivity and hence ability to compete for new extramural funding.

Although most committee members identify a problem with the current representation of effort, some argue that faculty are all expected to contribute in many different areas—however, none suggested that grant dollars should subsidize time spent on service and teaching.

On alignment of expectations and performance evaluation. Some committee members felt that there is need across all faculty pathways for much clearer information on RPT expectations and process guidelines, but others argued that specific guidelines impair the attraction and retention of productive faculty with diverse contributions to the College mission. Though success in research is heavily weighted during the evaluation of promotion and reappointment packages for basic scientists, some felt that expected but unarticulated faculty activity presents a problem. Another potential problem is that the expectations, being geared toward tenure-track and clinical-track faculty leave research-track faculty with insufficient or conflicting messages about wise choices of activities. Inconsistency between and within departments on the timing of advancement of research faculty for promotion may also be an issue. Consideration of advancement for these faculty might better be decided at the LCOM level to ensure consistency and equality. However, others felt that the standards are pretty clear, that if there is an issue it is with communicating those standards or providing mentoring.

On the Faculty Teaching and Research Reward System (FTARRS) Most agreed that FTARRS is difficult to understand for many faculty. However, several had enough command of the FTARRS system to argue that it is working for research and teaching, but not for administrative (e.g. Course-Director), mentoring, and service roles or for time spent writing grants. Although the FTARRS system is supposed to provide funds to departments within the College to support faculty time for teaching and research, the system, as currently designed, may not be able to fully compensate for faculty time, leaving departments to ask faculty to cover as much salary as possible using direct grant dollars. In contrast, some faculty argued that FTARRS was just overhauled and is much better than it was before, that it works as is.

On a re-evaluation of cores A number of committee members felt that a survey of each of the Cores' users to determine if the Cores are meeting expectations is needed. Their key point is that some Cores make consistent and significant contributions to the research success of the College, whereas others do not. Low use relates to either (1) a Core offering outdated or overpriced services/technologies or (2) a Core serving only a small subset of investigators. Determining which Cores fall into these categories and evaluating whether continued support of them is an efficient use of funds emerged as important to the committee. Variables to consider in a new review of the Cores include expense,

number of users, quality of service, significance to faculty research productivity, and subsidy level. The need for updated equipment or services to keep our cores viable is not necessarily justified solely on use level. The committee felt that even if a Core does not have as much use as other Cores, its existence may be justified by its contribution to the scientific environment of the College—thus use alone is not a valid criterion for deciding level of support.

The Faculty's Input on Selected Issues

1. Given the College's increased expectation to use research funds to pay salaries, should there be a more realistic representation of the distribution of faculty effort, especially in service and teaching?

Most faculty were supportive of this statement (80 yes out of 91 total responses); many (41) offered comments related to the topic. Comments from faculty that specifically indicated zero effort devoted to basic research were excluded.

All but a few faculty understood the nature of the issue—the bulk of the comments focused on 1) the need for transparent expectations of time distribution and 2) both direct and accurate salary support of service and teaching by the College. A number of faculty commented that salaries need to be competitive, equitable, and consistent for basic scientists across the College. Whereas there is currently an approach to a quantitative metric to represent investment in teaching, by contrast there is a lack of college-level acknowledgment of time invested in service—the primary issue for most respondents. Some specifically noted that their service time is paid via other revenue sources. Particularly worrisome to respondents is the use of funded research time to support teaching and/or service.

Faculty also provided a number of potential avenues to address this issue. The solutions fall into three major action categories:

1. specifically support service and normalize service between basic researchers in different departments
2. support and incentivize basic research regardless of outcomes
3. limit the amount of faculty salary on research grants to a reasonable level

A few faculty also suggested that money be pulled from other sources or administrator salaries to support faculty service.

The committee wants to emphasize an issue that first emerged in the forum. The College hosts a large number of undergraduate research students each year in concert with the University's goal of direct involvement of undergraduates in research. However, undergraduate students are both a benefit and a cost to faculty—strong students contribute to lab productivity, but all students take time. Faculty at the forum expressed a need for appropriate recognition of the time invested in teaching these students. If the University and College value the mentoring of undergraduates, then some sort of incentive is in order.

2. Testing the assumption in question 1: should there be a College policy for setting expectations for level of grant-funding of salaries?

We grouped the responses to this question into three groups, relating to: clarity and parity, level of external funding expected, and representation of non-research expectations.

1. The expectation needs to be **clear, realistic and flexible** across departments.
    a. The majority of respondents voiced the need for clearly conveyed expectations for the percentage of faculty salary to be covered by extramural funds from the LCOM Dean's Office with flexibility applied at the department level.
    b. In addition, the extramural salary funding goals established by the LCOM need to represent the current funding climate.
    c. Because of the distinct missions of different departments and the specific attributes of individual faculty members, it was suggested that the expectations be flexible over time and tailored to the individual faculty member's situation.

2. The consensus was that the **expectation would be 50% of salary** from extramural sources. The consensus expectation among survey respondents was that 50% of salary be obtained through extramural sources, although there were suggestions that as much as 100% of LCOM faculty doing basic-science research member's salary be internally supported.

3. Other **non-research duties should be incorporated** in the balance of expectation (i.e. supported internally) to account for their value to the institution.
    a. The overarching message was that the College should not be using extramural salary support to fund investigator's efforts that are not directly related to the awarded grant.
    b. Assuming the objective of earning 50% of individual salary support through extramural funds, survey respondents suggested that the balance of salary support should come from the College in return for obligations to teaching, service, and effort exerted in seeking additional extramural support.

3. Should there be a new evaluation of support for each of the Core Facilities based on their relative utility to basic researchers?

Most of the respondents [80% (68/85)] agreed that there should be a new evaluation of the College's Core facilities, focused on their relative utility to basic researchers. Of the remaining 20%, 16% (14/85) felt that reevaluation was not necessary, and three respondents did not indicate a yes or no answer. The comments and suggestions related to this issue address five common themes.

1. Many respondents noted that assessment of the Cores is ongoing but expressed concerns about whether these assessments have resulted in positive changes to Core support.
2. Others suggested that a new evaluation of a Core's support should be based on the

number of grant applications, number of funded grants, and the number of publications averaged over a reasonable time frame.

