

## RESEARCH FACULTY RETREAT - 2006

### WORKING GROUP #6

#### ***EVALUATION OF GRADUATE AND POSTDOC PROGRAMS AND THE ROLE THESE PROGRAMS HAVE IN THE RESEARCH COMMUNITY***

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#### **Focus:**

The focus of the group was to examine current graduate student programs with regard to costs and benefits to the medical school's research mission. We also examined success rates of the programs in attracting bright and motivated individuals and producing highly trained future independent investigators. The role of postdoctoral fellows was also examined.

#### **Findings:**

There was unanimous opinion that as with other research medical centers; graduate students are responsible for a large part of the research enterprise of the medical school. These students are also part of the education mission of the school. Nonetheless, the number of graduate students at WFUSM is 50% of that at comparable area institutions, despite the number of faculty being similar between the various institutions (Table 1). While our graduate student programs are small, the number of postdoctoral fellows is dramatically smaller. The effects of our low number of graduate students and postdoctoral fellows is also reflected in the lower number of research grants, training grants and fellowships that WFUSM receives as compared to comparable area institutions (Table 3). If WFUSM wishes to maintain and possibly increase its research mission and garner more extramural support, both graduate student (MD/PhD and PhD) and postdoctoral programs must be enlarged and enhanced.

#### **Recommendations:**

- Establish institutional funding and fundraising strategies to enable WFUSM to increase the size and quality of both the graduate student (MD/PhD and PhD) and the postdoctoral programs.
- Create an Associate Dean for Graduate Studies in the Medical School that will work in the Graduate School with the Dean for the Graduate School to oversee graduate programs specific to the Medical School's Research Mission such as
  - Developing innovative additions (e.g., specific translational projects, clinical exposure) to existing graduate programs that will attract motivated and talented individuals. These programs should include postdoctoral positions.
- Establish an Office of Postdoctoral Education with oversight at the Associate Dean level.

- Develop mechanisms to enhance the visibility and attractiveness of these training programs in order to recruit and retain top-tier students.
  - Create a position in the Graduate School (1.0 FTE) dedicated to centralizing the marketing efforts for all Medical School associated graduate programs. This individual will work with the Public Relations and Marketing Department. More importantly, this individual will work with information services to improve websites for the Graduate School and individual programs.
  - Designate someone in the Office of Development who will be dedicated to developing fundraising strategies for all Medical School associated graduate programs. This individual will work with the appropriate individuals in the Graduate School.
- Establish workshops for NRSA proposals (pre- and post-doctoral).
- Put teams of faculty together to write T32 proposals (interdisciplinary training grants).

**Report:**

***The role of graduate students and postdocs is essential to the research enterprise.***

The committee universally felt that the graduate students and postdocs were the engine of the research enterprise at the Medical School. To determine if this sentiment was indeed true, we evaluated the value of graduate students in terms of their contributions to the medical school. More precisely, we examined the costs to the institution for the graduate student programs and graduate student contributions to faculty research grants and publications. When possible, we also evaluated how our graduate school and programs compared to similar institutions (private medical schools in the southeast: Emory, Duke and Vanderbilt).

We also performed an analysis of individual PhD graduate programs. The results of this analysis are presented in the appendix.

Dr. Susan Hutson and Ms. Vicky Zickmund, on behalf of the Research Advisory Committee (RAC), recently completed an analysis of postdoctoral training at the medical school for the Research Advisory Committee. The report has been supported and endorsed by the RAC. The post-doctoral workgroup compliments our findings from the graduate programs and their report is included as part of this one.

***The state of our graduate student programs:***

- There are currently 235 students enrolled in the PhD programs.
- There are 12 MD/PhD students
- We have 298 graduate faculty.
- Stipend: \$20,772; fringe \$1800
- Tuition: \$24, 475 (all fifth year students and above register thesis only)

**Stipend support:**

- 35% are on faculty research grants
- 29% are on graduate school stipends
- 25% are on training grants or individual fellowships
- 6% are on basic dollar (department funds or faculty start-up)
- 5% are in the clinical training portion of the MD/PhD program

***Contributions of graduate students and postdoctoral fellows to the research mission:***

Both graduate students and postdoctoral fellows are highly motivated to pursue research projects. The work on an individual project benefits not only the PI, but also the student as it serves as part of the education and training for the individual. Students and postdocs contribute intellectually and practically to our research projects. 26% of faculty publications include a student that they have mentored, and 23% include a postdoctoral fellow. For the basic science faculty, graduate student and postdoctoral contributions are more critical as evident by 33% of publication include a graduate student and 27% include a postdoc. There is a practical aspect to having graduate students participate in research projects. On average, new graduate student skills are comparable to that of a Lab Tech II position. Currently, the minimum salary for a Lab Tech II with a BS and right out of school is \$29,952 (+25-30% fringe) and with 10-12 years experience the salary increase to \$37,440 (+25-30% fringe). Thus, fiscally, it is approximately 43% more expensive to hire a Lab Tech II than a graduate student. Practically, the contribution of the graduate student to publications and presentations at national meetings makes the investment even greater.

