Umbrella Graduate Programs

A report from the Vanderbilt IGP
after 13 years

Interdisciplinary Graduate Program
Biomedical Sciences

Originated 1992

10 Departments/Programs

- Biochemistry
- Cell Biology
- Cancer Biology
- Pathology
- Pharmacology
- Molecular Biology (Biological Sciences)
- Neuroscience
- Molecular Physiology and Biophysics
- Microbiology and Immunology
- Human Genetics

IGP Curriculum

Fall

Proteins/Nucleic Acids
Quantitative Reasoning
Biostatistics
Genetics and Development
Cell Biology
Gene Expression

RCR
Methods

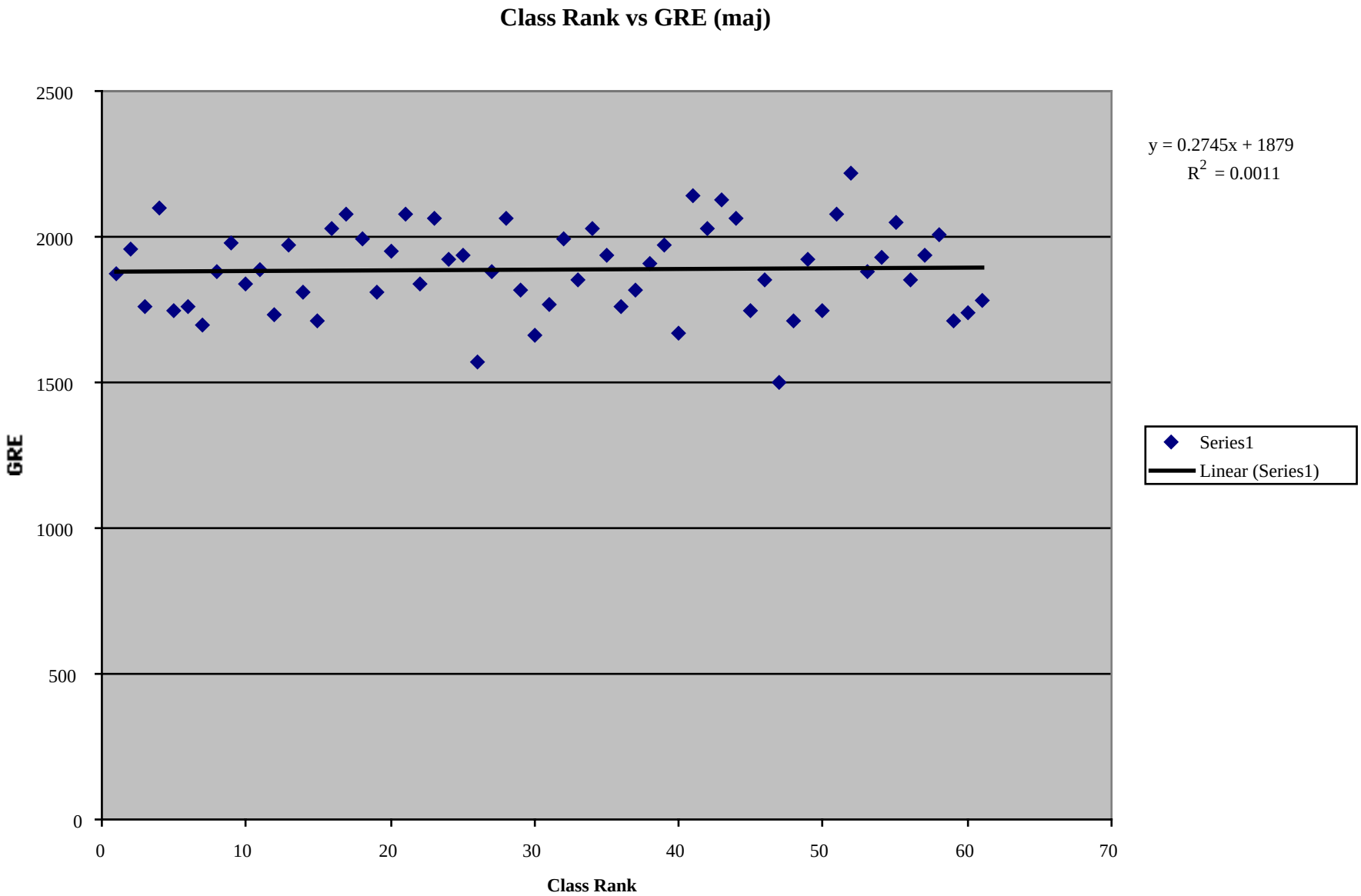
Spring

Neuroscience
Cell Signaling and Endocrinology
Defense Mechanisms
Microbial Pathogenesis
Cell Division and Cancer Biology
Cellular Pathology

Elective

Comparison of Pre- and Post IGP Data

	Pre-IGP	Data for IGP
% Offers accepted	30-40%	55-70%
Number admitted each year	30 (max)	84 in 2005
Average GRE (V+Q+A)	1750	1940
Attrition	~ 25%	< 15%
Time to prelims	~ 22 mo.	~ 22 mo.
Time to graduate	ca. 5.6 yr.	ca. 5.2 yr.
Minority students	2 in five years	up to 15 /yr
Final location of students	Tended to senior faculty	Tend to junior faculty


Class Rank vs GRE (maj)
2500
2000
1500
1000
500
0
GRE
0
10
20
30
40
50
60
70
Class Rank
y = 0.2745x + 1879
R2 = 0.0011
Series1
Linear (Series1)

Why do students come to Vanderbilt IGP?