3. Facility support for clinical researchers should also be considered in any new evaluation of the Cores as some Cores are used heavily by clinical researchers.
4. Several faculty felt that it would be beneficial to offer new services within existing Cores or inaugurate new Cores; they suggested that work contracted to facilities elsewhere should be reviewed during a reevaluation to identify new services required and needs for additional support of current Cores.
5. Although not directly related to evaluation of Core support, several respondents indicated that elimination of space charges for Core facilities would lower fees associated with facility usage levied on users, which would have a direct impact on faculty resources.

We learned at the faculty forum that the survey question relating to the Cores and Centers was confusing, because the listing was incomplete (compare list from survey at Appendix 4, p. 35 with full list of Cores, Appendix 7), and funding information for individual Centers was scant. Prominent was the concern that the Vermont Cancer Center was largely focused on functions that do not qualify as Core-facility activities relevant to basic research. In fact, it appears more appropriate to include the Advanced Genome Technologies Core, which serves a much larger population within the college (and across campus) than the VCC. In addition, our financial information on support by the College for the Cores was not partitioned into support for basic and clinical research.

Finally, a set of three specific funding variables stood out among those addressed by the faculty at the forum.

1. Among Cores, the **High Performance Computing Core** got the most attention by far at the Faculty Forum. There are no high-performance computers in LCOM—the problem is that LCOM is depending on the VACC, which does not meet LCOM faculty needs. Some thought that there may be an opportunity to partner with engineering/complex systems for technology and computing needs. Others argued that partnering across campus sounds great in theory but doesn't work well in practice.
2. **The Faculty Incentive Program** though heavily criticized by survey respondents, came across as important, but in need of restructuring, in the forum. Returning a percentage of indirect funds to PIs was popular as a means to this end, especially as the money can be used for infrastructure by the PI. The faculty argued that physician scientists should not be excluded from the Faculty Incentive Plan as they are now; the sentiment was that it should be available to everyone doing basic-science research. It was noted by several at the forum who are also on the Research Incentive Committee that this issue was being addressed.
3. The faculty at the forum wanted greater emphasis on the new initiative of **fostering research teams** in this report. More specifically, some faculty noted that resources were needed to support team science.

The Faculty's Responses to the Committee's Request for Additional Comments

These responses are provided in Appendix 8.

4. RECOMMENDATIONS FOR CHANGE IN CURRENT FUNDING

Here, we provide specific recommendations for reallocation and investment of new funds to increase Larner College of Medicine faculty success in winning extramural funding. These recommendations are our synthesis of the discussions in the Committee meetings and the comments made by College faculty, informed by the quantitative results from the survey. Concerns prominent in the faculty survey comments and committee discussion informed our choice of recommendations. In this place, ahead of the recommendations, we want to emphasize the two issues of paramount interest to the faculty.

First is the over-reliance on grant-funded salary paying for time spent on service and teaching.

Second is the importance of maintaining a critical mass of basic-research faculty.

Beyond these two paramount issues, there are key general sentiments. Faculty doing basic-science research support shifting existing investment towards doctoral programs, bridge funding, core support, and pilot funding and away from existing Centers, the Faculty Incentive Program, and the SWAT Teams. Support for this shift was generally consistent across faculty rank. Those more highly engaged in basic-science research supported bridge and pilot funding to a greater degree; they also supported reductions in investment in IT support and statistical and bioinformatics support. Thus, changes consistent with these outcomes to our activity are also prominent in the recommendations.

EIGHT KEY RECOMMENDATIONS FOR CHANGE IN MANAGEMENT AND BUDGETING

1. Maintain a critical mass of basic-research faculty.

There is deep concern about the rank-structure of the current faculty, which is heavily weighted towards full professors—so that the next generation is not in development in the College. To the faculty, there is urgent need for investment in new young faculty, the need to place the College in the best position to attract strong new faculty, the need for more cooperation in recruitments, the need to make sure that faculty salaries are competitive, and the need for creative approaches to hiring outside the current emphasis on multiple hires offered to attract new chairs to the College. The health of the faculty community and thus the ability of faculty mentors to provide the kind of support that will improve funding success is key. Methods for community-building should be sought as part of the support for basic research.

2. Increase salary support for time invested in teaching and service.

It is a widely held view by faculty that extramural research dollars are subsidizing their time invested in non-research activities including both teaching and service, thereby

reducing research productivity in the College. Thus, the committee recommends the development of an approach to the equitable support of salaries for all faculty doing basic-science research across the college. The goal of this approach is to enhance pursuit of research endeavors while meeting other responsibilities to the institution now too frequently supported from direct grant dollars. To do so, the College should develop clearer guidelines specifying expectations for faculty activity relating to teaching, service, and research roles, with specific policies for funding sources for each of these activities.

3. Redesign and expand support for Core Facilities based on IBB-relevant review of use and impact.

Core Facility support is the largest budget item invested with basic-science funding in mind, appropriately so given the large number of faculty in and outside the College for whom the Cores provide services. A new (or recast) review of core functions, developed in reference to IBB-model budgeting, is in order as a basis for redesign of budgetary support for the Cores. Key variables to consider in this review are level of use and impact on productivity of the basic science community as measured by grant applications, funded grants, publications, and other appropriate metrics. Particular attention to the impact of charges for space is needed; elimination of space charges for core facilities will reduce Core expenses, in turn helping individual PIs and their departments save money that can be used for basic-science research.

Investment of new funds in Cores for purchase of newer, state-of-the-art equipment and services should increase use and thus financial advantage, because the grant dollars that are being used to hire services elsewhere would stay in the College, ultimately supporting research.

The faculty at the forum also recommended that a committee be constituted to coordinate technology needs and funding; decision-making is currently too reactive, not proactive, and without leadership.

4. Shift funding from the College to departments that house basic research with the goal of providing flexibility and recruitment capability within the departments.

The quantitative data suggest that faculty value direct funding for research efforts over funding for centers or the Faculty Incentive Program. The argument is based on the premise that the departments can more readily turn the incentive funds into grants than can the College administration. These funds, managed at the Department level, can be used to support basic-science research by funding graduate students, postdoctoral fellows, and faculty salaries. Increased levels of departmental support for faculty salaries would also address the concern treated here as the basis for the recommendation that faculty are expected to subsidize their service and teaching time with research grants.