***Strengths:***

Graduate students are the major workforce for research projects in many departments, especially the basic science departments. As mentioned above, this has proven highly advantageous on many fronts.

After completing graduate school, our students do well in job placements. As shown in the Program Tables in the Appendix, a higher percentage of our PhD awardees hold faculty positions or other science related positions as compared to those from Duke University.

We can pioneer new and innovative programs. We were the first in the country to have a PhD/MBA program. Similar programs have since been started at other institutions.

The Graduate School is a critical component of Wake Forest University because by its nature it serves to integrate all schools within the University.

***Weaknesses:***

Extremely Small and Undeveloped MD/PhD Program: As shown in Table 1, we have an extremely small MD/PhD program. As such this is a non-competitive program. This is a serious concern because it portrays the Medical School as not being serious about its research mission to potential graduate and medical students. Additionally, this view can also be shared by funding agencies. Specifically, NIH is requesting more translational research, and MD/PhD candidates are a strong position to carry out this type of research.

At the current time the institution supports 2 slots each year for the MD/PhD program. Admittedly, this is an expensive endeavor, but that the MD/PhD program is an important part of our educational AND research mission. As an initial start, the program would be significantly enhanced with 4 slots each year. The negative impact of the small size of our program was felt this year. Although we were able to bring in 2 exceptional students, we lost our 2 top picks to other institutions. When the top two recruits were questioned, both of them replied that they opted for larger programs (Alabama and UNC). We lost another recruit from the wait list to Alabama as well. Applicants found that the larger programs offered more opportunities and a larger community of MD/PhD students. Both of these programs (as well as the ones listed in Table 1) have federal funds under the MSTP (medical scientist training program). We are not eligible, nor competitive for this type of funding. In order to be competitive we will need to have a longer track record (we have only graduated 4 students so far) and a more established program.

Distribution of programs across numerous campuses: Recruitment is designed for all graduate students, but once they matriculate, they typically remain on one campus. Graduate programs are located on the Hawthorne campus, Reynolda campus, Downtown campus, Friedberg campus, Biotech campus and Virginia Tech. This makes it extremely difficult to provide students with an integrated, cohesive graduate school.

Size of programs: Our graduate programs are very small. As shown in the appendix (Table 1), the number of entering graduate students is substantially lower at WFU than at Duke, Emory or Vanderbilt. The larger number of students is a direct reflection of the investment of the University into first (and in many cases second) year stipends.

Monitoring student progress: Across graduate programs, there is considerable variation in the mechanisms to evaluate students and to monitor progress of students. Furthermore, there is no unified format or timeline for moving to candidacy and ultimately to defending a dissertation.

Low number and quality of postdoctoral fellows: A recent report submitted to the Research Advisory Committee (RAC) highlights the deficiencies and proposes several recommendations to alleviate this problem (included in the Appendix). This report clearly indicates that we have few postdoctoral fellows. Furthermore, our ability to recruit postdoctoral fellows is weak and there is no coordination by the institution to assist faculty in recruiting. Furthermore, once a postdoc arrives here, there is no uniform career development program.

***Opportunities and recommendations:***

Distribution of programs across four campuses: At present, the Dean and Associate Dean of the Graduate School oversee all graduate programs and divide their time between the Reynolda campus and the medical school campuses (Hawthorne, Downtown, Biotech and Friedberg). We recommend that this system continue for the Dean (i.e., one Dean for the Graduate School), but have two Associate Deans, one for the Reynolda campus and one for the Medical School campuses. Both Associate Deans will report to the Graduate School Dean. The Working Group feels that such a scenario would be advantageous for medical school faculty who train graduate students and postdoctoral fellows.

The Working Group also encourages the creation of a Dean's Standing Committee on Graduate Student and Postdoctoral Training. This committee will advise both the Dean of the Medical School and the Dean of the Graduate School. The committee will be composed of Associate Dean for Biomedical Research Programs, Program Directors, individual faculty members, and student and postdoc representatives. This committee will serve to monitor overall student progress, program success and work to develop new mechanisms of funding and recruitment. This committee will also serve to identify and develop cross-disciplinary training programs that would serve as the foundation for new training grant applications.

Enhance and Increase size of Existing Programs: The Graduate School budget suffers because of tuition costs that have limited funding sources. We recommend a thorough examination and evaluation of the current funding and tuition costs. We also recommend that tuition costs be waived after the student passes their qualifying examination and becomes a doctoral candidate. The money that is currently in the budget to cover tuition costs for senior students would be used to develop better advertising and recruitment techniques for students and postdocs. Improving recruitment was the focus of a recent committee formed by Dr. Melson.