Strong reasons:

- IGP courses and approach
- Research opportunities
- Collegial atmosphere
- Facilities

Unimportant factors:

- Stipend
- Reputation
- Nashville

Why Students don't come to Vanderbilt

Strong Reasons:

- Research Opportunities
- Program Offered
- Funding for Research

Minor Factors:

- Stipend
- Core facilities
- National Rankings

Factors impacting Minority Students and Science

	URM/ MORE	URM/ No MORE	Non-URM
Undergraduate Institution			
Minority Serving	66	42	0
Private	9	21	34
Public	22	35	66
Why Enter Research			
Pay	7	7	0
Respect	10	21	5
To Cure Disease	66	86	48
Like Problem Solving	73	71	76
Positive Influence?			
HS Teacher	7	14	19
Undergrad Faculty	56	50	48
Summer Program Mentor	20	14	19
Family	27	21	19
Friends	2	21	5
Negative Influence?			
Undergrad Faculty	10	14	10
Summer Research Faculty	17	29	14
Other People in Research	15	29	19
Family	12	0	0
Community	12	0	0
Value of Summer Research			
Rated as high to very high	93	71	86
Was NIH Funding Valuable	80	71	71
Could not have done with out			
Attended ABRCMS Meeting?	80	21	5
Family Income <$30 K	24	21	24

Productivity Comparisons

	Postdocs, time in residence (years)				students
	3-3.5	4.5-4.5	4.5-6.0	>6.0	
Average number of total publications	5.2	5.4	6.0	6.3	3.9
Average number if one deletes outliers* (more than 3x average)	4.4	4.7	4.7	5.7	3.9
Publications per year of research	1.35	1.17	0.9	0.8	1.18**

Student IGP Survey: 2004/2005

1. *The IGP support staff were supportive and helped make the overall experience a success.*
Positive: ***100%***
Neutral: ***0%***
Negative: ***0%***

2. *The IGP core course provided a strong and broad base for the development of studies in biomedical research.*
Positive: ***85%***
Neutral: ***11%***
Negative: ***4%***

3. *The research opportunities in the departments are of a high caliber.*
Positive: ***89%***
Neutral: ***11%***
Negative: ***0%***

4. *The process for arranging research rotations worked well for me.*
Positive: ***74%***
Neutral: ***11%***
Negative: ***15%***

5. *I was able to find a lab which is a good fit for my future research training.*
Positive: ***93%***
Neutral: ***7%***
Negative: ***0%***

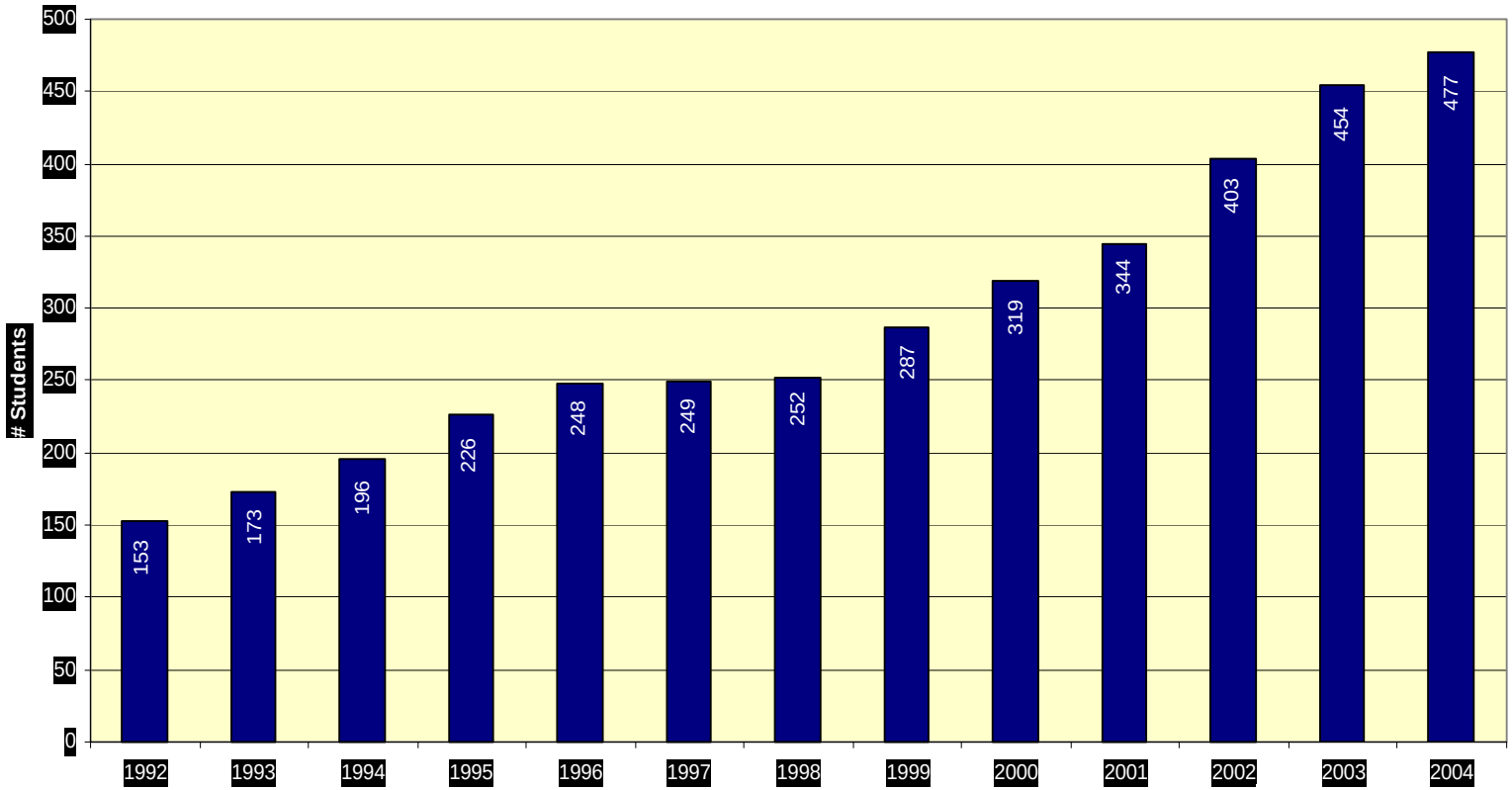
6. *My ability to read and digest the research literature has been substantially developed over the year.*
Positive: ***71%***
Neutral: ***22%***
Negative: ***7%***

7. *I was able to play an appropriate role in the recruiting activities of the next year's class.*
Positive: ***78%***
Neutral: ***22%***
Negative: ***0%***

