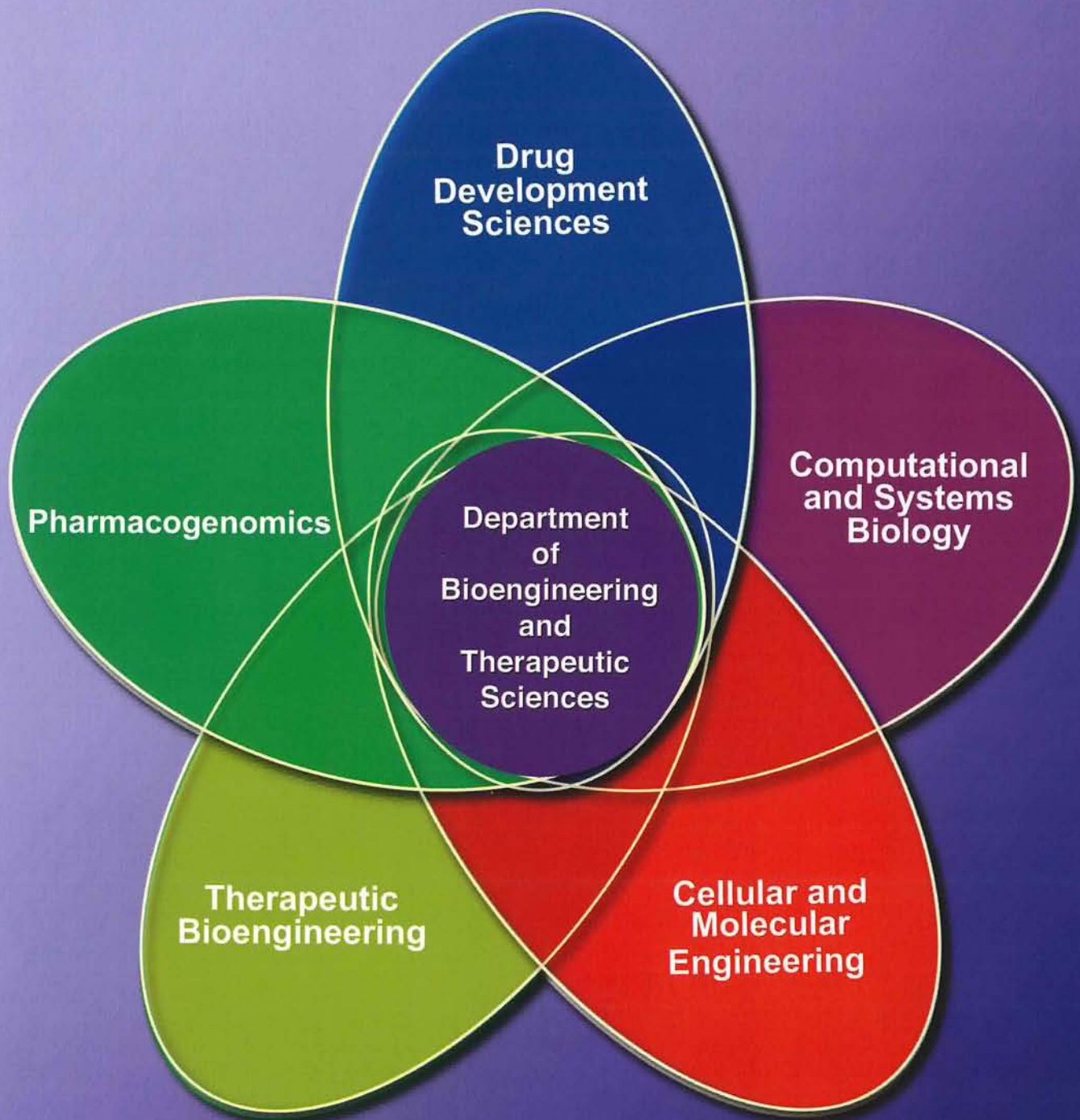


# PROPOSED DEPARTMENT OF BIOENGINEERING AND THERAPEUTIC SCIENCES



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April 4, 2008

J. Michael Bishop, M.D.  
Chancellor, University of California San Francisco  
513 Parnassus Ave, Medical Sciences Building 126 MC 0402  
University of California, San Francisco  
San Francisco, CA 64143 – 0402

Dear Michael,

We are pleased to submit a proposal to create a new Department of Bioengineering and Therapeutic Sciences, which will be a joint department in the School of Medicine and the School of Pharmacy – the first such joint department at UCSF. The new department will combine the unique strengths of School of Pharmacy's Department of Biopharmaceutical Sciences (BPS) with those of the Bioengineering Program in the School of Medicine, and will demonstrate, in a new and unique way, UCSF's commitment to interdisciplinary partnerships.

The proposal includes a statement of the motivation to create this department, which we feel is well-aligned with UCSF's strategic plan. It then provides succinct descriptions of the proposed department's research areas, educational activities and opportunities for graduate and professional students. The proposal addresses the formation, leadership, space and personnel, as well as the financial resources and responsibilities. The appendices include faculty rosters, administrative structure, personnel count, space allocation, and a ten-year budget.

This proposal has been enthusiastically endorsed by the faculty councils in both schools. We understand that an ad-hoc committee will be appointed to review the proposal followed by an email vote by the Academic Senate. The Deans of the Schools of Dentistry and Nursing are also very supportive of this proposal.

We are enthusiastic about the formation of the joint department, and believe that the Department of Bioengineering and Therapeutic Sciences will make important contributions to the research, educational and public health missions of UCSF, both within and beyond our Campus.

Sincerely,

Sam Hawgood, MB, BS.  
Interim Dean, School of Medicine

Mary Anne Koda-Kimble, PharmD.  
Dean, School of Pharmacy

Cc: A. Eugene Washington, M.D. Executive Vice Chancellor and Provost  
Sally Marshall, Ph.D. Vice Provost, Academic Affairs

# PROPOSAL FOR FORMATION OF THE UCSF DEPARTMENT OF BIOENGINEERING AND THERAPEUTIC SCIENCES

## Introduction

The objective of this proposal is to present the plans for establishing the Department of Bioengineering and Therapeutic Sciences (BTS) as the first joint department between the Schools of Pharmacy and Medicine at UCSF. This innovative concept will integrate the activities of the current Department of Biopharmaceutical Sciences with the interdisciplinary Program in Bioengineering. It will provide a rich infrastructure for basic and translational research and will also facilitate the implementation of novel educational paradigms for students in professional and graduate degree programs. The motivation for creating the new department came from the initiative of its faculty, who recognized that there was significant overlap in their long term goals and wanted to take advantage of the synergy between the computational and engineering technologies they were developing and their applications to drug development, pharmacogenomics and biomedical sciences. Furthermore, the external reviewers of the Bioengineering graduate program stressed in their recommendations the need to improve the infrastructure and recruit new faculty in this field. The formation of the Department of Bioengineering and Therapeutic Sciences is consistent with the overall strategic plan for UCSF and the long-term objectives of the two schools. It provides a natural focus for collaborative research and will encourage the development of partnerships with industry and other academic institutions.