Based on the comparison with Duke, we do not attract the best students if you compare GRE scores and in most cases GPA. According to Table 1, our stipend level is less than the other

three schools. The Working Group suggests an increase in the graduate student stipend, as one important step that WFUSM can take to enhance recruitment. This is especially necessary since our students have to pay part of their health care and the costs doubled this year.

In order to attract more talented and motivated students, new, innovative components to existing programs should be created (or better publicized). Recommendations are to establish/enhance:

- Translational approaches that involve collaborative projects between clinicians and basic scientists.
- Primate research
- Bioterrorism projects
- Cancer center
- International collaborative training programs

Monitoring student progress: The Graduate School must mandate that all programs establish a “student evaluation committee” to monitor student progress. This committee will serve to advise and oversee the progress of new students until they choose a dissertation mentor and lab. After this, on a yearly basis, the committee will monitor student progress by review of transcripts and written progress reports from the student’s advisor. The committee will also serve to help enforce that qualifying exams are taken by the end of the second year.

Enhance the MD/PhD program: All major research medical centers have substantially larger MD/PhD programs. This program must be increased at the medical center.

Increase the number of postdoctoral fellows and enhance their career development: During the past decade, studies by the National Academy of Sciences, the Pew Charitable Trust and other organizations have established the need for well-defined postdoctoral training programs. Due to the limited numbers of such programs and the generally poor quality of postdoctoral training, the most rapidly growing portion of the job market for postdoctoral fellows is non-tenure track academic appointments that are solely dependent on extramural funds. An increasing number of departments and institutions have responded by developing strong, highly organized postdoctoral training programs. It is therefore proposed that the institution establish a formal postdoctoral career development program. All postdoctoral appointees will be invited to participate. Keeping in mind that these individuals are no longer students, the program will be specific for postdoctoral fellows and will focus on the tools needed for a successful career in science.

Conduct an evaluation of current graduate training programs: A National Research Council review of individual graduate programs at WFUSM in relation to all others in the country will be completed this fall and the results released next year. The results of this report provide an opportunity to evaluate and develop strategies to improve the graduate program at WFUSM. Using these data and other data compiled by the graduate school (internal review), we recommend conducting an external review of our Graduate School and Training Programs before the new dean comes on board. The review can be used in the recruitment of the new dean and as a guide for the new dean.

***Threats to the Research Mission:***

***Internal:***

As graduate students are the engine behind our research enterprise, decreases in number and quality of students jeopardizes our ability to seek extramural support.

Training outstanding graduate students allows them to go into labs at other institutions where they indirectly can recruit new students and postdocs to come to WFUSM. With increased postdocs the research environment expands and the ability to attract new graduate students improves.

Without strong graduate student and postdoctoral programs, the research reputation of the medical school is tarnished and our ability to compete for the limited resources at NIH and other extramural sources is hampered.

External:

Decreased NIH budget.

Increased attractiveness of European Schools

Rise in demands on clinicians to obtain clinical revenue inhibits their ability to participate in research activities and graduate student/postdoctoral training.

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**Table 1.** Comparison of Private Research Medical Centers in the Southeast:

	<b>Applicants/year</b>	<b>PhD students</b>	<b>MD/PhD students</b>	<b>Faculty</b>	<b>Stipend/ tuition</b>
WFUSM	470	235	12	298	\$20,772/ \$24,475
Emory	767	400	26	309	\$23,500/ \$29,800
Vanderbilt	381 (US)	509	87	197	\$24,000/ \$1200/ credit hour
Duke	985	514	79	262	\$23,000/ \$34,202

**Tuition**

WFUSM: paid by graduate school- years 1-4

Emory: paid by graduate school

Vanderbilt: paid by program (80% waived); training grant or PI grant (100% waived)

Duke: tuition is paid from fellowship, training grant or graduate school funds. Tuition is waived after the third year.