5. Increase support for graduate students and post-doctoral fellows.

Increased funding devoted to support of doctoral student stipends will lead to their longer tenure (ideally five years) enabling them to contribute to the research productivity of investigators, especially those with modest support. The same logic applies to increased

funding for postdoctoral fellows. Increased support for Ph.D. stipends will also help the College in the national competition for the best new students.

6. Make more dollars available to fund pilot projects.

New dollars or reallocation of current dollars should be used to identify and support new research foci or to help support current research foci in the College. For instance, funding initiatives focused on regenerative medicine, cardiovascular disease, and lung biology have a high potential to lead to new externally funded grants.

7. Reduce or discontinue investment in the Faculty Incentive Plan.

There was broad support for reducing funds allocated to the Faculty Incentive Program—it was the favorite target for reallocation to other existing funding lines or new funding initiatives. The respondents felt that the new incentive program was unlikely to yield the desired result, i.e. increased external funding or providing a meaningful increase to basic science faculty base salary.

8. Critically evaluate the money being spent on the Centers.

We recommend a review to determine whether the investment being made in the Centers supported by the College is yielding proportionate returns for the basic-science community. Funds designated to support centers are a large budget item assigned to only two centers. If Center support is important, then the College should clearly articulate the rationale for supporting only those centers and not other centers or other basic-science support mechanisms.

5. RECOMMENDATIONS FOR NEW INITIATIVES

Faculty doing basic-science research suggested consideration of a wide range of new funding initiatives, including support for team science, trainees, new cores, morale-boosting amenities, and mechanisms to better integrate private companies and private investment in the college. Again, a common suggestion was to shift College research-enhancement funds to departments. Among the specific new initiatives were to:

1. Hire and support new faculty doing basic-science research.
2. Provide funding for new cores such as for Crispr/cas 9, RNAi, and plasmid-prep technologies.
3. Increase College investment in cross-departmental infrastructure such as autoclaves, centrifuges, water filtration and distillation, and image developers.
4. Support the development of research teams
5. Increase fund-raising activities for basic science research.

6. ASSESSING IMPACT

Here, the Faculty Committee on the Optimal Environment for Basic Science Research provides a model for a collegial approach to assessing the impacts of the financial and management changes recommended in this report. Response to our survey included a call for increased transparency on College investment in basic research. We agree: an annual report to the College faculty should be inaugurated. It should comprise the following elements:

1. An update on the investment into each of the variable basic-science support categories, to include the amount invested and the change in percentages from previous years.
2. A summary of indicators of impact of the changes, including:
    a. Number of publications
    b. Grant funding (award totals and number of faculty funded)
    c. Ph.D.s granted and enrolled
    d. Funding environment

The report should also include a summary of the College's actions and an appropriate assessment of the progress on the eight key recommendations in this report. Finally, the report should include assessment of faculty morale and satisfaction with the basic science environment.

7. REFERENCES

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APPENDICES

APPENDIX 1 ORIGINAL CHARGE TO THE COMMITTEE

The University of Vermont
LARNER COLLEGE OF MEDICINE

Charge to the Faculty Committee on the Optimal Environment for Basic Science Research

January 30, 2017

As you know, this is a difficult time for basic science and laboratory investigators generally to successfully pursue their lines of inquiry. The College has launched a strategic planning initiative to address the support for basic science research in our college. Your role in this process is to advise on the optimal environment for basic science and laboratory investigators. Your experience in this field qualifies each of you, perhaps uniquely, to provide such advice.

The College provides support for basic science research in the form of the laboratories, equipment, startup funding, bridge funding, core laboratories, SPA, etc. It is also expanding that support by investments in FTE support for investigators preparing large multiple-individual grants and training grants, as well as in statistics and bioinformatics. We are looking for your feedback on whether these are the best forms of support, i.e., are some of these superfluous and are there some that are missing, and are there better ways to support our basic science investigators.

Here at UVM, like all academic institutions, total resources are constrained. Therefore, we are also asking you to prioritize the support mechanisms you recommend. Annually, the College spends $35.8M to support research, representing a 55% percent subsidy of the total external research funding. Could we spend this money in a better way to support our scientists? Some colleges of medicine produce more external research funding for the amount of money we're spending. Could we be more effective and efficient with the funds we are spending?

There is a separate committee of chairs of basic science departments and clinical departments that support basic scientists. They are charged with recommending the best academic structure to house our basic scientists, and how to sustainably fund that structure. Similar to this committee, they are charged with addressing how we could be more effective and efficient with a different structure or funding mechanism. Thus, both committees are charged to consider the optimal utilization of our current funds to support research. The subsequent question will consider the most effective ways to add additional resources to grow the research engine. However, we must first address how to use our current funds most effectively and efficiently, as that will help us understand where to invest additional funds.

APPENDIX 2 MEMBERS OF THE COMMITTEE

David S. Barrington, Ph.D., *Facilitator*, Professor of Plant Biology and Director, Pringle Herbarium, Interim Chair of the Plant Biology Department.

Beth Bouchard, Ph.D., Assistant Professor of Biochemistry—cellular and molecular mechanisms that regulate assembly and function of the enzyme complexes involved in blood coagulation

Chris Berger, Ph.D., Professor of Molecular Physiology and Biophysics, Director, Graduate Education—the interplay between post-translational modifications on both kinesin and tubulin in regulating axonal transport

Marilyn Cipolla, Ph.D., Professor of Neurological Sciences—how changes in cerebrovascular structure and function affect cerebral blood flow regulation and hemodynamics

Charles Irvin, Ph.D., Professor of Medicine and Associate Dean for Faculty Affairs

Nancy Jenny, Ph.D., Associate Professor of Pathology and Laboratory Medicine—how inflammatory and immune factors are associated with development and progression of aging-related diseases like atherosclerosis, dementia and frailty

Karen Lounsbury, Ph.D., Professor of Pharmacology—signaling through transcription factors during normal or pathological cell growth

Hugh Garavan, Ph.D., Professor of Psychiatry—cognitive control functions, those processes involved in monitoring, coordinating and adapting our behaviour so as to achieve our goals

Matthew Poynter, Ph.D., Professor of Medicine—influences of pulmonary innate and adaptive immunity on respiratory health

Brian Sprague, Ph.D., Associate Professor of Surgery—cancer epidemiology

Benjamin Suratt, MD, Professor of Medicine—role of innate immunity in the pathogenesis of critical illness

Jason Stumpff, Ph.D., Assistant Professor of Molecular Physiology and Biophysics—mechanisms that move and organize chromosomes during cell division and determine how these functions preserve genomic integrity

Matthew Wargo, Ph.D., Assistant Professor of Microbiology and Molecular Genetics—why is *Pseudomonas aeruginosa* such a successful pathogen in the mammalian lung?