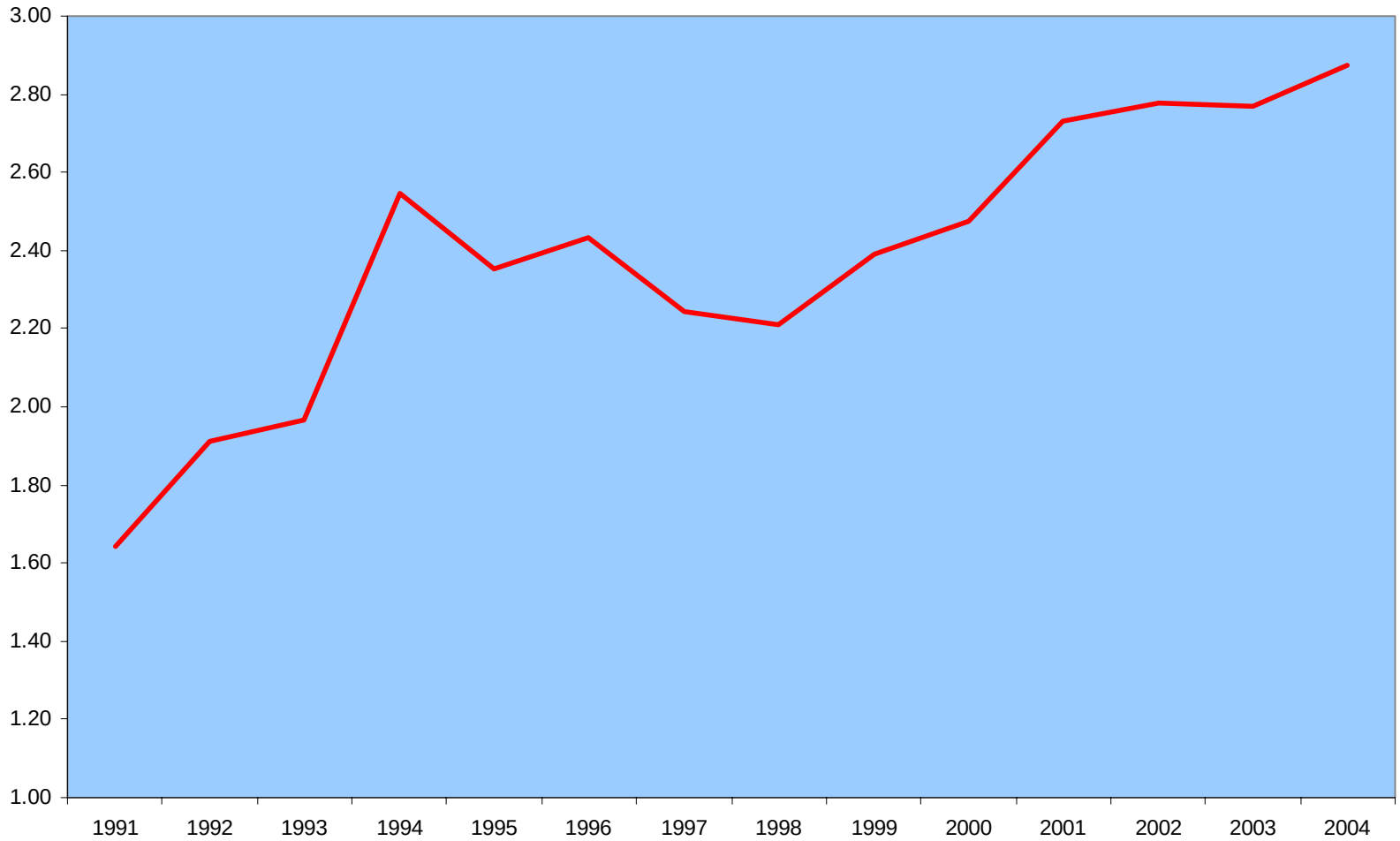
8. *The Director of the IGP was sensitive to the interests of the students and worked on their behalf.*
Positive: ***90%***
Neutral: ***7%***
Negative: ***3%***

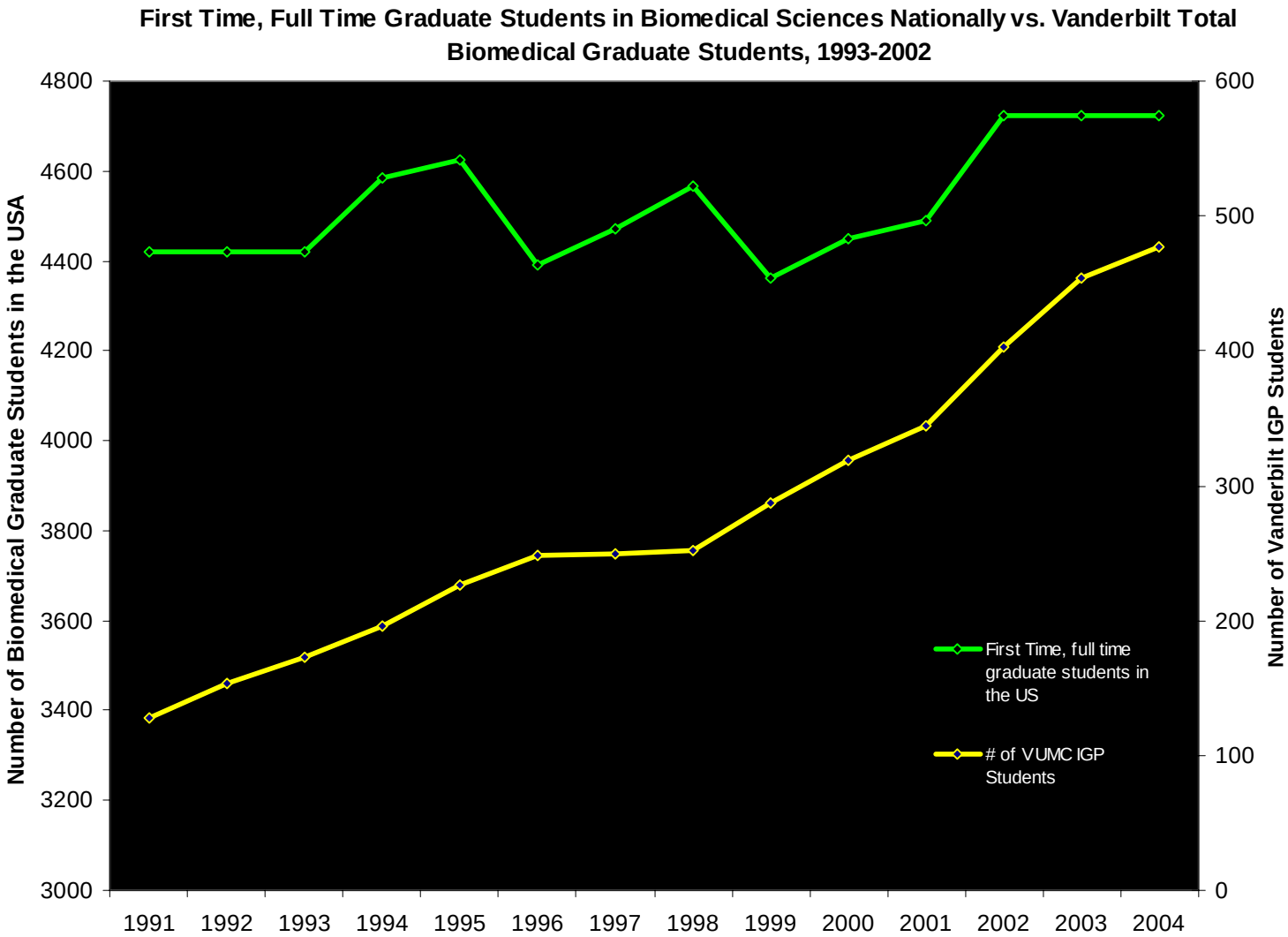
9. *I think providing more information about quantitation, genomics and statistics would be a good approach.*
Positive: ***96%***
Neutral: ***4%***
Negative: ***0%***