**Table 2.** Stipend sources:

source	WFUSM	Emory	Vanderbilt	Duke
Graduate school	28.9% (this includes all first year students)	Graduate school or training grant for years 1 and 2.	All first year students	Training grant for years 1 and 2
Training grant/ Fellowship	25.1%	Years 3+	60-70%	Years 3 +
Faculty research Grant	28.9%	Faculty research grants	20-30% 5-10% TA fellowships	Graduate school fellowship, research grant or individual fellowship

**Table 3.** NIH Funding

	<b>2004 NIH ranking</b>	<b>research grants</b>	<b>training grants</b>	<b>fellowships</b>
WFUSM	32	221	14	12
Emory	19	410	17	38
Vanderbilt	15	488	37	25
Duke	6	586	30	36

## Appendix 1

### Research Advisory Committee - Post Doc Subcommittee Final Report June 2006

#### Summary

The Research Advisory Committee (RAC) charged a subcommittee (consisting of faculty, staff, and postdocs) in September 2005 to formulate recommendations regarding postdoctoral fellows, recognizing their critical role in the research enterprise. The subcommittee reviewed recommendations from 2002, human resources policies and options, pertinent articles, related policies/procedures at other academic institutions, and engaged the postdocs in the process. Since the 2002 recommendations, the Graduate School, under Dr. Gordon Melson's leadership, provided some support to the postdoctoral students at WFUSM resulting in the formation of the postdoctoral association as well as a website. Although these steps forward were part of the 2002 recommendations, many recommendations were not implemented. The research environment, both within and outside WFUSM, is changing rapidly and recruiting and retaining postdoctoral fellows is critical to the continued success of the research enterprise. Therefore, the RAC subcommittee re-examined the postdoctoral experience at WFUSM and formulated the following recommendations:

- Establish an Office of Postdoctoral Education,
- Designate a Faculty Leader,
- Enhance and Maintain the postdoctoral association's website (<http://www2.wfubmc.edu/postdoc>), and
- Establish a Postdoc Steering Committee

Approving the recommendations provides significant steps to enhance the quality, quantity, and education experience of postdoctoral students at WFUSM and these increased efforts will assist in furthering the realization of the institution's research goals and priorities.

### **Reaffirmation of critical recommendations from 2002**

In 2002, a faculty committee, under Dr. Gordon Melson's leadership and as part of the then existing Medical Center strategic planning process, forwarded recommendations to the Medical School Dean regarding postdoctoral fellows. The 2002 faculty committee stated that *postdoctoral fellows are important contributors to enhancing and sustaining the research mission at the Medical Center* and that there is *opportunity for growth in the quantity and quality of this population of scientists who will assist the institution in achieving its goal of increased research effort*. The faculty committee made the following key recommendations to further enhance the recruitment and training of the postdoctoral fellows at WFUSM

- Establish an Office of Postdoctoral Education at WFU School of Medicine with administrative oversight at the Associate Dean or Director level. The Office will coordinate and enhance recruiting efforts in support of institutional training grants and individual researchers, coordinate education and training opportunities, establish a census database of current postdoctoral fellows and develop a policy statement for the rights and responsibilities of the postdoctoral researcher
- Create a website for the postdoctoral fellows/students to publicize the opportunities for postdoctoral education and research at the WFU School of Medicine. This site would increase and enhance the external visibility of the institution in the highly competitive arena of postdoctoral fellow recruitment and as well as contribute to increasing the academic reputation of the institution

The 2005/6 RAC Subcommittee continues to see these recommendations as pertinent.

### **Description of 2005/06 Recommendations**

*Establish an Office of Postdoctoral Education (estimated cost: \$10,000 -\$20,000)*

An Office of Postdoctoral Education at WFUSM provides many benefits to the institution and postdoctoral students, resulting in better quality postdocs and furtherance of the institution's research agenda. The responsibilities of the Office will include

- Maintain a central database listing all postdoctoral fellows and provide central and coordinated contact information.
- Enhance the visibility and functionality of the current website detailing the items noted below, as well as develop and maintain appropriate documents
  - Policies related to employment, compensation, benefits, and visas
  - Rights, Responsibilities, Expectations of postdoctoral students and mentors
  - Grant opportunities
  - Appointment process
  - Dispute resolution
  - Community resources
- Easily accessible website serves as a mechanism to improve recruiting and internal communication with and among postdoctoral students at WFUSM.
- Offer a routine orientation session for new postdoctoral fellows similar in to the new faculty orientation but specific to the research environment, facilities, educational opportunities, etc.
- Assist in recruiting quality applicants by the coordination of advertisements for available positions in the national print, electronic media, and website(s).
- Develop a postdoctoral career development workshop series, thus providing evidence of institutional commitment to career development. The series could include topics such as ethical conduct of research, scientific writing/grant writing, building curriculum vitae, understanding regulatory committees such as animal care and use/institutional review board, non-traditional scientific career paths, effective oral presentations, conflict resolution, negotiating a job, and others.

- Provide credential verification for potential postdoctoral fellows and assist in the recruiting and interviewing of international applicants; serve as a liaison between the institutional visa office, international applicants, and prospective mentors.
- Facilitate an annual speaker visit

A search of institution web sites indicates that a significant number of research intensive medical schools nationally and in our region have an Office of Postdoctoral Education.