APPENDIX 3 THE ORIGINAL SET OF VARIABLES ASSEMBLED BY THE COMMITTEE

Budgeted Investment	Amount	%	Kind	% Basic	Fixed (Y)	Notes
Unrecovered F&A for sponsored research	$5,700,000.00	22.3	ongoing	80	Y	FY13
Laboratory research space	$5,180,000.00	20.3	ongoing	90	N	157,184 sq ft at $32.94/sq ft
SPA	$2,710,000.00	10.6	ongoing	85	Y	65% of total SPA expense
equipment						included in startup funding. The COM did have a separate fund for shared equipment but that is no longer being funded.
cost sharing (both mandatory & voluntary committed)	$2,390,000.00	9.4	ongoing	85	Y	FY13
Start-up funding	$2,300,000.00	9.0	ongoing	90	N	
core facilities	$1,500,000.00	5.9	ongoing	90	N	includes Animal Care, Microscopy Imaging, 3T Magnet, Bioinformatics, IMF
investigator salaries above salary cap (Difference between actual investigator salaries committed to federal grants and the cap set by Congress on the direct salary charged to federal grants and contracts)	$1,030,000.00	4.0	ongoing	85	Y	Contracts in FY13

D. Faculty Incentive Program:	$1,000,000.00	3.9	renewable	85	N	investment in research bonus program for faculty; five year funding commitment of $1M
bridge funding and pilot-grants	$890,000.00	3.5	ongoing	85	N	reviewed by Michael Toth's committee
Support doctoral stipends and operational support for main LCOM doctoral programs	$810,000.00	3.2	ongoing	100	N	
B. Recruiting leadership and supporting personnel for Health Service Research	$500,000.00	2.0	one-time	0	N	five year funding commitment of $2.5M
C. joint recruitment with CEMS in basic science bioinformatics:	$500,000.00	2.0	one-time	100	Y	
B. new consulting service faculty (PhD and MS) in bioinformatics infrastructure	$400,000.00	1.6	renewable	85	N	five year funding commitment of $2M
A. Improve clinical research processes and policies:	$150,000.00	0.6	ongoing	0	N	for support staff for new central administration
Overruns	$130,000.00	0.5	ongoing	85	N	FY13
B. SWAT Team and Navigator:	$100,000.00	0.4	ongoing	85	N	new position
C. Bridge and Internal Grant Programs:	$100,000.00	0.4	ongoing	0	N	Additional funding for new targeted requests for proposals

A. additional FTE support	$100,000.00	0.4	ongoing	85	N	support up to 20 % of PI salary (NIH cap) for 2-3 months for PIs while writing training grants or other major institutional grant opportunities
Mentoring Program and Training Support	$40,000.00	0.2	ongoing	85	N	represents a 10% increase in FTE and Operating Expenses
D. competitive graduate student stipends	$10,000.00	0.0	ongoing	85	N	top-off supplement
FTE support for investigators preparing large multiple-individual grants and training grants						No current expense: see IV B below
statistics and bioinformatics						See core facilities support (above) and new investment (IV.B. below)
coverage of the gap when the faculty member does not meet the institutional expectation of the percent effort on grants.						not calculated because COM currently does not have an agreed-upon target for how much salary coverage should be maintained
TOTAL INVESTMENT	$25,540,000.00	100.0				

APPENDIX 4 SURVEY INSTRUMENT

Introduction and rationale for the Faculty Survey from the LCOM Committee on the Optimal Environment for Basic Science Research

We invite you to participate in a survey to determine your priorities for the financial support of Basic Science research provided by the Larner College of Medicine Dean's office. If you conduct basic research, we are depending on you to participate. If you do not perform basic science research, you should not participate.

The goals of the survey are:

1.) Obtain input to assess the prioritization of support for Basic Science that is in place **currently.**

2.) Obtain input on possible **new** categories of support for Basic Science.

3.) Get your input into other issues under discussion by LCOM Committee on the Optimal Environment for Basic Science Research.

The Committee appreciates that optimizing the environment for basic science research involves more than just redistributing funding. We appreciate input on policies, processes, and procedures that the faculty feels need improving. Thank you for your participation.

The committee:

Chair: David Barrington, Ph.D., Professor and Chair, Plant Biology Department

Beth Bouchard, Ph.D., Assistant Professor of Biochemistry

Charles Irvin, Ph.D., Professor of Medicine and Associate Dean for Faculty Affairs

Matthew Poynter, Ph.D., Professor of Medicine

Benjamin Suratt, MD, Professor of Medicine

Chris Berger, Ph.D., Professor of Molecular Physiology and Biophysics, Director, Graduate

Marilyn Cipolla, Ph.D., Professor of Neurological Sciences

Nancy Jenny, Ph.D., Associate Professor of Pathology and Laboratory Medicine

Julie Phillips, MD, Assistant Professor, Obstetrics, Gynecology and Reproductive Sciences

Karen Lounsbury, Ph.D., Professor of Pharmacology

Jason Stumpff, Ph.D., Assistant Professor of Molecular Physiology and Biophysics

Matthew Wargo, Ph.D., Assistant Professor of Microbiology and Molecular Genetics

Hugh Garavan, Ph.D., Professor of Psychiatry

Brian Sprague, Ph.D., Associate Professor of Surgery

Prioritization of Current Support

Below are the current categories of LCOM Dean's office funding in support of basic science research. The number in parentheses (e.g. 10%) is the current allocation as a percent of $7,200,000 for FY17.
The overall question for this section is: "How would you re-allocate this money?"

Note: fill in each box taking care not to exceed 100%.