## Motivation - Department of Biopharmaceutical Sciences

The faculty within the School of Pharmacy and, in particular, within the Department of Biopharmaceutical Sciences (see Appendix A), has strong programs with an international reputation in drug development sciences. One of the most exciting new areas of research in this field is pharmacogenomics, which focuses on how genetic variation affects drug response variability. This includes the identification of genetic variants in drug metabolizing enzymes, transporters and targets, functional characterization of these variants, and the clinical association of functional polymorphisms with drug response. Drug response is a complex phenotype and emerging bioengineering tools in human genetics are being utilized to dissect the variation in multiple genes that contribute to its effect. To meet these challenges, the faculty has taken a strategic decision to enhance their research and educational program in fields such as bioinformatics, computational and systems biology. Areas of interest include:

- quantitative methodologies for drug design and evaluation
- genomics and high throughput screening of biological samples
- novel approaches for drug targeting and delivery
- computational modeling and design of complex systems
- technologies for phenotyping drug response
- cellular and molecular engineering

UCSF researchers have made significant discoveries in the study of individual biological systems, systems biology and synthetic biology. These are emerging interdisciplinary approaches that aim to study the mechanisms underlying complex biological processes as integrated systems of many diverse but interacting components. Areas of interest include modeling biomolecular networks, designing and engineering new pathways and studying the evolution of protein interactions and pathways. Future research includes computational analysis of complex biological systems, modeling diseases and systems level study of metabolic networks. These are highly synergistic with Bioengineering faculty at UCSF.

## Motivation - Program in Bioengineering

There has been a major expansion in Bioengineering over the last ten years, with many new Departments having been formed, including those at UCSD, UCD, UCB and Stanford. This has been

fueled by a huge demand from undergraduate and graduate students, which has also led to the joint UCSF/UCB Bioengineering graduate group growing from its previous steady state of 50 to 171 students in the current year. The increasing desire for focused efforts in this field culminated at the national level with the formation of a new NIH Institute for Biomedical Imaging and Bioengineering that now supports a large portfolio of research grants. At UCSF the development of a more formal infrastructure for bioengineering led initially to the formation of a division and then to the expansion of its activities to form an inter-disciplinary program within the School of Medicine. While the faculty in this program (see Appendix A) has been successful in planning the research agenda and recruiting two of the three faculty positions that had been assigned to bioengineering, it has not been able to keep up with the demands of the growing student body. The recent external review of the Joint Graduate Group in Bioengineering concluded that continued development of the discipline at UCSF was being hampered by:

- the limited visibility of Bioengineering, both within UCSF and on the national scene
- dependence on a relatively small number of faculty who have competing demands on their time
- imbalance between the resources assigned to the academic program at UCSF and the Department at UCB

Key recommendations made by the external reviewers were that there should be a UCSF Department of Bioengineering with a larger pool of dedicated faculty and an increased emphasis on therapeutic cell and molecular engineering aimed at drug discovery and disease mechanisms. It was felt that this was critical for recruiting new faculty and for developing a more structured curriculum with enhanced course offerings. The formation of the new department will satisfy these requirements in a new and innovative manner that will benefit a broad range of different researchers.

### **Research in the Department of Bioengineering and Therapeutic Sciences**

Figure 1 shows the five proposed research focus areas for the new department. As seen in the diagram, there is overlap among them and many of the faculty could be classified in more than one area. It is this synergy that forms the strength of integrating their activities and will lead to the formation of a cohesive unit.

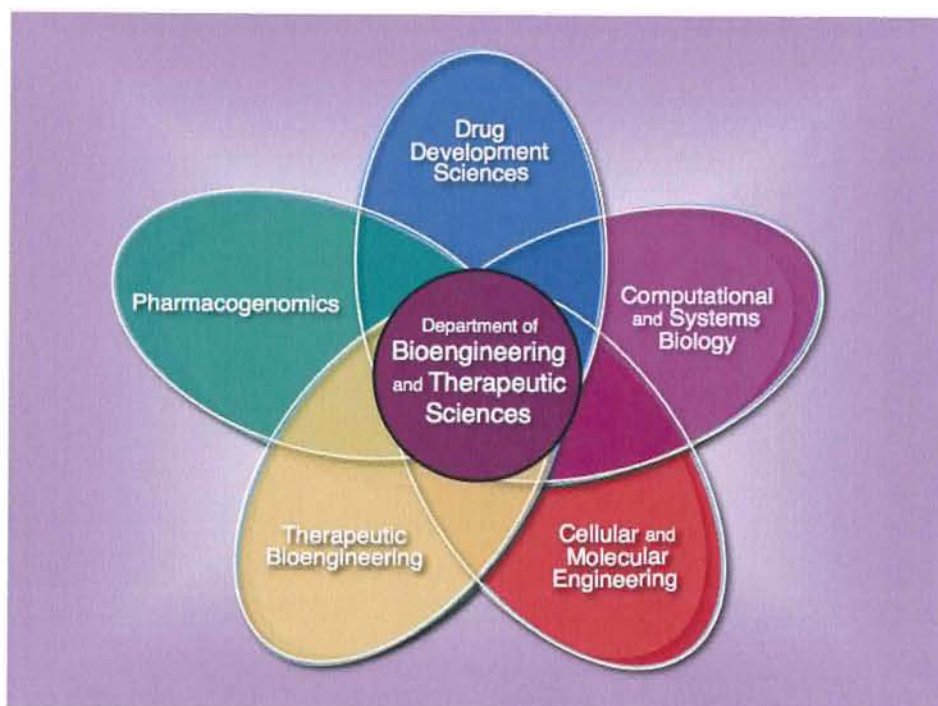


Figure 1: The five major proposed research areas in the Department of Bioengineering and Therapeutic Sciences.

### Drug Development Sciences

Development of a new drug requires evaluation of its safety and efficacy through a long process that begins with pre-clinical studies and extends through the life cycle of the drug in the post-marketing setting. Pre-clinical evaluation includes an analysis of the drug's absorption, distribution, metabolism, and excretion characteristics and of its toxicity. These studies range from the initial *in silico* investigations to *in vitro* and then *in vivo* experiments that focus on selection of the optimum drug for development. Clinical analyses of safety and efficacy of a candidate drug requires studying its pharmacokinetic and pharmacodynamic properties in patient populations. Effective biomarkers for efficacy and safety must be selected early in the process of drug development and monitored throughout clinical trials. Clinical trial design is also complex, requiring population based modeling and simulation. Finally a thorough knowledge of regulatory science is needed to optimize the drug development process. Faculty in BTS have expertise in the areas that support drug development sciences and add to the huge body of scientific knowledge that serves as an underpinning for the drug development pipeline. Research in the department includes pre-clinical drug studies in both *in vitro* and animal models, clinical trial design and analysis, modeling, simulation and regulatory sciences. The Drug Studies Unit (DSU) will be housed in BTS. This unit focuses on developing and applying drug analytical methods using modern methods such as LC-MS-MS. The Center for Drug Development Science (CDDS) focuses on pharmacokinetic/dynamic modeling and regulatory sciences. Housed at the UC Washington Center, CDDS interacts closely with pharmaceutical industry and the Food and Drug Administration.

### Pharmacogenomics

The large amount of publicly available human DNA sequence data and rapid advances in genomic technologies have stimulated research into the genetic basis of drug response and the use of genetic models in drug discovery and development. The pharmacogenomic research interests within BTS are broad, multidisciplinary and translational. Examples of active research areas include: a large multi-investigator program in membrane transporter pharmacogenetics, and individual projects in asthma, diabetes, HIV and cancer pharmacogenetics. These efforts involve the discovery of novel polymorphisms in drug response genes, functional characterization of genetic polymorphisms using heterologous expression systems and model organisms, and clinical studies to examine the effect of genetic variation on drug response and toxicity and the influence of racial admixture on these effects. Studies are also ongoing to explore the functional significance of highly conserved genomic regions using mice and zebrafish as model systems. Zebrafish are also being used to identify factors regulating the activity and toxicity of neuroactive agents. Finally, DNA microarrays are being used to study gene expression patterns (genetic signatures) in human tumors and to aid in the development of diagnostics and therapeutics for the treatment of cancer.