<b>Schools with Postdoctoral Training and Education Offices</b>		
<b>SCHOOL</b>	<b>NIH RANK (FFY 2004)</b>	<b>OFFICE NAME</b>
Johns Hopkins University	1	Office of Postdoctoral Programs
University of Pennsylvania	2	Biomedical Postdoctoral Program
Duke University	6	Office of Postdoctoral Services
University of California at Los Angeles	8	UCLA Graduate Division
Stanford University	10	Office of Postdoctoral Services
Baylor University	11	PostDoc Association of Baylor
Vanderbilt University	15	Office of Biomedical Research, Education, and Training/Office of Postdoctoral Affairs
University of North Carolina - Chapel Hill	17	Office of Postdoctoral Services
Univ. Alabama Birmingham	18	Office of Postdoctoral Education
Emory Univ. School of Medicine	19	Office of Postdoctoral Education
Mt. Sinai School of Medicine	25	Office of Postdoctoral Affairs

*Institute a Postdoctoral Steering Committee consisting of both faculty and postdoctoral fellows to assist the Associate Dean/Director.*

The responsibilities of this committee are to:

- Advise the Dean/Director on matters related to postdoctoral education, recruitment and affairs.
- Identify any potential or existing problems and propose intelligent solutions to those problems to improve the environment for postdoctoral training as well as facilitate the retention and recruitment of high quality postdoctoral scholars.
- Serve as review panel for internal competitive postdoctoral awards

*Establish Career Development and Enhancement Awards (estimated cost: 25,000)*

These small grants will be open for competition from the entire postdoc community on a semi-annual basis. These awards are designed to enhance the education and training of the postdocs which also brings benefits to the mentor's research program. As stated above, the Postdoc Steering Committee will review applications. Examples include requests for support to visit a lab for a short period to gain technical knowledge, support to attend a training course, support for travel to present a major talk at a professional meeting, etc.

*Establish Competitive Research Award program (estimated cost: \$5,000)*

These awards will be 'peer-reviewed' by a committee comprising of 3 to 5 postdoctoral fellows. The awards will recognize postdoctoral fellows for positive contributions to the postdoctoral experience, WFUSM research enterprise, and teaching (informal teaching).

*Resources recommended: Faculty Leader*

It is recommended to initially appoint one of the Deputy Associate Deans for Research as the faculty leader for the Office of Postdoctoral Education. Furthermore, as the office evolves, it is recommended to evaluate its organizational location as the search of the Graduate School Dean proceeds forward. There are precedents for this office being under the research or the graduate office. Regardless, there is a need for close cooperation between the graduate school and office of research. The faculty leader will serve as an advocate for postdoctoral education as well as a liaison between departments, human resources, office of research, graduate school and faculty services, as needed.

*Resources recommended: Staff (.50FTE)*

A limited level of staff support is recommended to assist with the postdoctoral association's website, establish and maintain the tracking system, and assist the Faculty Leader

*Resources recommended: Space*

Two offices and/or work places are needed for the faculty leader and the administrative staff. This space can be located within the Graduate School, Office of Research, or Office of Faculty Services.

**Projected Return on Investment**

An enhanced postdoctoral experience at WFUSM will improve the academic reputation as well as the research enterprise of Wake Forest University School of Medicine. In addition to serving as ambassadors for WFUSM, positive postdoctoral programs allow postdocs to

- contribute intellectual capital and new research ideas that enhances current extramural funding and generates new extramural funding in a quicker timeframe than either graduate students or medical students,
- provide training to technicians and graduate students, and
- seek salary supported research fellowships

Moreover, a strong postdoctoral program is important for regional economic development by staffing the growing biotechnology community and environment in Winston-Salem following their experiences at WFUSM. Finally, an increase in the number of young, educated scientific professionals will serve to help reverse the perceived "brain-drain" being experienced by the city.

**Workgroup 6: Appendix 2 – Program Tables**Program: ***Biochemistry***

	WFUSM	Duke
Faculty	28	28
Students	29 (2006-2007)	70 (2005-2006)
#PhD	40 (1996-2006)	73 (1996-2005)
# MS (1996-2006)	8	
Applicants (2005-2006)	70	106
Admitted	11	20
Matriculated	4	5
Average GRE (matriculated)	1087	1334
Average GPA (matriculated)	3.46	3.8
Years to finish		5.3
<i>Placement (% of graduates)</i> faculty	(1996-2006) 36 *	(1992-2001) 5
postdoc/non-tenured faculty	38	47
non-academic science	8.5	38
Faculty with grants and students	12	
Faculty with grants/no students	2	
Faculty with students/no grant	1	
<i>Student funding (2005-2006)</i> % on graduate school stipend	34.5	
% on faculty research grant	51.7	
% on training grant or fellowship	6.9	

\*WFUSM data does not discriminate tenure track from non-tenure track positions.