Click on a category for more info:

Support for Core facilities (27%)	☐	%
Support for two Centers (18%)	☐	%
(1.065M for VCC and 2.211M for OHPR)		
Ph.D. faculty incentive program (14%)	☐	%
IT support (10%)	☐	%
Biostatistics and Bioinformatics consulting support (9%)	☐	%
Doctoral programs (includes student stipends) (8%)	☐	%
Bridge funding (6%)	☐	%
Pilot project funding (6%)	☐	%
FTE contribution for preparation of large grants (1%)	☐	%
(includes ongoing Training Grants)		
Grant preparation SWAT team (1%)	☐	%
TOTAL	☐	%*

* Do not exceed 100%

Better Funding to Support Basic Science

The overall question for this section is "What are your priorities if **new money** can be identified?" Below is one category of new support being considered. You also have an opportunity to describe up to two new programs meriting support. For each of the following, choose a priority, with 5 being highest, 1 being lowest.

1.) Eliminate space charges for cores. Highest 5 4 3 2 1 Lowest

2.) New initiative A: Highest 5 4 3 2 1 Lowest

Explanation of idea

3.) New initiative B: Highest 5 4 3 2 1 Lowest

Explanation of idea

current support levels you've chosen to fund the above new initiatives? Would you reduce the Yes No

If yes, what % would you reallocate to the new programs?

Comments:

Your Input on Issues identified by the Committee

1. Given the College's increased expectation to use research funds to pay salaries, should there be a more realistic **representation of the distribution of tenure-track faculty effort**, especially in service and teaching?

   Yes ○ No ○ Comment:

2. Testing the assumption above: should there be a review of College policy for setting expectations for **level of grant-funding of salaries**?

   Yes ○ No ○ Comment:

3. Should there be a new **evaluation of each of the Core Facilities*** based on their relative utility to basic researchers?
   *The core facilities are:
   Animal Care
   Biometry
   Medical Biostatistics
   Flow Cytometry
   Instrumentation and Modeling Facility
   3T Magnet
   Microscopy Imaging
   Transgenic Mouse
   VT Cancer Center (the molecular data functions)

   Yes ○ No ○ Comment:

Respondent Demographics

Tell us about yourself *

Faculty Track	Pull down	
Faculty Rank	Pull down	
% of your effort in research	0-100%	%
% of your research effort in Basic Science	0-100%	%

PS

- All responses will be held in strictest confidence and all responses will be anonymous in public documents.
- A faculty forum will be held to receive input on a draft report based on the work of the committee and the results of this survey.

Additional comments:

APPENDIX 5 SURVEY DATA –PERCENT INVESTMENTS, FACULTY RANK AND PATH, FACULTY INVOLVEMENT IN BASIC RESEARCH

Survey Timestamp	Support for Core Facilities (27%)	Support for two Centers (18 %) - 1.065M for Vermont Cancer Center and - 175K for Office of Health Promotion	PhD Faculty Incentive Program (14%)	IT Support (10%)	Biostatistics & Bioinformatics consulting support (9%)	Doctoral programs (includes PhD student stipends) (8%)
4/17/17 14:22						
4/17/17 14:23	27	15	7	10	6	9
4/17/17 14:32	30	15	10	10	10	9
4/17/17 14:40	26	18	12	12	10	8
4/17/17 14:41	30	0	0	0	5	59
4/17/17 14:42	10	18	19	3	9	8
4/17/17 14:42	32	25	10	5	5	10
4/17/17 14:42	27	15	12	10	9	11
4/17/17 14:54	5	5	60	5	5	10
4/17/17 14:58	26	17	15	9	10	9
4/17/17 15:04						
4/17/17 15:07	30	5	20	10	10	10
4/17/17 15:10	36	7	5	8	10	8
4/17/17 15:24	25	15	15	10	12	8
4/17/17 15:28	32	8	20	1	1	15
4/17/17 15:52	22	12	0	9	8	18
4/17/17 15:56	25	15	20	8	10	8
4/17/17 15:59						
4/17/17 16:15	37	3	5	10	10	10
4/17/17 16:21	10	10	25	20	5	20
4/17/17 16:22	28	15	5	10	10	10
4/17/17 16:36	35	0	0	10	13	20
4/17/17 16:50	40	20	0	10	20	10
4/17/17 17:19						
4/17/17 17:24	30	10	25	5	5	5
4/17/17 18:40	35	10	0	5	2	12
4/18/17 4:40	40	10	14	5	10	5
4/18/17 9:24	30	15	15	10	10	8
4/18/17 10:29	37	15	0	4	5	14
4/18/17 16:29						
4/18/17 21:12	25	15	14	12	12	8
4/18/17 21:44	25	10	15	10	10	13
4/19/17 13:42	33	4	0	12	9	20
4/19/17 17:33	35	15	0	5	5	20
4/20/17 9:41	27	14	14	10	9	8
4/20/17 9:42	40	10	25	5	5	5
4/20/17 9:50	35	20	0	10	9	8
4/20/17 9:52	20	13	15	10	5	15

Survey Timestamp	Support for Core Facilities (27%)	Support for two Centers (18%) - 1.065M for Vermont Cancer Center and - 175K for Office of Health Promotion	PhD Faculty Incentive Program (14%)	IT Support (10%)	Biostatistics & Bioinformatics consulting support (9%)	Doctoral programs (includes PhD student stipends) (8%)
4/20/17 10:27	27	10	22	10	5	12
4/20/17 10:27	25	18	13	8	10	9
4/20/17 10:58	30	20	10	5	10	8
4/20/17 11:12	30	10	10	10	15	5
4/20/17 11:29	0	0	20	5	0	8
4/20/17 11:44						
4/20/17 11:51	33	3	20	10	10	10
4/20/17 12:08	30	5	5	15	15	10
4/20/17 12:11	38	16	0	8	12	10
4/20/17 16:02	25	12	16	5	5	12
4/20/17 16:31	36	5	0	10	15	15
4/20/17 16:50	20	0	0	10	9	8
4/20/17 17:41	30	15	10	10	10	10
4/20/17 17:41	30	15	10	10	10	15
4/20/17 20:05						
4/21/17 11:01	36	12	0	10	15	8
4/21/17 11:09	29	20	14	8	5	10
4/21/17 15:16	30	15	12	5	5	15
4/21/17 15:22	30	18	0	8	11	20
4/21/17 16:13	37	9	10	5	9	16
4/23/17 9:36	40	9	10	10	5	10
4/23/17 12:34	28	5	14	10	8	12
4/24/17 9:19	30	12	14	10	12	8
4/24/17 9:21	27	15	14	10	8	6
4/24/17 9:26	27	18	14	10	9	8
4/24/17 9:36	25	15	14	10	10	15
4/24/17 9:36	22	12	20	10	5	10
4/24/17 9:47	35	8	20	8	5	7
4/24/17 9:57	27	10	14	10	9	8
4/24/17 9:57	35	15	10	10	10	5
4/24/17 9:58	30	10	10	10	12	8
4/24/17 10:08						
4/24/17 10:11	25	15	10	12	14	10
4/24/17 10:12	30	15	14	10	9	8
4/24/17 10:40	15	14	0	10	10	15
4/24/17 10:44	26	20	15	10	10	4
4/24/17 10:56	25	18	15	9	7	10
4/24/17 13:31	20	15	10	3	5	16
4/24/17 13:38	32	23	0	11	10	9
4/24/17 13:40	10	0	50	10	0	16
4/24/17 14:04	33	20	12	10	9	8
4/24/17 14:05	30	1	15	4	5	15
4/24/17 15:21	25	16	15	8	8	10
4/24/17 21:23	20	10	10	10	18	11
4/24/17 21:45	20	5	0	10	0	25
4/24/17 21:49	23	10	10	10	9	10
4/25/17 2:22	45	3	0	12	12	12