Number of Graduate students in IGP-supported Programs (Fall 2004)

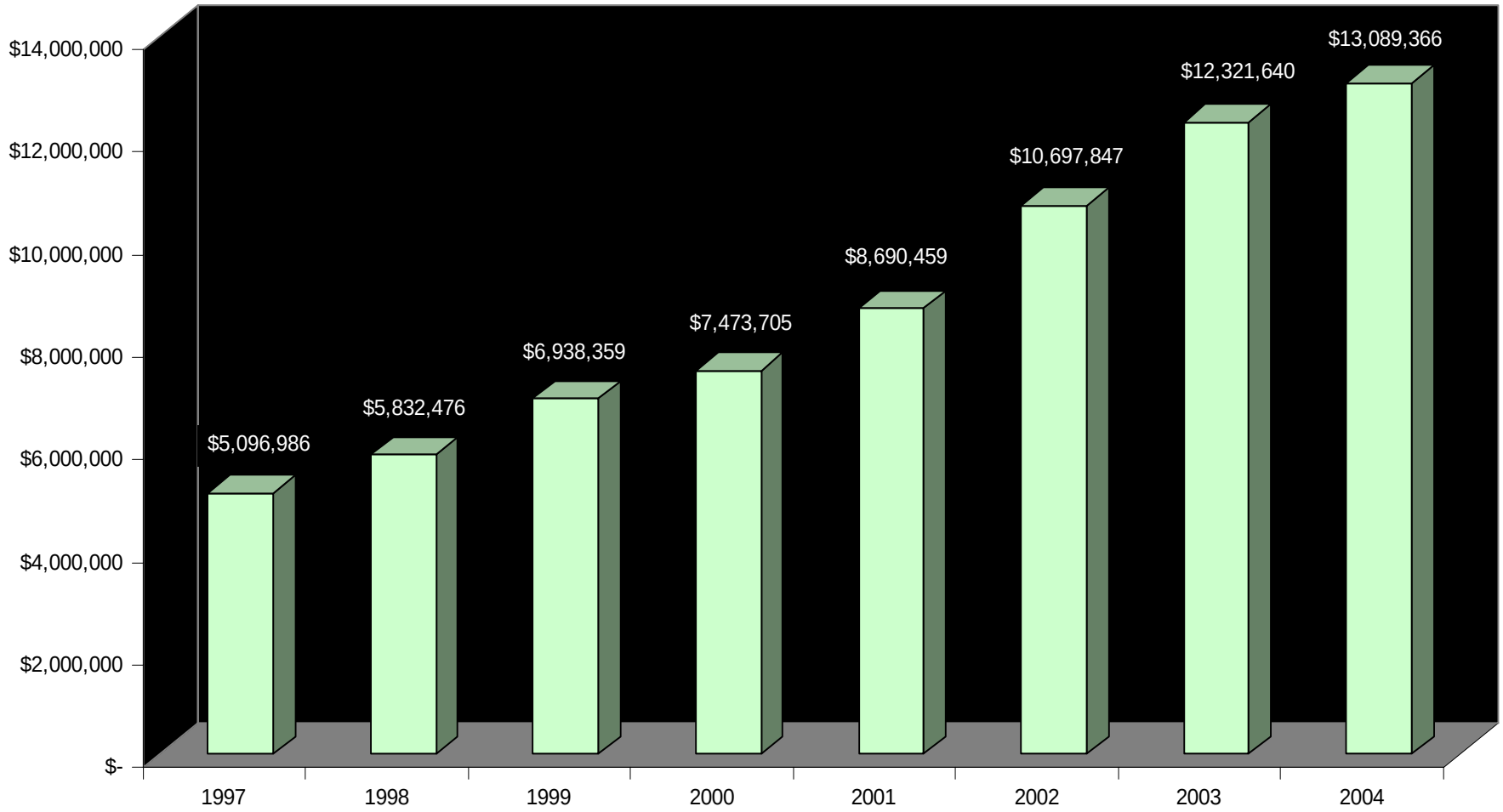


Ratio IGP Student:Faculty, 1991-2004

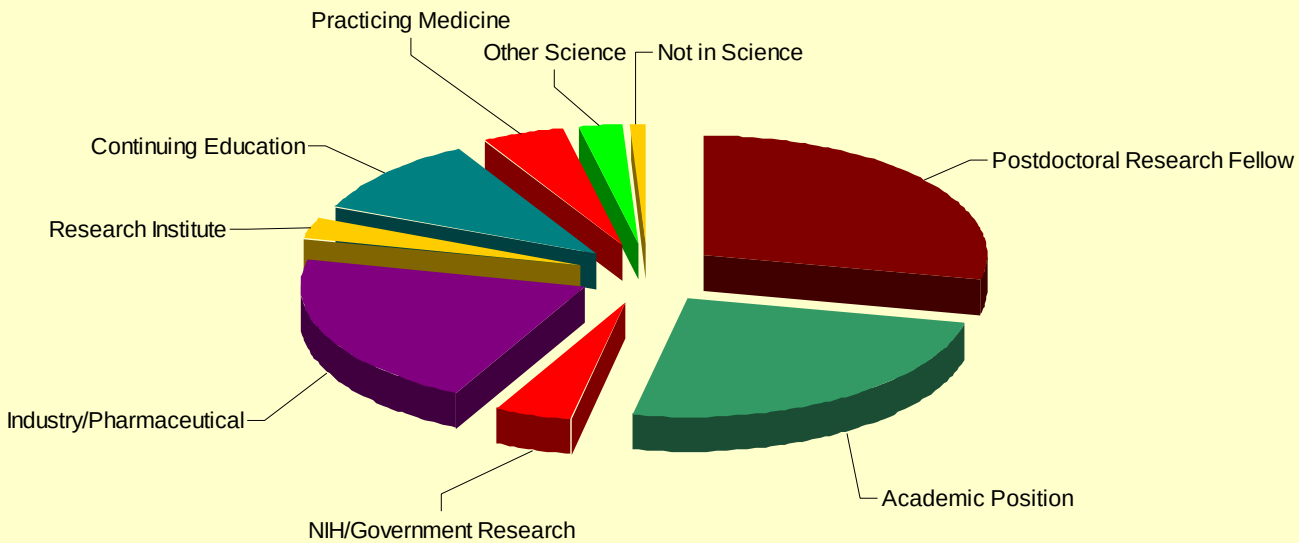



First Time, Full Time Graduate Students in Biomedical Sciences Nationally vs. Vanderbilt Total Biomedical Graduate Students, 1993-2002
Number of Biomedical Graduate Students in the USA
Number of Vanderbilt IGP Students
4800
4600
4400
4200
4000
3800
3600
3400
3200
3000
600
500
400
300
200
100
0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
First Time, full time graduate students in the US
# of VUMC IGP Students

Vanderbilt University Training Grant History (T-series), Direct Costs 1997-2004



Vanderbillt School of Medicine
Graduate Student Outcomes, 1993-2003



Neuroscience Survey

Students in the Vanderbilt Biomedical and Bioscience Programs were surveyed. 60 (30%) responded.

23% (14) interested in Neuro when they decided to come to Vanderbilt
77% (46) not interested

13% (6) of the 77% of incoming IGP Students that were not interested in Neuro, nevertheless ended up on a Neuro project
87% (40) did not

86% (12) of the 23% that were specifically interested in Neuro ended up on a Neuro project
14% (2) did not

So net gain to Neuroscience program is 4/14 = 29%

Neuroscience Survey

For those students who ended up in Neuro research and who had intended it all along

58% said the IGP helped to find the right lab
42% said the IGP did not help

They indicated that the IGP courses overall offered an asset to career development
17% Very
58% Quite a lot
25% Somewhat

IGP Neuro course component relevant to their current neuroscience interests?