*Qualifying exam:* by August 1 of year 2*Student evaluation:*

There are 3 points at which students in trouble are identified:  
 1. early on (yrs 1, 2): grades are the major criterion - students have to meet graduate school guidelines (GPA 2.5) and receive B or higher in required BAMB classes. students generally are given option to re-take classes if needed; asked to leave program if this doesn't work

2. prelim: sometimes this becomes a crisis point. last year we changed our guidelines, gave an absolute date of Aug 1 - students can ask for one extension, if they can't meet this deadline they're asked to leave the program. If everything else is satisfactory these students may be given option to complete master's degree

3. after prelim: decision reached by student's advisor, committee & program director that progress in research is unsatisfactory. Discussed with student together with options for remediation. Formally communicated via grades of unsatisfactory in research -- two of these precipitate a decision to terminate a student from the program. These students are almost always given option to complete a master's degree.

Program: **Biomedical Engineering**

	WFUSM	Duke
Faculty	21*	37
Students	23 <sup>†</sup> (2006-2007)	172 (2005-2006)
#PhD	12 (1996-2006)	93 (1996-2005)
# MS (1996-2006)	2	
Applicants (2005-2006)	77	313
Admitted	12	37
Matriculated	31	22
Average GRE (matriculated)	1197	1407
Average GPA (matriculated)	3.34	3.8
Years to finish		5.3
<i>Placement (% of graduates)</i>	(1996-2006)	(1992-2001)
faculty	25	14
postdoc/non-tenured faculty	0	21
non-academic science	67	57
Faculty with grants and students	9	
Faculty with grants/no students	?	
Faculty with students/no grant	1	
<i>Student funding (2005-2006)</i>		
% on graduate school stipend	20	
% on faculty research grant	7.5	
% on 01 start up	30	
% on cross campus	20	
% 02 clinical	7.5	
% VT	0	

\* Five faculty have primary appointments in this Program; 16 faculty are Associates.

<sup>†</sup> approximately 40 more students are located at Virginia Tech and occasionally work in WFUSM laboratories.

*Qualifying exam:* Written and oral exam at the end of Year 2

*Student evaluation:*

Program: **Cancer Biology**

	WFUSM	Duke
Faculty	14 (core)	33
Students	29 (2006-2007)	52 (2005-2006)
#PhD	14 (1996-2006)	34 (1996-2005)
# MS (1996-2006)	1	
Applicants (2005-2006)	55	63
Admitted	8	8
Matriculated	4	4
Average GRE (matriculated)	1265	1463
Average GPA (matriculated)	3.52	3.7
Years to finish	5.0-5.5	5.3
<i>Placement (% of graduates)</i> faculty	(1996-2006) 0 *	(1992-2001) 0
postdoc/non-tenured faculty	43	75
non-academic science	14	25
Faculty with grants and students	5	
Faculty with grants/no students	5	
Faculty with students/no grant	4	
<i>Student funding (2005-2006)</i> % on graduate school stipend	16.7	
% on faculty research grant	20.8	
% on training grant or fellowship	45.8	

\*WFUSM data does not discriminate tenure track from non-tenure track positions.

*Qualifying exam:* by end of year 2

*Student evaluation:*

Review of transcripts and interfaculty communication

Program: ***Clinical Epidemiology/Health Sciences Research***

	WFUSM	Duke (no similar program)
Faculty	52	
Students	24 total	
#PhD (2002-2006)	0	
# MS (1996-2006)	21	
Applicants (2006-2007)	14	
Offered admission (2006-2007)	10	
Matriculated	8	
Average GRE (matriculated)	N/A**	
Average GPA (matriculated)	N/A*	
Years to finish	2-3	
<i>Placement (% of M.S. graduates who also had a Ph.D. or M.D. at matriculation):</i>	(1996-2006)	
faculty	32/39	
postdoc/non-tenured faculty	1/39	
non-academic science	6/39	
Faculty with grants and students		
Faculty with grants/no students		
Faculty with students/no grant		
<i>Student funding (2006-2007)</i>		
% on graduate school stipend***	0	
% on faculty research grant	0	
% on training grant or fellowship	4	

\*WFUSM data does not discriminate tenure track from non-tenure track positions.

\*\* The 2006-2007 was comprised of 80% M.D.s, who are not required to submit GRE scores. Instead they submit MCAT scores and medical school transcripts.

\*\*\* M.S. WFU Biomedical Science programs do not receive stipend support

*Qualifying exam:* N/A, this is a M.S. program with no qualifying exam requirement.

*Student evaluation:* Students are evaluated each semester by the CEHS/HSRP program directors to ensure that they are making good progress toward the completion of the M.S. degree. Approximately 85% of our students finish their M.S. degree within 2.5 years from the time of matriculation.