Survey Timestamp	Bridge funding (6%)	Pilot project funding (6%)	FTE contribution for preparation of large grants (1%) (includes ongoing Training Grants)	Grant preparation SWAT team (1%)	Total
4/17/17 14:22					
4/17/17 14:23	12	12	1	1	100
4/17/17 14:32	6	10	0	0	100
4/17/17 14:40	6	6	1	1	100
4/17/17 14:41	6	0	0	0	100
4/17/17 14:42	7	20	1	3	98
4/17/17 14:42	6	6	1	0	100
4/17/17 14:42	7	8	1	1	101
4/17/17 14:54	5	5	0	0	100
4/17/17 14:58	5	5	2	2	100
4/17/17 15:04					
4/17/17 15:07	10	0	3	2	100
4/17/17 15:10	10	15	1	0	100
4/17/17 15:24	6	6	1	2	100
4/17/17 15:28	8	10	4	1	100
4/17/17 15:52	15	15	1	0	100
4/17/17 15:56	6	6	1	1	100
4/17/17 15:59					
4/17/17 16:15	8	15	1	1	100
4/17/17 16:21	3	5	1	1	100
4/17/17 16:22	6	10	2	4	100
4/17/17 16:36	10	10	1	1	100
4/17/17 16:50	0	0			100
4/17/17 17:19					
4/17/17 17:24	10	10	0	0	100
4/17/17 18:40	16	20	0	0	100
4/18/17 4:40	7	7	1	1	100
4/18/17 9:24	5	6	1	0	100
4/18/17 10:29	12	12	1	0	100
4/18/17 16:29					
4/18/17 21:12	6	6	1	1	100
4/18/17 21:44	7	7	1	1	99
4/19/17 13:42	6	10	6	0	100
4/19/17 17:33	10	10	0	0	100
4/20/17 9:41	8	8	1	1	100
4/20/17 9:42	5	5	0	0	100
4/20/17 9:50	8	8	1	1	100
4/20/17 9:52	10	10	1	1	100

Survey Timestamp	Bridge funding (6%)	Pilot project funding (6%)	FTE contribution for preparation of large grants (1%) (includes ongoing Training Grants)	Grant preparation SWAT team (1%)	Total
4/20/17 10:27	6	6	1	1	100
4/20/17 10:27	7	7	2	1	100
4/20/17 10:58	5	10	1	1	100
4/20/17 11:12	9	9	1	1	100
4/20/17 11:29	6		1	0	40
4/20/17 11:44					
4/20/17 11:51	6	6	1	1	100
4/20/17 12:08	10	10	0	0	100
4/20/17 12:11	6	8	1	1	100
4/20/17 16:02	12	10	0	3	100
4/20/17 16:31	8	10	1	0	100
4/20/17 16:50	6	6	1	1	61
4/20/17 17:41	8	6	1	1	101
4/20/17 17:41	10	5	0	0	105
4/20/17 20:05					
4/21/17 11:01	10	8	1	0	100
4/21/17 11:09	6	6	1	1	100
4/21/17 15:16	8	8	1	1	100
4/21/17 15:22	6	6	1	0	100
4/21/17 16:13	6	6	1	1	100
4/23/17 9:36	0	10	3	3	100
4/23/17 12:34	14	8	0	0	99
4/24/17 9:19	6	6	1	1	100
4/24/17 9:21	9	9	1	1	100
4/24/17 9:26	6	7	1	1	101
4/24/17 9:36	5	5	1		100
4/24/17 9:36	12	6	1	2	100
4/24/17 9:47	9	6	1	1	100
4/24/17 9:57	6	6	5	5	100
4/24/17 9:57	5	10	0	0	100
4/24/17 9:58	7	8	3	2	100
4/24/17 10:08					
4/24/17 10:11	6	6	1	1	100
4/24/17 10:12	6	6	1	1	100
4/24/17 10:40	6	6			76
4/24/17 10:44	5	5	5	5	105
4/24/17 10:56	7	7	1	1	100
4/24/17 13:31	15	15	1	0	100
4/24/17 13:38	6	7	2	0	100
4/24/17 13:40	6	6	1	1	100
4/24/17 14:04	3	3	1	1	100
4/24/17 14:05	15	15	0	0	100
4/24/17 15:21	8	8	1	1	100
4/24/17 21:23	6	14	1	0	100
4/24/17 21:45	16	20	3	1	100
4/24/17 21:49	14	14			100
4/25/17 2:22	6	6	2	2	100