### Therapeutic Bioengineering

The unique opportunities for interactions between basic and clinical scientists that exist at UCSF have allowed numerous advances in the development of new treatment strategies, as well as novel methods of delivering and evaluating cell and drug-based therapies. Bioengineering has a major role to play in terms of developing new probes for tissue targeting, designing sensors of biological activity to evaluate normal and abnormal physiology, fabricating tissue replacements and drug delivery devices, and computational modeling of disease processes. Researchers at UCSF seek to advance therapeutics by engineering novel material and devices at the cellular and subcellular level. Such technologies may ultimately be used to treat cancer, neurodegenerative diseases, diabetes, and blood/immune disorders. Specific areas of interest are:

- Mechanisms for delivering novel drug and gene therapies that take advantage of specific biological and biochemical properties of the disease with minimal impact upon surrounding normal tissue.
- Developing biocompatible and biological materials as part of functional implant systems for tissue replacement, including the use of stem cells and gene therapy.

- Determining the fundamental principles by which cells and extracellular matrix respond to physical loading and how mechanical factors influence tissue development, injury, repair, and remodeling.
- Developing new probes for tissue characterization, diagnosis and evaluation of response to therapy using methodologies such as genomics and proteomics.
- Designing novel instrumentation and computer-aided simulations for optimizing invasive procedures such as robotic surgery, intra-operative monitoring and delivering focal therapy.

#### Computational and Systems Biology

Computational biologists in the new BTS are concerned with the folding, function, evolution, and design of proteins. They are developing and applying computational methods for prediction of protein structure and function, for mapping evolution of protein sequences and their functions, and for designing proteins with desired structure and function. In collaboration with others, these methods facilitate the study of individual biological systems, drug discovery, pharmacogenomics and pharmaceutical sciences, systems biology, and synthetic biology. Their research is closely aligned with that of systems biologists who study the mechanisms underlying complex biological processes as integrated systems of many, diverse, interacting components. As such, systems biology has wide applications in the diagnosis and treatment of complex diseases, the design of new generation drugs, and in future therapeutics. Current research in BTS includes quantitative study and modeling of biomolecular networks, designing and engineering new pathways, and study of evolution of protein interactions and pathways. Future directions may be in mathematical and computational analysis of complex biological systems, modeling complex diseases, quantitative study of physiological systems; systems level study of drug response, metabolic networks, and synthetic biology.

#### Cellular and Molecular Engineering

This area encompasses current strengths in deciphering molecular function, designing new interacting molecules, analyzing and designing enzymes, pathways and networks. The goal is to engineer sub-cellular, cellular and synthetic systems for basic biological research, diagnostic applications or delivery devices. The development of ultra-high resolution light and fluorescence imaging technologies will contribute to the understanding of interactions between single and multiple assemblies of cells and to the discovery of new cell-based therapeutics. Molecular and cellular engineering interfaces with computational and systems biology in modeling, design and simulation of structure and function of biological systems on all scales. The new department will also facilitate synergistic interactions with translational efforts in the area of therapeutic bioengineering. Specific areas of interest include:

- Understanding how the molecular machinery in cells functions at the atomic level to study cellular organelles, molecular motors, biological membranes and individual proteins.
- Developing techniques of genomics and proteomics for analyzing whole genome complements of proteins and transcripts.
- Theoretical modeling of protein structures, protein function and interacting systems of molecules that include signaling networks, molecular machines and membrane proteins.
- Designing molecules with specific biological or functional properties for understanding drug transport and developing novel approaches to drug delivery.

### **Educational Activities of the Department of Bioengineering and Therapeutic Sciences**

#### **GRADUATE STUDENT EDUCATION**

The new department will act as the administrative and financial home for the PSPG (Pharmaceutical Sciences and Pharmacogenomics), BMI (Biological and Medical Informatics), JGGB (UCSF/UCB Joint Graduate Group in Bioengineering) graduate programs, and the administrative home for the Biophysics graduate program, which span many departments at various UCSF campus locations, and in the case of Bioengineering, operates cross-campus with UCB. Many faculty members will also have affiliations with other graduate programs such as PIBS (Program in Biological Sciences), Chemistry and Chemical Biology, Biomedical Sciences, and Neuroscience. Since most BTS faculty are affiliated with at least two of the graduate programs, the new Department will facilitate the governance, administration and

coordination of these programs on the UCSF campus. Departmental faculty will have major responsibilities in teaching and curriculum development at the graduate level.

#### BMI - Biological and Medical Informatics Program

The development of the current Biological and Medical Informatics program began in 1997 and led to the creation of tracks in basic biology and medical sciences. The focus for faculty in BTS will be the Biological Informatics (BI) component, which has its own training grant and recruitment process. There are 23 faculty members in this track from six departments whose mission is to train students from quantitative backgrounds in computer science, mathematics and statistics, whose interests are aimed at performing research at the interface of biology, computation and informatics. There are currently 29 students in the program, with expected incoming classes of 6-10 students per year. To enhance the range of training opportunities that are available to their students, the BI group has formed an alliance with faculty focused on Biophysics and Systems Biology to develop a core curriculum for training students in quantitative biology. The recent HHMI/NIBIB Interfaces Grant Program that was designed to sponsor graduate training programs in interdisciplinary research has funded curriculum development. This includes boot camps in biology, mathematics and computation, as well as team challenges that teach students to rely upon interdisciplinary collaboration to solve complex biological questions. Electives in algorithm design, objective oriented programming, statistical methods in bioinformatics and scientific software development ensure that the students get exposure to quantitative analysis methodology. A new Bioinformatics track in Quantitative Genetics / Genomics is under development in collaboration with the Institute for Human Genetics, and is expected to attract students with interests in statistical and population genetics and related areas. New courses under development, along with core courses in IPQB, will form the core curriculum.

#### JGGB - UCSF/UCB Joint Graduate Group in Bioengineering

The close proximity of UCSF and UCB has fostered numerous collaborations among faculty members on the two campuses with regard to developing quantitative approaches to addressing fundamental problems in biological and clinical sciences. In the early 1980's scientists who were heavily involved in these interactions on the two campuses proposed the formation of the UCSF/UCB Joint Graduate Group in Bioengineering (JGGB). This fully integrated educational program was approved in 1983 and is authorized to offer Ph.D. degrees that are conferred jointly by the Graduate Divisions of both campuses. Over the past twenty-three years the JGGB has become one of the pre-eminent educational programs in the country and is well known for the diversity and excellence of the training it provides. Its objective is to teach doctoral students to bring the methods of modern engineering to bear on problems in biology and medicine, and to learn how to teach others to do the same. This combination of expertise is very much in demand in academia and in industry, and provides a wide range of employment opportunities to graduates of the JGGB. Of particular interest to students is the multi-disciplinary environment that is provided by the two campuses, which means that the breadth and depth of the training offered to students is of an order larger than a single department could provide. Faculty in the JGGB come from more than twenty departments in the professional schools at UCSF, six departments from the College of Engineering at UCB and several non-engineering departments. Hence, there is a wide array of research opportunities and state-of-the art facilities available to the students.

#### PSPG - Pharmaceutical Sciences & Pharmacogenomics Graduate Program

The graduate program leading to a Ph.D. in Pharmaceutical Sciences & Pharmacogenomics (PSPG) is multidisciplinary. It has a dual focus on Pharmaceutical Sciences, which includes the scope of disciplines from chemistry to biology and from pharmacology to bioinformatics that are involved in the discovery and development of medications, and Pharmacogenomics, which covers the application of genetics and genomics to drug action and disposition. The 51 faculty members in the program come from both the School of Pharmacy and the School of Medicine. There are currently 51 graduate students in the program and of those students who have selected research advisors, 24 are mentored in SOP laboratories and 19 are mentored in SOM laboratories. The program is based at Mission Bay but there are a significant number of faculty and students at Parnassus and at other UCSF locations. The PSPG program is partially funded by a NIH training grant. The graduates are highly sought after and upon



completion of their thesis, 39% of the graduates go into academic positions or postdoctoral fellowships, 44% go into industry; the remainder goes into other health related occupations.