Program: **Microbiology/Immunology**

	WFUSM	Duke (Immunology)
Faculty	12	32
Students	25 (2006-2007)	42 (2005-2006)
#PhD	33 (1996-2006)	22 (1996-2005)
# MS (1996-2006)	0	
Applicants (2005-2006)	41	61
Admitted	4	12
Matriculated	5	6
Average GRE (matriculated)	1210	1314
Average GPA (matriculated)	3.51	3.3
Years to finish	5.2	5.0
<i>Placement (% of graduates)</i>	(1996-2006)	(1992-2001)
faculty	19	12
postdoc/non-tenured faculty	62	71
non-academic science	19	18
Faculty with grants and students	12	
Faculty with grants/no students	0	
Faculty with students/no grant	0	
<i>Student funding (2005-2006)</i>		
% on graduate school stipend	23.5	
% on faculty research grant	47.1	
% on training grant or fellowship	23.5	

\*WFUSM data does not discriminate tenure track from non-tenure track positions.

*Qualifying exam:* by august 15<sup>th</sup> of Year 2

*Student evaluation:*

All students are evaluated each semester using a standard form. The faculty mentor meets with the student to go over the evaluation and then the form is sent to the Graduate Program Director. New students are evaluated after each lab rotation...same process as with older students.

Program: ***Molecular and Cellular Pathobiology***

	WFUSM	Duke (Cell and Mol Bio)
Faculty		127
Students	17 (2006-2007)	28 (2005-2006)
#PhD	23 (1996-2006)	72 (1996-2005)
# MS (1996-2006)	7	
Applicants (2006-2007)	15	258
Admitted	9	54
Matriculated	6	23
Average GRE (matriculated)	1230	1367
Average GPA (matriculated)	3.14	3.6
Years to finish		5.0
<i>Placement (% of graduates)</i>	(1996-2006)	(1992-2001)
faculty	21	4
postdoc/non-tenured faculty	17	41
non-academic science	28 <sup>¶</sup>	18
Faculty with grants and students	38	
Faculty with grants/no students	33	
Faculty with students/no grant	8	
<i>Student funding (2005-2006)</i>		
% on graduate school stipend	32	
% on faculty research grant	42	
% on training grant or fellowship	26	

\*WFUSM data does not discriminate tenure track from non-tenure track positions.

<sup>¶</sup> and 34% are "other" (stay at home mom, missionary, graduate student at other institution, technician)

***Qualifying exam:***

summer after the student's second year of graduate study. The written exam will occupy a one-to two-day period and the questions are designed to evaluate the student's ability to integrate knowledge from course work, seminars, and journal clubs. It is an open book exam.

Program: ***Molecular Genetics and Genomics***

	WFUSM	Duke (Genetics and Genomics)
Faculty	61	70
Students	26 (2006-2007)	50 (2005-2006)
#PhD	17 (1996-2006)	23 (1996-2005)
# MS (1996-2006)	1	
Applicants (2005-2006)	26	101
Admitted	2	23
Matriculated	5	9
Average GRE (matriculated)	1182	1316
Average GPA (matriculated)	2.95	3.4
Years to finish	5.4	
<i>Placement (% of graduates)</i> faculty	(1996-2006) 29.4	(1992-2001) information not posted
postdoc/non-tenured faculty	47.1	
non-academic science	5.9	
Faculty with grants and students	14	
Faculty with grants/no students	26	
Faculty with students/no grant	0	
<i>Student funding (2005-2006)</i> % on graduate school stipend	36.8	
% on faculty research grant	52.6	
% on training grant or fellowship	5.3	

\*WFUSM data does not discriminate tenure track from non-tenure track positions.

*Qualifying exam:* complete before Year 3

*Student evaluation:* We have annual reviews of each student's progress. Failure to maintain an appropriate GPA or lack of progress in research are basis for recommending the student leave the program.

Program: ***Molecular Medicine***

	WFUSM	Duke (no similar program; Baylor has a similar program in its 1 <sup>st</sup> year—data are for Baylor)
Faculty	49	118
Students	33 (2006-2007)	10
#PhD (2002-2006)	11	Not Applicable (N/A)
# MS (1996-2006)	0	N/A
Applicants (2005-2006)	22	Unknown
Admitted	4	9
Matriculated	10	Unknown
Average GRE (matriculated)	1190	Unknown
Average GPA (matriculated)	3.50	Unknown
Years to finish	5.1	
<i>Placement (% of graduates)</i> faculty	(1998-2006) 20	N/A
postdoc/non-tenured faculty	50	
non-academic science	20	
Faculty with grants and students	19	Unknown
Faculty with grants/no students	21	
Faculty with students/no grant	0	
<i>Student funding (2005-2006)</i> % on graduate school stipend	18	Unknown
% on faculty research grant	55	
% on training grant or fellowship	27	

\*WFUSM data does not discriminate tenure track from non-tenure track positions.