Faculty Pathway	Faculty Rank	% of your effort in research	% of your research effort in Basic Science
Clinical Scholar	Assistant Profes	0	0
Tenure	Professor	60	60
Research Schol	Associate Profe	95	95
Tenure	Professor	5	0
Tenure	Professor	85	100
Tenure	Professor	70	100
Tenure	Professor	95	50
Research Schol	Assistant Profes	95	100
Research Schol	Assistant Profes	100	0
Clinical Scholar	Assistant Profes	5	0
Tenure	Professor	100	100
Tenure	Associate Profe	100	100
Research Schol	Associate Profe	95	0
Research Schol	Assistant Profes	100	100
Research Schol	Assistant Profes	100	100
Clinical Scholar	Assistant Profes	0	0
Tenure	Professor	90	50
Tenure	Professor	30	30
Tenure	Professor	50	0
Research Schol	Associate Profe	70	0
Tenure	Professor	50	5
Tenure	Professor	85	10
Education Scho	Assistant Profes	25	9
Research Schol	Assistant Profes	100	100
Tenure	Associate Profe	60	100
Tenure	Professor	20	0
Tenure	Associate Profe	60	67
Research Schol	Assistant Profes	100	100
Research Schol	Assistant Profes	95	95
Clinical Practice	Professor	10	0
Tenure	Professor	85	40
Tenure	Assistant Profes	95	100
Tenure	Professor	1	100
Tenure	Professor	80	100
Research Schol	Associate Profe	98	98
Tenure	Professor	65	translational)

Faculty Pathway	Faculty Rank	% of your effort in research	% of your research effort in Basic Science
Research Schol	Associate Profe	100	100
Tenure	Assistant Profes	95	95
Clinical Scholar	Associate Profe	60	0
Research Schol	Assistant Profes	100	100
	Professor	100	100
Tenure	Professor	80%	50%
Research Schol	Assistant Profes	90	90
Tenure	Professor	20	1
Tenure	Professor	60	60
Research Schol	Assistant Profes	0	0
Research Schol	Faculty Scientis	100	100
Tenure	Professor	70	100
Tenure	Professor	2	100
Tenure	Professor		
Tenure	Professor	100%	clinical science
Research Schol	Faculty Scientis	80	50
Tenure	Associate Profe	45	100
Tenure	Associate Profe	55	100
Tenure	Professor	70	70
Tenure	Professor	50	10
Tenure	Professor	30	100
Tenure	Professor	70	25
Tenure	Professor	75	75
Tenure	Professor	65	60
Research Schol	Professor	70	65
Research Schol	Assistant Profes	100	100
Research Schol	Assistant Profes	95	95
Tenure	Professor	80%	10
Tenure	Professor	not be recovere	100%
Tenure	Assistant Profes	75-80	75
Clinical Scholar	Professor	20	10
Tenure	Associate Profe	~90	0
Tenure	Professor	60	60
Clinical Scholar	Assistant Profes	20	0
Research Schol	Faculty Scientis	100	100
Research Schol	Associate Profe	100	100
Tenure	Professor		
Tenure	Professor	50	50
Tenure	Professor	60	100
Tenure	Associate Profe	85	65
Clinical Practice	Assistant Profes	0	0
Tenure	Professor		100
Tenure	Professor		100
Research Schol	Assistant Profes	100	100

APPENDIX 6 FACULTY IDEAS FOR NEW INVESTMENTS

Low cost proposals

Idea Categories	Comments Summary
Consolidation of departmental services	Explore consolidation of administrative staff and academic leadership across departments; consider core autoclaves, water filtration and image developers (expensive to maintain and duplicated across LCOM)
Revamp the teaching system	Better utilize current faculty in teaching new courses; simplify compensation for teaching

Moderate cost proposals

Increasing research activity

Idea Categories	Comments Summary
Support for physician scientists to do basic science	Support physician scientist joint appointments in basic science departments
Develop new pilot project program	Develop pilot project program linking unfunded investigators with funded investigators
Increase departmental discretionary funds	Increase funds for departments to use as needed for research activities/graduate students/etc.; use new research incentive funds to increase departmental funds. Faculty are our greatest resource and a fixed percentage of their effort (25%) should be covered to compensate for their efforts in teaching and service as these efforts are under-funded or not funded and often covered by grants.
Develop team-based programs	Encourage faculty to work together to maximize joint resources; discourage individual programs that do not fit into team-based structure; Create a collaborative, interdisciplinary team of investigators that will participate in a targeted award mechanisms at NIH or foundations. Create a core group of investigators addressing a big health issue (asthma, pain management, drug abuse, lung injury, regenerative medicine, obesity associated diseases, etc.). Provide money to generate preliminary data. The 'SWAT' team will facilitate interchange of collaborative ideas, identifying grant mechanisms, following up with a time bound submission and keeping the track of final outcome.

Improvements to existing activities

Improve graduate program	Increase support for graduate students and provide support for 5 years, particularly for graduate students to work with early career research faculty; support for MD

	students to do research; increase graduate student recruitment; provide travel awards.
Improve postdoctoral support	Provide health and dental insurance and other benefits; provide travel awards; fellowships
Merge vaccine testing and basic science	Increase collaboration between vaccine testing center and basic scientists
Increase bridge funds	More salary support for scientists who cover large percentages of their salaries from grant funding. A cutoff NIH priority score should be fixed to provide bridge support.
Increase fund raising	Fund raising for basic science from private donors and alumni
Improve sponsored programs responsiveness	Improve efficiency and focus before and after funding. Need well trained specialists. Need additional support after funding in the management/administration of funds.
Eliminate space charges for investigators	Use 5% of budget to reduce/eliminate space charges for investigators

Equipment / facilities / cores

Develop MRI research program	Develop collaboration with Montreal group
Increase genomic research	
Equipment repair	Support for repairing older equipment no longer covered by service contracts
Increase support for core facilities; create new cores	Enhance effectiveness and function of core facilities. Hire highly trained technical staff to perform core services. Given the advances through Crispr/Cas/RNAi and plasmid-prep technologies a (new) core would facilitate a lot of cutting-edge research in the college. Not having the possibility to make such models may soon impair the COM's competitiveness when applying for research grants. Alternatively, a collaboration with another institute or, at least, preferred rates with a commercial vendor could be established and partially subsidized by the College.