### Biophysics Graduate Program

The Biophysics program spans research at the interface of physics, biology and chemistry. This interdepartmental group consists of 60 students and 45 faculty members, drawn from a variety of fields employing biophysical and computational techniques. Opportunities for research projects cover a broad spectrum from macromolecular structure to cell biology, chemical biology and computational neuroscience. The structure of receptors, motors and enzymes, understanding their mechanisms of action, and the design of small molecules that can target these proteins is the focus of a large number of experimental and theoretical investigations. In many cases, several laboratories collaborate to tackle multiple facets of such challenging problems. Protein folding pathways and the role of dynamics in defining function is an area of intense investigation, as is the study of structure and dynamics of RNA, DNA and their complexes with proteins and drugs. At the cellular level, studies include the mechanism, structure and function of chromosomes and centrosomes, the nucleation and regulation of the actin cytoskeleton, the structure and mechanism of myosin and kinesin motors, the mechanism of protein translocation and membrane channels. A growing emphasis is being placed on the role of synthetic chemistry in biology and of bioinformatics.

**TABLE 1: GROWTH PATTERN FOR GRADUATE PROGRAMS**

Years	BMI	PSPG	UCSF/UCB JGGB	Biophysics
Enrollment 2006-07	30	51	60*	62
Enrollment 2007-08	34	53	69*	61
Enrollment 2008-09	37	57	79*	64

\*Enrollment for JGGB based on UCSF Home Campus, total UCSF-UCB enrollment is 170.

### PROFESSIONAL STUDENT EDUCATION

The department will have key educational responsibilities in the School of Pharmacy's Doctor of Pharmacy (PharmD) program. In particular, BTS will be responsible for required courses in drug absorption, dosage formulations and drug delivery, pharmacokinetics-pharmacodynamics, bioinformatics and pharmaco-genetics. In addition, BTS plans to offer a new course for professional students in all Schools in the subject of Bioengineering and Therapeutic Sciences. Such a multi-disciplinary didactic course will provide education on new technologies and approaches to prevention, diagnosis and treatment of human diseases.

**TABLE 2: PROFESSIONAL STUDENT COURSES**

Number	Course
BPS 111	Biopharmaceutics
BPS 112	Biostatistics
BPS 113	Drug Delivery Systems
BPS 114	Bioinformatics
BPS 115	Genetics and Pharmacogenetics
BPS 121/122	Pharmacokinetics
BPS 133	Pharmacokinetics in Drug
BPS 134	Research Design and Statistics in Drug
BPS 135	Principles of Pharmacogenomics
New	Introduction to Bioengineering and Therapeutic Sciences

## Interactions with other Schools, Departments and Programs

The department plans to enhance interactions with other schools, departments and programs. A number of other departments in the two Schools will be interested in recruiting new faculty with joint appointments or will have faculty who are interested in having WOS positions in BTS. These include the Departments of Radiology, Orthopedic Surgery, Cellular and Molecular Pharmacology, Surgery, Otolaryngology, Medicine, Physiology and Pharmaceutical Chemistry. The new department will be open to such collaborations and sensitive to making sure that there are consultations with other units for recruitments that might be of mutual interest. A memorandum of understanding has already been instituted to establish the relationship between BTS and the Department of Radiology in this respect. The strategic alliance that has resulted from this agreement has been extremely positive. There are also numerous areas of common interest with the QB3 Institute, major components of the CTSI such as the Translational Technology Resources and Strategic Opportunity Support Center, the Institute for Regenerative Medicine, the Program in Human Genetics, the Cancer Center and the Cardiovascular Research Institute.

The goal of BTS will be to encourage interactions with these units, and to participate in joint grant applications and fund raising initiatives. While it is clear that there is a strong focus for the new department on the Mission Bay campus and this has been the focus for new recruitment, there are a number of programs at Parnassus actively engaged in research that is relevant to bioengineering and therapeutic sciences. Once the new department is formed it will investigate the potential for using some of its existing laboratory space on the Parnassus campus to create a focus for faculty and students to share resources and apply cutting edge technologies in a clinical setting. Further, the Department plans to interact with the Schools of Dentistry and Nursing. In particular, without salary appointments will be considered with key School of Dentistry faculty members who are carrying out research in Bioengineering and who participate in the graduate program. School of Nursing interactions are undefined at this point, but the professional student course and graduate courses will be open to students in the School.

## Structure of the New Department

**Formation** - As degree-granting authority already exists, the process for establishing the Department is a purely local one. It requires that the Deans of the Schools of Medicine and Pharmacy identify the resources needed to support the Department, agree upon how these will be managed and obtain approval for the proposed structure from the Academic Senate.

**Leadership** - The new department will be led by co-chairs representing the mission of the two schools and appointed jointly by the Deans. The normal stewardship review and evaluation criteria will be applied. The co-chairs may appoint vice chairs as needed to oversee research, teaching and other academic functions of the department. The co-chairs will be responsible to both deans and may participate in committees associated with both schools.

**TABLE 3: PERSONNEL IN BTS (SEE APPENDIX D1)**

Academic		Administrative		Laboratory	
Salaried faculty positions	26	Manager	5	Staff Research Assoc	17
Graduate Students in Training Programs	217	Analysts	15	Laboratory Assistants	8
Graduate Students in Labs (subset of 217)	31	Admin Assistants	8	Programmer Analysts	5
Post-doctoral Scholars	41				
Specialist, Researcher, Scientist, Academic Coord	30				
<b>Total</b>	<b>345</b>		<b>28</b>		<b>30</b>

**Faculty** - BTS will have 20 faculty FTEs at its inception of which 4 are unfilled. Bioengineering began a search for 3 faculty FTEs in January 2003; 2 have been filled and are temporarily housed in Physiology, and the third position is under negotiation with a promising candidate. Twelve additional faculty who are currently in the Program in Bioengineering have primary appointments in other departments, one being the proposed co-chair and 11 others, who will have WOS appointments in BTS. Of the 17 state funded FTEs in the current Department of BPS, 3 are currently under recruitment and will be used to further the goals of the new department. There are also 4 non-FTE salaried positions, 1 Professor Emeritus who is on recall and 33 faculty having WOS positions in BPS. As the graduate and professional student bodies continue to grow and lead to more faculty FTEs coming to the institution, it is proposed that a minimum of three additional faculty will be added. The ongoing and proposed recruitments will involve a full PIBS/PIQS search, with participation on the search committee from faculty at UCSF who represent a broad range of research areas. While there may be some adjustment over time, the current plans are to focus on individuals who represent the five research focus areas and whose programs are complementary to those of the existing faculty.

**Staff** - The management will integrate individuals from the two structures to create a stand-alone departmental organization. The merger comes at a time when the School of Pharmacy is decentralizing some of its functions and hence provides an opportunity to re-examine the infrastructure that existed in BPS. As the first department that spans two schools at UCSF there is no precedent for the organizational structure and we anticipate there will need to be a transition period with some adjustment of effort as the process evolves. Appendix B contains a diagram that represents the staffing required to support the department. The decision to integrate the current structures under a single MSO is a strategic move to ensure that the infrastructure for the new department is cohesive. This individual will report to the co-chairs of the department and be fiscally responsible to the financial managers from both schools. Key aspects for providing support to the faculty are the administrative services, financial, purchasing and grants management. These functions will have central oversight, but each member of the staff will work closely with small groups of faculty. Critical functions that will be expanded as a result of the merger and will require the recruitment of new staff are the management of finances arising from a combination of support from the two schools and faculty grants, human resources and the development of programmatic efforts associated with industry collaborations, large grant applications and continuing education courses.