33% Very
50% Quite a lot
17% Somewhat

Neuroscience Survey

<u>For those students who ended up in a Neuro lab, but did not have that as a primary goal when they entered the IGP</u>

83% said the IGP helped to find the right lab
17% said the IGP did not help

They indicated that the IGP courses overall offered an asset to career development
17% Very
50% Quite a lot
17% Somewhat
17% Not much

The IGP Neuro component is relevant to their current Neuro interests?
17% Very
33% Quite a lot
50% Somewhat

Neuroscience Survey

<u>For the students who did not end up doing Neuro research</u>

Was the exposure to Neuro as part of the IGP of value?
21% Very much
33% Quite a lot
43% Somewhat
12% Not much

14% did a rotation in a Neuro lab
86% did not rotate in a Neuro lab

2% came close to to choosing a Neuro lab
98% did not come close

Functions of IGP Office

- Recruiting
- All academic aspects of the first year training
- Fiscal matters including paying stipends and administering tuition remission
- Summer training program
- Quality control
- Dean's tuition award program

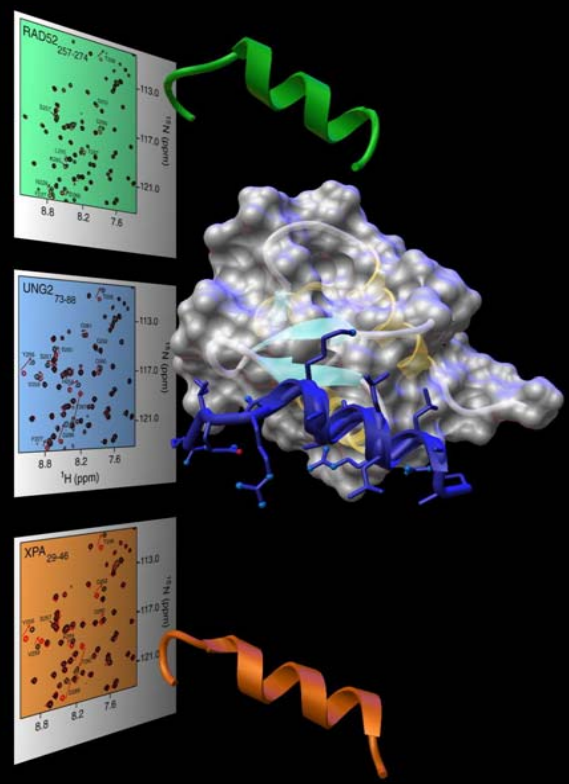
- Interactions with training grants

  Publish the only up-to-date listing of advanced electives available
- Faculty database
- Assist with fellowship applications
- Handle Responsible Conduct in Science Program

CPB
Chemical and Physical Biology Program

The CPB Program is a PhD track, multidisciplinary program introducing elements of biology to students trained in the quantitative sciences and who wish to pursue a doctoral degree at the interface of the chemical, physical, and biological sciences.