*Qualifying exam:* Oral exam in fall of 3<sup>rd</sup> year

*Student evaluation:* Mol Med Executive committee reviews the progress of each student on a semi-annual basis. For marginal or failing students, the Program Directors have frequent meetings to provide strategies for success. Once a student is in a thesis laboratory, the mentor of the student and his/her thesis committee reviews progress and provides written evaluation to the Executive Committee.

Program: ***Neurobiology and Anatomy***

	WFUSM	Duke (Neurobiology)
Faculty	20	70
Students	17 (2006-2007)	39 (2005-2006)
#PhD	18 (1996-2006)	41 (1006-2005)
# MS (1996-2006)	3	
Applicants (2005-2006)	20	120
Admitted	2	16
Matriculated	2	5
Average GRE (matriculated)	1280	1420
Average GPA (matriculated)	3.74	3.6
Years to finish	5.5	6.0
<i>Placement (% of graduates)</i> faculty	(1996-2006) 23.8	(1992-2001) 12
postdoc/non-tenured faculty	38.1	34
non-academic science	14.3	38
Faculty with grants and students	9	
Faculty with grants/no students	2	
Faculty with students/no grant	0	
<i>Student funding (2005-2006)</i> % on graduate school stipend	43.8	
% on faculty research grant	43.8	
% on training grant or fellowship	6.3	

\*WFUSM data does not discriminate tenure track from non-tenure track positions.

*Qualifying exam:* end of Year 2

*Student evaluation:*

The program director meets with students at least once at the end of every semester to go over their transcripts. If there is a problem or potential problem (e.g. grades below expectation), the program director discusses the situation and possible alternatives (e.g. repeating a course or a block in a course). He also discusses the situation with the student's adviser. If the problem persists or is more serious, a committee is called to study the best course of action. However, the last time this happened was 4 years ago, so this is rather infrequent.

Program: **Neuroscience**

	WFUSM	Duke
Faculty	106	70
Students	27 (2006-2007)	39 (2005-2006)
#PhD	31 (1996-2006)	41 (1006-2005)
# MS (1996-2006)	3	
Applicants (2005-2006)	55	120
Admitted	5	16
Matriculated	7	5
Average GRE (matriculated)	1258	1420
Average GPA (matriculated)	3.29	3.6
Years to finish	5.0	6.0
<i>Placement (% of graduates)</i> faculty	(1996-2006) 26.7	(1992-2001) 12
postdoc/non-tenured faculty	43.3	34
non-academic science	26.7	38
Faculty with grants and students	14	
Faculty with grants/no students	67	
Faculty with students/no grant	0	
<i>Student funding (2005-2006)</i> % on graduate school stipend	25	
% on faculty research grant	25	
% on training grant or fellowship	42	

\*WFUSM data does not discriminate tenure track from non-tenure track positions.

*Qualifying exam:* between Year 2 and 3 (by Sept 30 of Year 3)

*Student evaluation:* Student evaluation committee reviews student progress on yearly basis. This is a review of transcripts and progress reports submitted by student and advisor.

Program: **Physiology/Pharmacology**

	WFUSM	Duke (Pharmacology)
Faculty	24 (tenure track)	41
Students	28 (2006-2007)	56 (2005-2006)
#PhD	46 (1996-2006)	62 (1996-2005)
# MS (1996-2006)	4	
Applicants (2005-2006)	47	56
Admitted	10	12
Matriculated	4	5
Average GRE (matriculated)	1265	1340
Average GPA (matriculated)	3.21	3.5
Years to finish	4.4	5.7
<i>Placement (% of graduates)</i> faculty	(1996-2006) 8.7	(1992-2001) 7
postdoc/non-tenured faculty	34.8	52
non-academic science	34.8	40
Faculty with grants and students	13	
Faculty with grants/no students	7	
Faculty with students/no grant	0	
<i>Student funding (2005-2006)</i> % on graduate school stipend	25.9	
% on faculty research grant	37.0	
% on training grant or fellowship	33.3	

\*WFUSM data does not discriminate tenure track from non-tenure track positions.

*Qualifying exam:* 3-day written qualifying exam at the end of the spring semester of the second year (if in good academic standing). Once written is passed, they put together a thesis proposal committee, write a proposal and defend it sometime during Year 3.

*Student evaluation:*

We have yearly evaluation forms that advisor and student fill out and sign which gives us a heads up (OK we just started those this year). Plus we have an evaluation committee that acts as surrogate advisor for first years and steps in to monitor situations that arise when students are in trouble. The evaluation committee can be called upon by the advisor or the student, but usually is called upon by low grade reports or failing parts of the preliminary exam (written or oral).