### **SOP and SOM Faculty Policies: Compensation Plan and Teaching Responsibilities**

The differences in compensation plans and teaching responsibilities between the two groups of faculty need to be addressed. A committee of senior faculty will be appointed to define expectations and propose plans that take account of the broad range of research being performed and the needs of both schools. Some faculty members are likely to have close interactions with industry and so it will be important that the implications of consulting with for-profit entities and commercialization of new discoveries are clearly understood. While participation in graduate student education is a requirement for faculty in both schools, the current expectations for the number of hours devoted to teaching medical and pharmacy students need to be reconciled and a common strategy developed. The committee will also address recommendations for guidelines to define the expectations for joint and WOS faculty appointments. The proposals for compensation plans, teaching responsibilities and expectations for joint appointees will be presented to and voted upon by the academic senate faculty who have primary appointments in the department.

### **Financial Resources and Responsibilities**

The budget to meet the academic mission of BTS is estimated to grow from 5.1 million in 2007-2008 to 8.3 million in 2016-2017. (see Appendix C) Table 4 shows the percent of revenue from the contributing resources. In addition to pledges of on-going support from the SOM and SOP Deans' Offices, BTS receives 19900 funding, indirect cost recovery, research grants funding for faculty salaries and benefits,

and income from special projects (such as course revenue). Initially, the department infrastructure will also support 22 faculty research grant portfolios.

**TABLE 4: REVENUE SOURCES BY PERCENT AND BY DOLLAR**

Revenue Source	Revenue by Percent		Revenue by Dollar	
	FY 07-08	FY 16-17	FY 07-08	FY 16-17*
BTS 19900 Funds	39%	34%	1,961,001	2,851,994
BTS Indirect Cost Recovery, Contracts & Grants toward faculty salary & benefits	35%	44%	1,754,738	3,695,804
BTS Additional Revenues*	4%	3%	226,331	225,696
Total SOP Dean's office	17%	15%	887,828	1,210,019
Total SOM Dean's office	5%	4%	250,000	340,724
<b>TOTAL REVENUE</b>	<b>100%</b>	<b>100%</b>	<b>5,079,899</b>	<b>8,354,237</b>

\*Comprised of Course revenues and, in initial years, residual 1-time start-up and administrative monies from BioE FTEs.

\*Totals in FY 16-17 are determined assuming a 3.5% annual increase in expenses and operating revenue.

BTS will be in the unique position of providing supervisory services to 9 campus wide programs and financial services to 8 campus wide programs that are integral to the teaching and research mission of UCSF (see Table 5). This increases the financial management responsibility of the department by an additional \$14.5 million. While the programs have a variety of funding sources, each will draw on the department's infrastructure. In the case of graduate programs, there will be an opportunity for cohesive administrative structures, while other programs require individually-tailored supervision and financial management support (see Organizational Chart in Appendix B).

**TABLE 5: CAMPUS-WIDE PROGRAMS LOCATED IN BTS**

Program	Number of Funds	Budget
Graduate Programs		
Pharmaceutical Sciences & Pharmacogenomics	10	1,996,723
Biological and Medical Informatics Program	13	1,152,109
Biophysics	12	n/a
Bioengineering	12	3,617,390
Clinical and Translational Science Institute Programs		
Translational Technologies and Resources	1	307,600
Strategic Opportunity Support	25	1,092,113
Resource Allocation Program	5	1,466,540
Center for Drug Development Sciences	5	860,645
Drug Studies Unit		4,139,687
<b>Totals</b>	<b>83</b>	<b>14,632,807</b>

## Space

Appendix D2 details the space available to the new department. Total space available is 47,259 sq. ft. Of this, 13% comes from the Program in Bioengineering, and 85% from BPS. Of this total space, 26% is shared. The 'loaned space' comprises 43%, and 'assigned space' comprises 57%. Research space is 70% of the total space. At Mission Bay Campus, available space for the department is nearly fully occupied, however some space on the Parnassus Campus is available, and an ad hoc committee will be formed to plan for the optimum use.

**TABLE 6: COMBINED SOM & SOP SPACE**

<b>Campus / Building</b>	<b>Lab</b>	<b>Other</b>	<b>Assigned</b>	<b>Loaned</b>	<b>% Shared</b>	<b>Total</b>
<b>MISSION BAY CAMPUS</b>						
Byers Hall	5,293.97	5,033.74	0	10,327.71	62.44	10,327.71
Rock Hall	5,326.23	2,125.86	6,630.09	822.00	64.63	7,452.09
Genentech Hall	733.96	534.50	1,080.46	188.00	72.41	1,268.46
<b>Total Mission Bay Campus</b>	<b>11,354.16</b>	<b>7,694.10</b>	<b>7,710.55</b>	<b>11,337.71</b>	<b>63.96</b>	<b>19,048.26</b>
<b>PARNASSUS CAMPUS</b>						
Health Sciences East	7775.00	510.00	8285.00	0	0	8,285.00
Medical Sciences	4488.00	2894.00	7382.00	0	2.70	7,382.00
University Hall	2244.00	1099.69	3344.09	0	2.90	3,344.09
<b>Total Parnassus Campus</b>	<b>14,507.00</b>	<b>4,503.69</b>	<b>19,011.09</b>	<b>0</b>	<b>1.56</b>	<b>19,011.09</b>
<b>OTHER</b>						
Lawrence (So. S.F.)	7420.00		0	7420.00	0	7,420.00
Washington DC		1780.00	0	1780.00	0	1,780.00
<b>Total Other</b>	<b>7,420.00</b>	<b>1,780.00</b>	<b>0</b>	<b>9,200.00</b>	<b>0</b>	<b>9,200.00</b>
<b>Total BioE / SOM</b>	<b>4,038.00</b>	<b>2,334.00</b>	<b>00.00</b>	<b>6,372.00</b>	<b>31.00</b>	<b>6,372.00</b>
<b>Total BPS / SOP</b>	<b>29,243.56</b>	<b>11,643.79</b>	<b>26,721.60</b>	<b>14,165.71</b>	<b>69.00</b>	<b>40,887.35</b>

**Benefits**

Obvious challenges exist in proposing the creation of a joint partnership between both schools and campuses; these include but are not limited to: administration, areas of research focus, student educational programs, partnerships with community and private sectors. The benefits shown below apply to the merging units and to UCSF as a whole.

**Students**

- Innovative courses by dedicated faculty, in core areas of bioengineering with a deeper biomedical research focus
- Additional opportunities for dissertation research that balances engineering and clinical projects
- Increased financial support through additional sources of funding, extramural / interdisciplinary

**Faculty**

- Provides an improved network of peers for collaboration and research
- Increases visibility of research in all departments both nationally and internationally
- Establishes credibility amongst other bioengineering programs to improve competitive position in obtaining grants

**UCSF**

- Builds upon UCSF's leadership position in providing innovative programs and research opportunities
- Stimulates partnerships with other academic institutions, community and the private sector, including industry
- Encourages donations and funding from private foundations and organizations that encompass interdisciplinary research areas with an aim to advancing biomedical research and developing new technologies to improve patient care.