Program started in 2000 with joint funding from A&S and the School of Medicine



CPB
General Information

- Designed to address the need for creative graduate training in Molecular Biophysics and to introduce much-needed chemists, physicists, mathematicians, engineers and computer scientists to biological problems.
- Applicant pool doubling every year – 89 completed applications for Fall 2005 class
- Funding for 10 students/year at steady state
- 12 Students accepted offers this year
- Average GRE Analytical 5.2, Quantitative/Verbal 1290

A Personal Assessment

- The plusses:
  - **Increased number of students**
  - **Higher quality students, low attrition**
  - **Well-trained students, ready for research**
  - **Faculty well informed and supportive**

more

more plusses

- **Elective teachers know what has been covered**
- **Cost effective**
- **Happy students, great class *esprit de corps***
- **Junior faculty gain ample access to students**
- **Increase in faculty collegiality as they share teaching and joint recruiting efforts**

more

more
plusses...

- **Great for recruiting new faculty!**
- **Maintained faculty database: a major resource for center grants, SCORs, training grants**
- **Students highly interactive across departments after the first year**
- **Students have access to MD laboratories**
- **System rewards aggressive and entrepreneurial departments**

A personal Assesssment

- The negatives:
  - **Funding for first year not defined by the number of students who can be supported in subsequent years**
  - **Departmental exposures - burnout**
  - **Annual imbalance in distribution**

Words that I live by….

No good deed goes unpunished.

The squeaky wheel always gets the grease.

The road to hell is paved with good intentions.

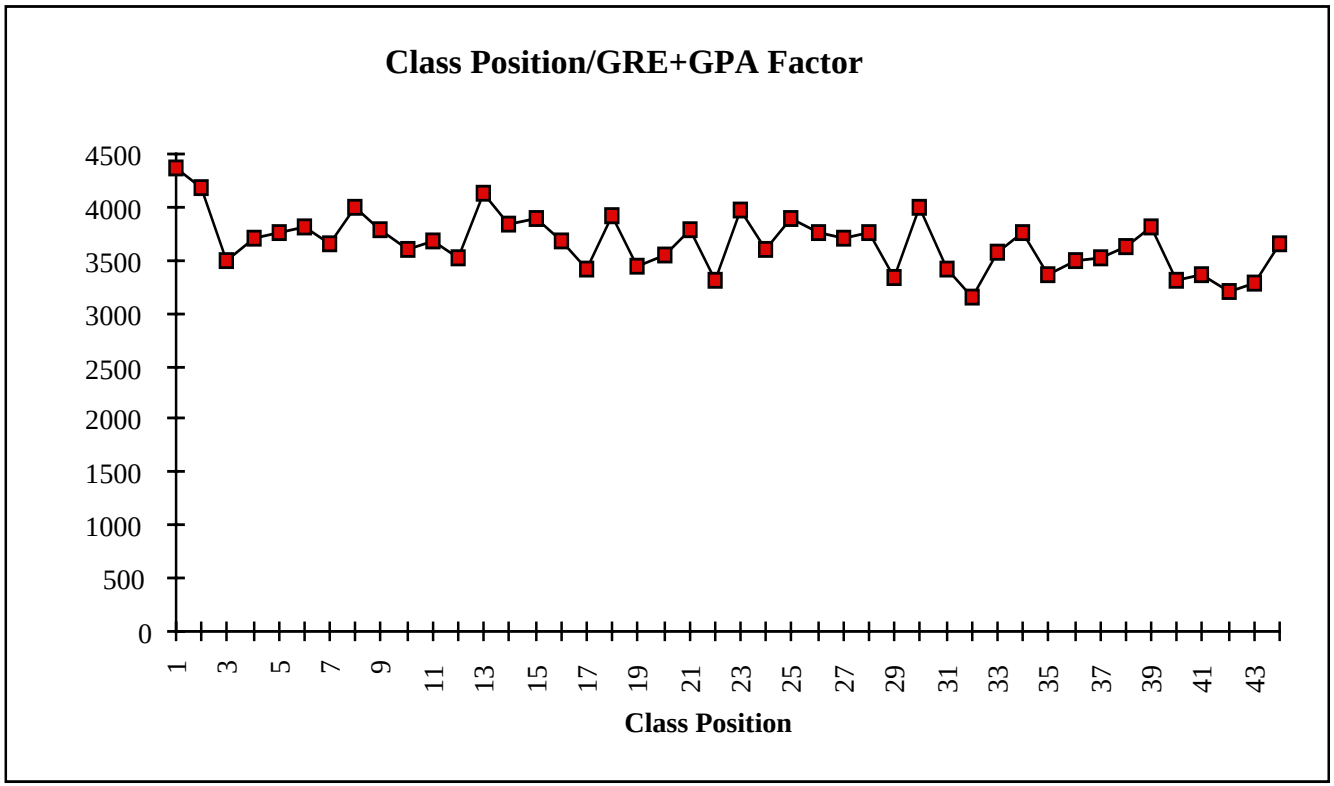
All the monkeys aren't in the zoo…

every day you meet one or two.

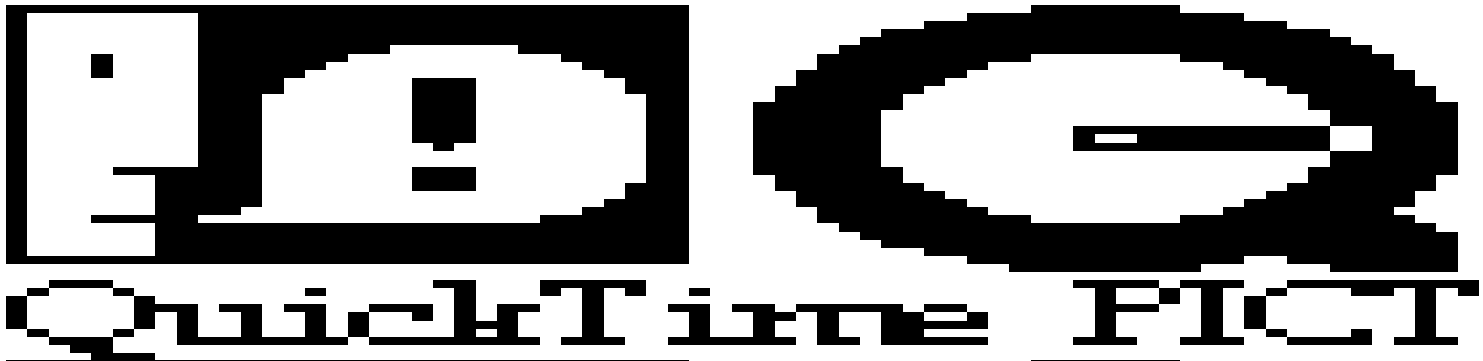
Questions or Comments?