Misc

Facilitate faculty converting from research track to tenure track	Create cost sharing mechanism to support meritorious research track faculty switching to tenure track – 3% of budget; promote tenure appointments for physician-scientists

High cost proposals

Idea Categories	Comments Summary

Create new data science department	Offer opportunities for basic scientists to learn bioinformatics and build data science infrastructure; build high performance computer cluster for big biomedical data
Incorporate commercial/pharmaceutical companies into LCOM structure; create a research park to develop and refine new venture products/treatments	Many researchers already work with commercial entities; create structure to have these companies pay for space, research, etc. Research park needs state-of-the art instrumentation and facilities.
Create exercise facility in LCOM	Create an exercise facility for LCOM in Given/MedEd/HSRF area
Develop cross-campus program in regenerative medicine	Include industry MS program in basic medical science (thesis required)
Create an ideas incubator group	Create a group to collect and integrate ideas from departments/programs across campus (engineering, mathematics, complex systems, biomed science, chemistry, physics, etc.) to generate new products, treatments, translational ventures to feed into research park venue

APPENDIX 7: FULL LIST OF CORES WITH DATA PROVIDED TO THE COMMITTEE BY THE COLLEGE

Core (those included in the Faculty survey are in italic)	**Service**	**Funding Model**	**Total Subsidy**	**Space Subsidy Portion @ 60% of cost**
TOTAL LCOM FY17 CORE BUDGET is $1.5M				
Animal Resources				
Animal Care Management	Basic and clinical		$300,000.00	
BSL-3 Lab	Basic and clinical			
Inhalation Facility	Basic and clinical			
Transgenic Mouse Facility	Basic	I/E	$8,905.00	$740.00
Bioinformatics and Biostatistics				
Bioinformatics Molecular [Biometry?]	Basic	I/E	$8,040.00	$8,040.00
Biostatistics [Med Biostats]	Mostly clinical	GF	$136,525.00	
Genotyping and Molecular Phenotyping				
Advanced Genomic Technology Core	Basic			
Flow Cytometry and Cell Sorting Core	Basic	I/E	$144,841.00	$11,152.00
Laboratory for Clinical Biochemistry Research	Clinical			
NCOBRE Cellular and Molecular Biology	Basic			
Proteomics Core	Basic			
Stem Cell Core	Basic			
High Performance Computing				
Vermont Advanced Computing	Basic and clinical			
Instrumentation				
Instrumentation and Modeling Facility	Basic and clinical	GF	$140,000.00	
Mass Spectrometry	Basic			
Molecular, Cellular, and Clinical Biomedical Imaging				
Cryo-EM facility	Basic			

Microscopy Imaging Center	Basic	I/E	$423,256.00	$94,554.00
MRI Center for Medical Imaging [3T magnet]	Basic and clinical	I/E	$386,626.00	
Neuroscience Center Imaging and Physiology	Basic and clinical			
X-Ray Crystallography	Basic			
Outreach Education				
Vermont Genetics Network Outreach Core	Basic and clinical			
Physiology				
Bionutrition	Clinical			
Human Physiology Lab	Basic and clinical			
Vermont Cancer Center				
DNA, MDT, and MPS	Basic		$113,084.00	$65,352.00

APPENDIX 8 – ADDITIONAL COMMENTS INCLUDED IN THE SURVEY RESPONSES

- While I believe that this survey is well intentioned, there are number of major flaws in the COM that are not being examined here. In particular, this survey operates on the premise that finding the magic formula to divide up 7 million dollars ostensibly devoted to research will solve all of the problems. Money is certainly important, but it is not the whole story. A lot of the issues relate to demoralized personnel, leadership deficits, an utter lack of financial transparency, and exponentially rising expectations in the face of precipitously dwindling resources. Yes, you can wait for the current generation to retire and downsize your way to financial solvency. But will it still be an Academic Medical Center?
- We also need to get away from using grant support for salary as the metric for % effort on research. After all, many currently unfunded faculty spend a tremendous amount of time on research, which includes grant preparation, generation of preliminary data, etc. Another reason why support for pilot projects, bridge funding, and stipend support for grad students is so critical.
- VCC is overfunded relative to the rest of basic science OHPR funding should NOT be coming out of basic research budget; this is clearly clinical research
- There should be a discussion of the decision of the overall investment in basic research as in why the number is ~$7.2M and not higher. There are distinct choices as to the overall investments within the COM.
- The most important action is to find some way to financially reward the faculty member each time he/she obtains a grant. Hard to motivate research when there is no merit-based incentives.
- The charges for core facility space need to be incorporated into the Indirect Cost rate.

- Please be sure to adequately recognize and support excellent TEACHERs of basic science and not demand our best teaching faculty to spend their energy and efforts in an increasingly grim grant cycle while students learning suffers.
- I wish that Research Faculty, which has been funded for many years will not be treated with disadvantage in the times, when support is drying out.
- I really have no idea how funding for basic research is allocated, so could not answer this survey. I'm not sure why it was sent to me.
- Do something meaningful or research will die a slow death. Look at the number of R01s UVM is awarded and compare to other Universities. You will get a real shock! Why is UVM doing so bad to get federal money or any research money despite having all the amazing core facilities? There are few individual super stars but overall there is clear lack of collaborative efforts with a trans-disciplinary approach. There is a clear need to bridge the intellectual gaps and lack of communications among researchers.
- Basic research is not a for-profit organization. Basic research costs money, it always has. Basic research is under siege from all aspects of society and politics today. At the very least, our college should give its best to truly support our research endeavors. A million here and there isn't going to cut it. Our COM will become a trade school if the current leadership does not committ a bold and sustained support for research.
- Basic research can't be sustained here at the present level of support from the COM

- As this process has gone forward, I briefly thought that it might be feasible or good to combine clinical and basic science departments. I have now processed the full weight of the condescension/distain clinicians have for the basic sciences and think that this is not going to work. Further, I had thought that combining basic science departments might be a good idea. I no longer think that is true. What needs to happen is a disruption of the current power structure in some basic science departments and a realigning of faculty according to areas of interest and expertise. Further, I think that scientists in clinical departments need to be rescued from their abusive situations and allowed to transfer—with tenure—if it applies to the resulting basic science departments.
- As a new tenure-tracked faculty hire I chose UVM due to its track record of success in doing the type of research I'm doing and the quality of my colleagues. I opted not to take a position at a larger institution because I felt that my science could flourish in this environment and I could be internationally competitive. During the interview process I learned that all institutions were going through the same economic pains. UVM is a small institution with great people which allows for much transparency and unique solutions. Being said, I think many of the issues we are faced with are due to a lack of financial transparency and consistent understanding of expectations. Once these expectations are understood and long-term goals for our future are established, the basic science faculty will be able to move forward in a productive manner. If the University does not see itself engaging in top flight basic science research in the long term future, that should be made clear to the faculty. If the University does see value in this type of research, the University should start asking faculty what is need to make them successful and invest in its long-term future.
- also need to re-think MMG as a whole

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