**Summary**

The creation of a new Department of Bioengineering and Therapeutic Sciences will provide a home for research and educational programs in bioengineering and pharmaceutical sciences at UCSF. The UCSF portion of the joint graduate program with UC Berkeley will be housed and managed in the new department. Research in the department will complement research at UC Berkeley and provide a fresh and unique UCSF focus to bioengineering that includes a major emphasis on translational research. A visionary department that captures strengths in both schools into a single joint department at UCSF will position UCSF as a leader in the field.

## APPENDIX A: FACULTY ROSTERS

### 1. Proposed Faculty SOM-SOP Department of Bioengineering and Therapeutic Sciences (BTS)

Faculty	Position	School & Department	Status
Kathleen Giacomini, PhD	Professor and Chair	SOP-SOM BTS - FTE	S
Sarah Nelson PhD	Professor and Chair	SOP-SOM BTS / SOM Radiology - FTE	S
Patricia Babbitt, PhD	Professor	SOP-SOM BTS - FTE	S
Leslie Benet, PhD	Professor	SOP-SOM BTS - FTE	S
Frances Brodsky, PhD	Professor	SOP-SOM BTS - FTE	S
Betty Hoener, PhD	Professor Emeritus	SOP-SOM BTS	Recall
C. Anthony Hunt, PhD	Professor	SOP-SOM BTS - FTE	S
Tejal Desai PhD	Professor	SOP-SOM BTS - FTE	S
Deanna Kroetz, PhD	Professor	SOP-SOM BTS - FTE	S
Andrej Sali, PhD	Professor	SOP-SOM BTS - FTE	S
Francis Szoka, PhD	Professor	SOP-SOM BTS - FTE	S
Chao Tang, PhD	Professor	SOP-SOM BTS - FTE	S
Davide Verotta, PhD	Professor in Residence	SOP-SOM BTS	S
Ellen G. Feigal, MD	Adjunct Professor	SOP-SOM BTS	S
Tanja Kortemme, PhD	Assistant Professor	SOP-SOM BTS	S
Esteban Burchard, MD MPH	Assistant Professor	SOP-SOM BTS - FTE	S
Xin Chen, PhD	Assistant Professor	SOP-SOM BTS - FTE	S
Su Guo, PhD	Assistant Professor	SOP-SOM BTS - FTE	S
Nadav Ahituv, PhD	Assistant Professor	SOP-SOM BTS - FTE	S
Mats Gustafsson PhD	Assistant Professor	SOP-SOM BTS - FTE	S
Yong Huang, PhD	Assistant Adjunct Professor	SOP-SOM BTS	S
Howard Lee, MD, PhD	Associate Adjunct Professor	SOP-SOM BTS	S
Nancy Sambol, PharmD	Associate Clinical Professor	SOP-SOM BTS	S
FTE-BioE		SOP-SOM BTS - FTE	S
FTE-BPS		SOP-SOM BTS - FTE	S
FTE-BPS		SOP-SOM BTS - FTE	S
FTE-BPS		SOP-SOM BTS - FTE (see Appendix B)	S
David Agard PhD	Professor	SOM Biochemistry & Biophysics; BTS	WOS
Roger Cooke PhD	Professor	SOM Biochemistry & Biophysics; BTS	WOS
Jeffrey Lotz PhD	Professor	SOM Orthopaedic Surgery; BTS	WOS
Sharmila Majumdar PhD	Professor	SOM Radiology; BTS	WOS
Wendell Lim, PhD	Professor	SOM Cellular & Molecular Pharmacology; BTS	WOS
Michael Stryker PhD	Professor	SOM Physiology; BTS	WOS
Christoph Schreiner MD PhD	Professor	SOM Otolaryngology; BTS	WOS
Daniel Vigneron PhD	Professor	SOM Radiology; BTS	WOS
Ken A Dill, PhD	Professor	SOP Pharmaceutical Chemistry; BTS	WOS
Brian Shoichet, PhD	Professor	SOP Pharmaceutical Chemistry; BTS	WOS
Claude G Biava, MD	Professor Emeritus	SOM Pathology; BTS	Emeritus
R D Gibson, PharmD	Professor Emeritus	SOP-SOM BTS	WOS
Irwin Kuntz, PhD	Professor Emeritus	SOP-SOM BTS	WOS
Emil T Lin, PhD	Professor Emeritus	SOP-SOM BTS	WOS
Wolfgang Sadee, PhD	Professor Emeritus	SOP-SOM BTS	WOS
Thomas N, Tozer PhD	Professor Emeritus	SOP-SOM BTS	WOS
Robert A Upton, PhD	Professor Emeritus	SOP-SOM BTS	WOS
Neal L Benowitz, MD	Professor In Residence	SOM SFGH-Clinical Pharmacology; BTS	WOS
Maria Correia, PhD	Professor In Residence	SOP Cellular & Molecular Pharmacology; BTS	WOS
Charles Becker, PhD	Senate Emeritus	SOP-SOM BTS	Emeritus
Dennis Adair, PharmD PhD	Clinical Professor-Vol.	SOP-SOM BTS	WOS
Terrence Blaschke, PhD	Adjunct Professor	SOP-SOM BTS	WOS
Roger Brent, PhD	Adjunct Professor	SOP-SOM BTS	WOS

Thomas E Ferrin, PhD	Adjunct Professor	SOP Pharmaceutical Chemistry; BTS	WOS
Richard H Guy, PhD	Adjunct Professor	SOP-SOM BTS	WOS
David Haussler, PhD	Adjunct Professor	SOP-SOM BTS	WOS
Nicholas H.G.Holford, PhD	Adjunct Professor	SOP-SOM BTS	WOS
Svein Oie, PhD	Adjunct Professor	SOP-SOM BTS	WOS
Carl C Peck, MD PhD	Adjunct Professor	SOP-SOM BTS	WOS
Russell O Potts, PhD	Adjunct Professor	SOP-SOM BTS	WOS
Daniel Adrian Spyker, PhD	Adjunct Professor	SOP-SOM BTS	WOS
John Urquhart, PhD	Adjunct Professor	SOP-SOM BTS	WOS
Roger L Williams, PhD	Adjunct Professor	SOP-SOM BTS	WOS
Tamara Alliston, PhD	Assistant Professor	SOM Orthopaedic Surgery; BTS	WOS
Christopher A. Voigt, PhD	Assistant Professor	SOP Pharmaceutical Chemistry ; BTS	WOS
Saraswati Kenkare-Mitra, PhD	Assistant Adjunct Professor	SOP-SOM BTS	WOS
Scott Pegg, PhD	Assistant Adjunct Professor	SOP-SOM BTS	WOS
Matthew P. Jacobson	Associate Professor	SOP-Pharmaceutical Chemistry; BTS	WOS
Sri Nagarajan, PhD	Associate Professor	SOM Radiology; BTS	WOS
Valerie Weaver, PhD	Associate Professor	SOM Surgery; BTS	WOS
Ajay Jain, PhD	Associate Professor In Residence	SOM Cancer Research; BTS	WOS
Christopher Cullander, PhD	Associate Adjunct Professor	SOP Dean's Office; BTS	WOS
Victoria G Hale, PhD	Associate Adjunct Professor	SOP-SOM BTS	WOS
Steven Shafer, PhD	Associate Adjunct Professor	SOP-SOM BTS	WOS
Jeffrey A Silverman, PhD	Associate Adjunct Professor	SOP-SOM BTS	WOS