I will also be available for focus group discussions later today and I will be delighted to talk (715 343 7251) or correspond by email Roger.Chalkley@Vanderbilt.edu

Position in Class vs RC Factor*



* (Sum of GRE plus 500 x GPA)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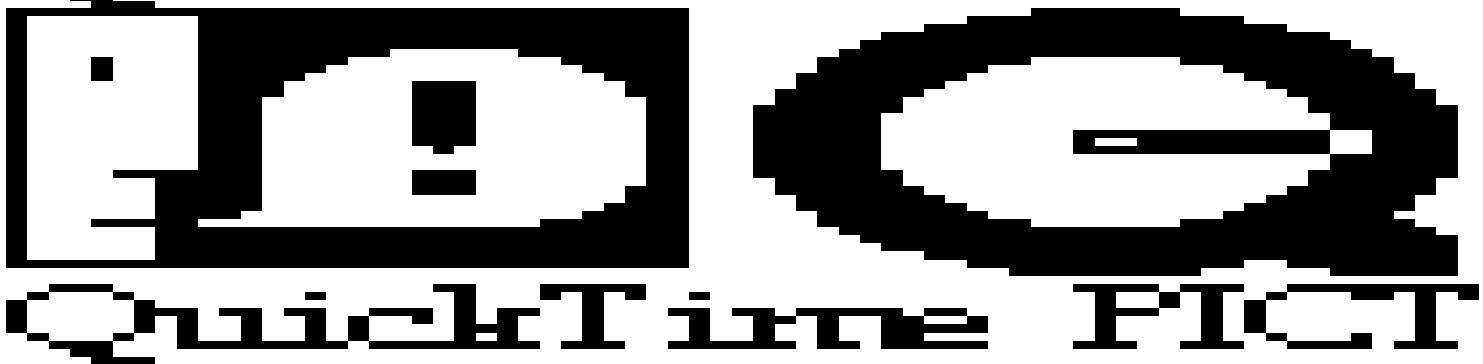
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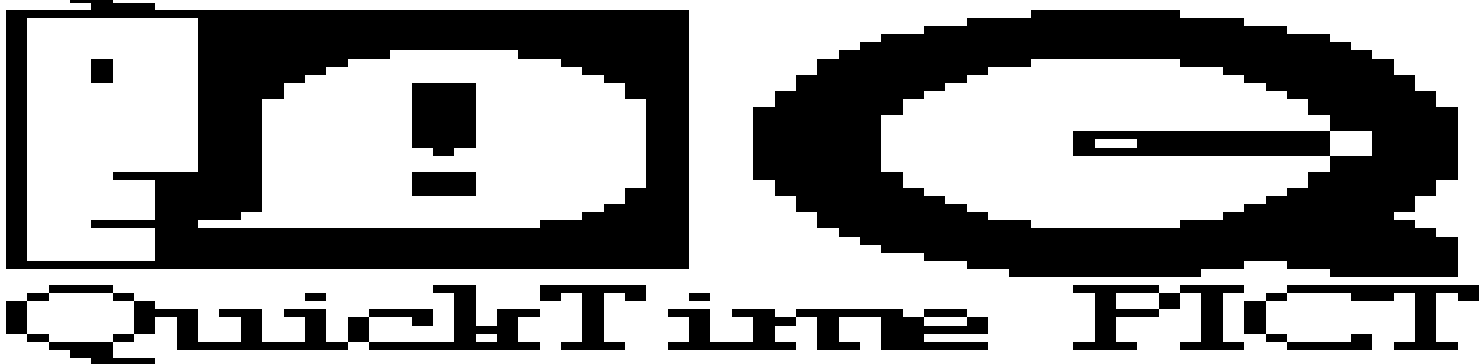
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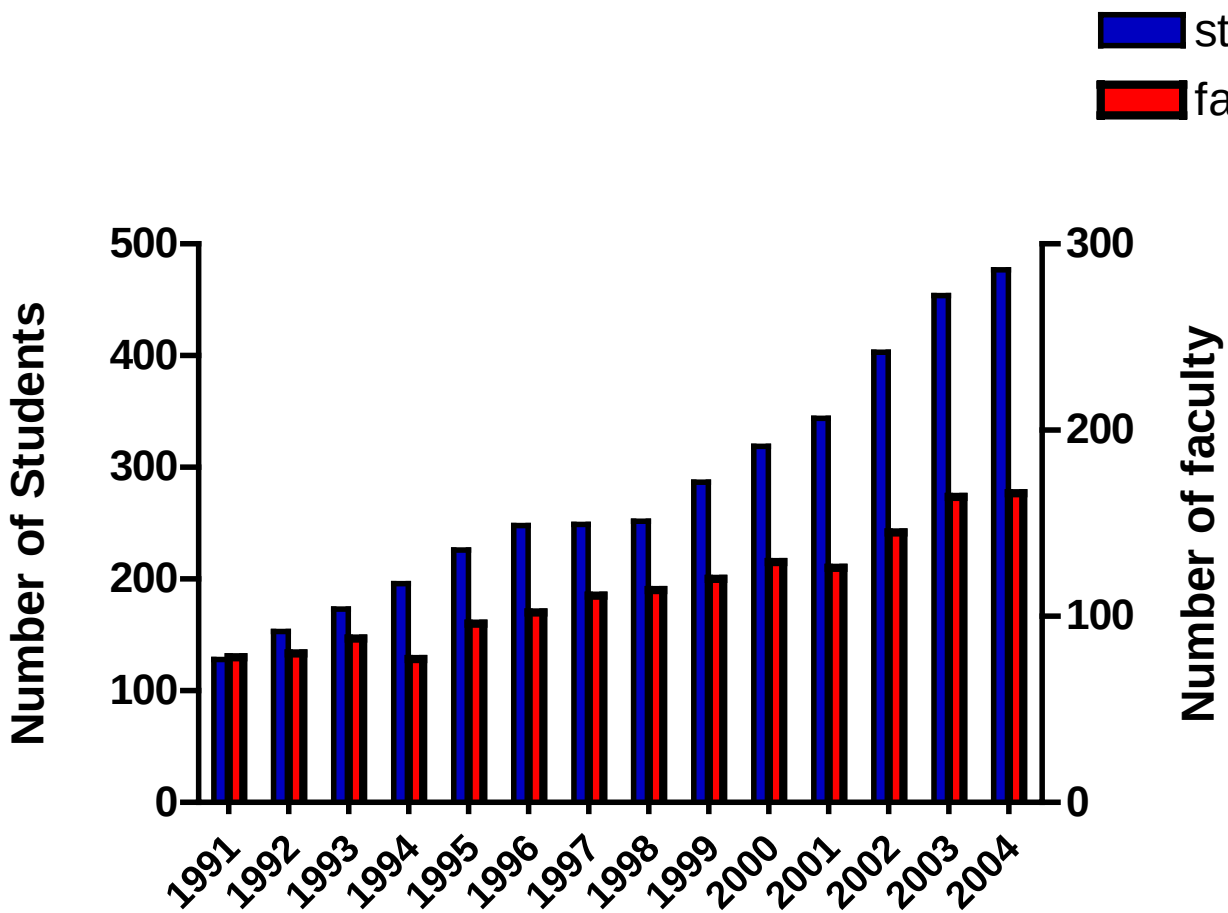
Interdisciplinary Graduate Program Students
vs. Number of Tenure-track Basic Science Faculty at VUMC, 1991-2004