## **2. Current Faculty – SOM Program in Bioengineering**

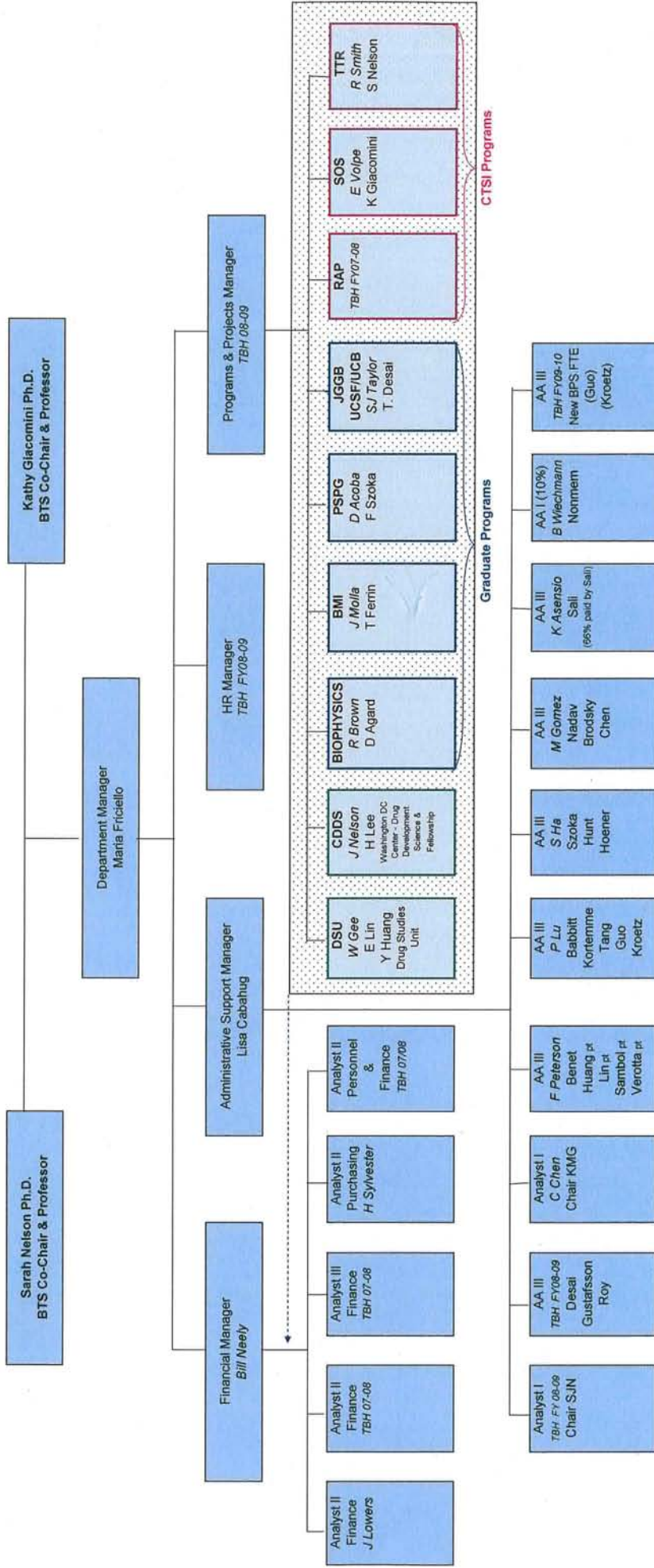
<b>Bioengineering Faculty</b>	<b>Position</b>	<b>School &amp; Department</b>	<b>Status</b>
Sarah Nelson, PhD	Professor and Director	SOM Radiology - FTE	WOS
David Agard, PhD	Professor	SOM Biochemistry & Biophysics	WOS
Roger Cooke, PhD	Professor	SOM Biochemistry & Biophysics	WOS
Tejal Desai, PhD	Professor	SOM Physiology - FTE	S
Wendell Lim, PhD	Professor	SOM Cellular & Molecular Pharmacology	WOS
Jeffrey Lotz, PhD	Professor	SOM Orthopaedic Surgery	WOS
Sharmila Majumdar, PhD	Professor	SOM Radiology	WOS
Michael Stryker, PhD	Professor	SOM Physiology	WOS
Christoph Schreiner, MD PhD	Professor	SOM Otolaryngology	WOS
Daniel Vigneron, PhD	Professor	SOM Radiology	WOS
Tamara Alliston, PhD	Assistant Professor	SOM Orthopaedic Surgery	WOS
Mats Gustafsson, PhD	Assistant Professor	SOM Physiology - FTE	S
Sri Nagarajan, PhD	Associate Professor	SOM Radiology	WOS
Valerie Weaver, PhD	Associate Professor	SOM Surgery	WOS
FTE-Bioengineering		SOP-SOM BTS - FTE	S



### 3. Current Faculty – SOP Department of Biopharmaceutical Sciences

BPS Faculty	Position	School & Department	Status
Kathleen Giacomini, PhD	Professor and Chair	SOP Biopharmaceutical Sciences - FTE	S
Patricia Babbitt, PhD	Professor	SOP Biopharmaceutical Sciences - FTE	S
Leslie Benet, PhD	Professor	SOP Biopharmaceutical Sciences - FTE	S
Frances Brodsky, PhD	Professor	SOP Biopharmaceutical Sciences - FTE	S
Betty Hoener, PhD	Professor Emeritus	SOP Biopharmaceutical Sciences	Recall
C. Anthony Hunt, PhD	Professor	SOP Biopharmaceutical Sciences - FTE	S
Deanna Kroetz, PhD	Professor	SOP Biopharmaceutical Sciences - FTE	S
Andrej Sali, PhD	Professor	SOP Biopharmaceutical Sciences - FTE	S
Francis Szoka, PhD	Professor	SOP Biopharmaceutical Sciences - FTE	S
Chao Tang, PhD	Professor	SOP Biopharmaceutical Sciences - FTE	S
Davide Verotta, PhD	Professor in Residence	SOP Biopharmaceutical Sciences	S
Ellen G. Feigal, MD	Adjunct Professor	SOP Biopharmaceutical Sciences	S
Nadav Ahituv, PhD	Assistant Professor	SOP Biopharmaceutical Sciences - FTE	S
Esteban Burchard, PhD MPH	Assistant Professor	SOP Biopharmaceutical Sciences - FTE	S
Xin Chen, PhD	Assistant Professor	SOP Biopharmaceutical Sciences - FTE	S
Su Guo, PhD	Assistant Professor	SOP Biopharmaceutical Sciences - FTE	S
Tanja Kortemme, PhD	Assistant Professor	SOP Biopharmaceutical Sciences - FTE	S
Yong Huang, PhD	Assistant Adjunct Professor	SOP Biopharmaceutical Sciences	S
Howard Lee, MD PhD	Associate Adjunct Professor	SOP Biopharmaceutical Sciences	S
Nancy Sambol, PharmD	Associate Clinical Professor	SOP Biopharmaceutical Sciences	S
FTE-BPS		SOP-SOM BTS - FTE	S
FTE-BPS		SOP-SOM BTS - FTE	S
FTE-BPS		SOP-SOM BTS - FTE (see Appendix B)	S
Ken A Dill, PhD	Professor	SOP Pharmaceutical Chemistry	WOS
Brian Shoichet, PhD	Professor	SOP Pharmaceutical Chemistry	WOS
Claude G Biava, MD	Professor Emeritus	SOM Pathology	Emeritus
R D Gibson, PharmD	Professor Emeritus	SOP Biopharmaceutical Sciences	WOS
Irwin Kuntz, PhD	Professor Emeritus	SOP Pharmaceutical Chemistry	WOS
Emil T Lin, PhD	Professor Emeritus	SOP Biopharmaceutical Sciences	WOS
Wolfgang Sadee, PhD	Professor Emeritus	SOP Biopharmaceutical Sciences	WOS
Thomas N, Tozer, PhD	Professor Emeritus	SOP Biopharmaceutical Sciences	WOS
Robert A Upton, PhD	Professor Emeritus	SOP Biopharmaceutical Sciences	WOS
Neal L Benowitz, MD	Professor In Residence	SOM SFGH-Clinical Pharmacology	WOS
Maria Correia, PhD	Professor In Residence	SOP Cellular & Molecular Pharmacology	WOS
Charles Becker, PhD	Senate Emeritus	SOP Biopharmaceutical Sciences	Emeritus
Dennis Adair, PharmD, PhD	Clinical Professor-Vol.	SOP Biopharmaceutical Sciences	WOS
Terrence Blaschke, PhD	Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Roger Brent, PhD	Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Thomas E Ferrin, PhD	Adjunct Professor	SOP Pharmaceutical Chemistry	WOS
Richard H Guy, PhD	Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
David Haussler, PhD	Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Nicholas H.G. Holford, PhD	Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Svein Oie, PhD	Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Carl C Peck, MD PhS	Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Russell O Potts, PhD	Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Daniel Adrian Spyker, PhD	Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
John Urquhart, PhD	Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Roger L Williams, PhD	Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Christopher A. Voigt, PhD	Assistant Professor	SOP Pharmaceutical Chemistry	WOS
Saraswati Kenkare-Mitra, PhD	Assistant Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Scott Pegg, PhD	Assistant Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Matthew P. Jacobson	Associate Professor	SOP Pharmaceutical Chemistry	WOS
Ajay Jain, PhD	Associate Professor In Residence	SOM Cancer Research	WOS
Christopher Cullander, PhD	Associate Adjunct Professor	SOP Dean's Office	WOS
Victoria G Hale, PhD	Associate Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Steven Shafer, PhD	Associate Adjunct Professor	SOP Biopharmaceutical Sciences	WOS
Jeffrey A Silverman, PhD	Associate Adjunct Professor	SOP Biopharmaceutical Sciences	WOS