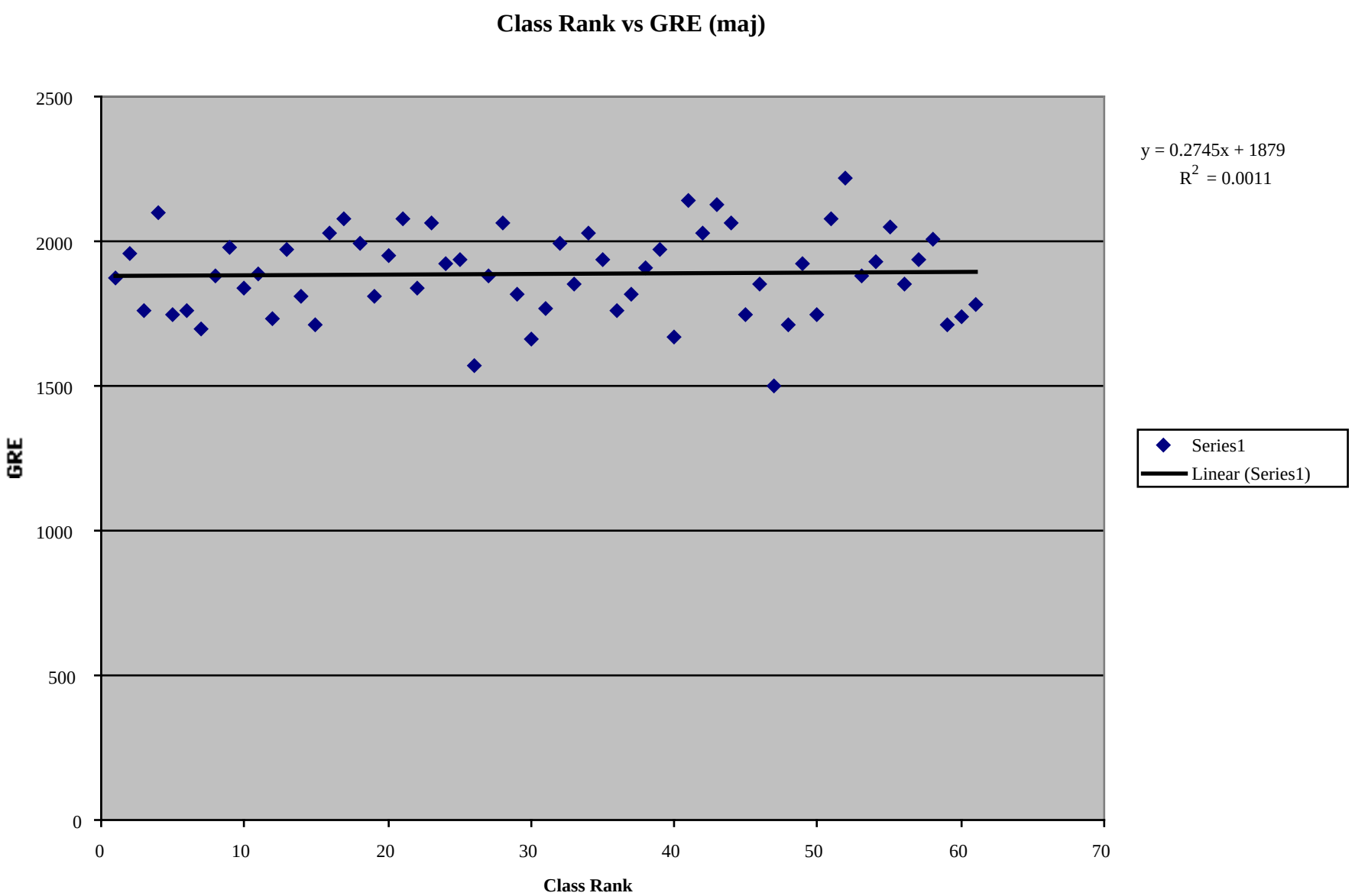
CPB
Curriculum

- Highly individualized taking into account students undergraduate training and their projected career path
- Molecular Biophysics Seminar
- Chemical Biology Seminar
- Electives - transinstitutional
- Three 8-10 week rotations in first two semesters
- 13 participating departments and programs
- Students select mentor at end of second semester
- PhD Degree in Chemical & Physical Biology (pending)

IGP

Faculty: 200

Current Student Number: 480
Total Students Prior to IGP: 129
Current Class: 88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500
0
GRE
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40
50
60
70
Class Rank
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R2 = 0.0011
Series1
Linear (Series1)

more
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IGP and Time to Degree

IGP First Five Years	Prior to IGP
5.2 +/- 0.2 yrs	**5.7 +/- 0.3 yrs**

(Approximately 200 students in each sample)