Department of Bioengineering and Therapeutic Sciences  
Administrative Organizational Chart





BTS PERSONNEL COUNT

Space	Academic HR											Staff HR							Space			
	Faculty	Grad Stud	Postdocs	Research	Specialist	Scientist	Acad Coor	Total Acad	SRA/Asst	PA	Lab Total	AA III	AA/II	Analys	Mgr	Admin Total	Total Staff	Total Pers	% Pers	100%	Shared	Total
																				ASF	ASF	ASF
<b>Byers Hall</b>																						
BioE Grad -SJ		(69)																				
Taylor																						
Desai	1	(8)	3	1	1			6						1	1	1	1	1				715.00
Gustafson	1	(3)				1		2														499.00
Neison	1							1														2,505.00
FTE TBH	1							1														1,694.00
MSO Space	1							1														220.00
Analyst - Jeffrey																						142.00
TTR - Robert																						119.00
open																						114.00
(Debbie- PSPG)																						114.00
Total BioEng	4	(69)	3	1	1	1	0	10						1	0	4	0	5	5			2,572.00
Babbitt	1	(3)	3	1				5						1	1	1	2	7				331.00
Kortemme	1	(1)	2		1			4						1	0	1	0	1	5			133.00
Sali	1	(4)	5	2	5			13						1	1	1	2	15				370.00
Tang	1		2		2			5														373.00
PSPG - Debbie		(53)																				
Department																						
Total BPS	4	(122)	12	3	8	0	0	27						0	2	1	3	2	0	1	0	1,207.00
Total	8	(122)	15	4	9	1	0	37						1	2	1	4	3	0	5	0	3,879.00
<b>DC</b>																						
Lee	1	0	0	0	0	0	0	1						1	1	1	1	2				1,780.00
Total	1	0	0	0	0	0	0	1						1	1	1	1	2				1,780.00
<b>Genentech</b>																						
BMI - Julia		(34)						(29)														
Biophysics-																						
Rebecca		(61)																				
Departmental																						
Total	0	(95)	0	0	0	0	0							0	0	0	0	2	2	2		188.00
<b>HSE</b>																						
Hunt	1	(1)	1					2														629.00
Huang/DSU	1				6			7														1,003.50
*Nadav	1							1														0.00
Szoka	1	(5)	4		1			6						1	1	1	2	10				3,444.00
(Benel)																						292.50
Department																						
Total	4	(1)	5	0	7	0	0	16						7	3	1	11	2	0	0	2	8,285.00
<b>HSW</b>																						
Brodsky	1	(1)	6		2			9														
Total	1	(1)	6		2			9						1	1	1	1	0	1	10		
<b>Lawrence, So.SF</b>																						
DSU																						
Total														6	1	1	8					7,420.00
																						7,420.00

BTS PERSONNEL COUNT

Space	Academic HR										Staff HR							Space					
	Faculty	Grad Stud	Postdocs	Research	Specialist	Scientist	Acad Coor	Total Acad	SRA	Asst PA	Lab Total	AA III	AA/II	Analys	Mgr	Admin Total	Total Staff	Total PERS	% PERS	100%	Shared	Total	
																							ASF
Faculty																							
Med Science																							
Chen (Giacomini)	1							1	1	0	0	0	0	0	0	0	0	1	2	2,199.00		2,199.00	
Hoener	1						1	1	0	0	0	0	0	0	0	0	0	1	1	215.00		215.00	
SOS - Emy														1				1	1	85.00		85.00	
MSO - Maria F.																		1	1	83.00		83.00	
Adm Sup - Lisa																		1	1	123.00		123.00	
Analyst, Fin/Purch																		3	3	1,180.00		1,180.00	
Fin. Mgr																		1	1				
Department																							
Total	2	0	0	0	0	0	0	2	1	0	0	0	0	4	3	7	8	10	3,318.00	199.00	7,183.00	7,382.00	
Rock Hall																							
Burchard	1	(1)						1	0	0	0	0	0	0	0	0	0	1	1	420.00	992.59	1,412.59	
Giacomini	1		6	1			1	9	0	0	0	0	0	1	1	1	1	10	779.74	1,641.70	2,421.44		
Guo	1	(1)	6				2	9	2	0	0	0	0	0	0	0	2	11	822.00	0.00	822.00		
Kroetz	1		2				1	4	0	0	0	0	0	0	0	0	0	4	606.11	1,332.69	1,938.80		
Loaned to Pleasure.																							
Pleasure.																							
Department																							
Total	4	14	1	1	3	0	1	23	0	2	0	0	0	1	0	1	3	26	8.15	(490.5)	849.11	849.11	
UC Hall																							
Benet	1	(3)						3	1	0	0	0	0	0	0	0	0	5	2,005.00		2,005.00		
Sambol	1		1				2	2	0	0	0	0	0	0	0	0	0	2	488.00		488.00		
Verotta	1							1	2	2	0	0	0	1	1	1	3	4	409.00	58.40	467.40		
WOS	(33)							(33)	0	0	0	0	0	0	0	0	0	(33)	150.00		150.00		
Department																							
Total	3	1	0	0	2	0	0	6	1	0	2	3	1	1	0	0	2	5	11	195.00	38.69	233.69	
TBH																							
FTE TBH	3							3	0	0	0	0	0	0	0	0	0	3	3,247.00	97.09	3,344.09		
HR Mgr																							
Acad. HR and Fin.																							
Prog & Proj Mgr																							
RAP																							
AA III																							
Total	3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	8					
Total	26	(217)	41	5	23	1	1	97	17	8	5	30	7	1	15.0	5	28	58	34,780.00	12,479.35	47,259.35		
Total BioEng	4	(69)	3	1	1	1	0	10	1	0	0	1	0	1	3	2	6	7	2,672.00	3,700.00	6,372.00		
Total BPS	21	(148)	38	4	22	0	1	87	16	8	5	29	7	0	12	3	22	51	32,108.00	8,779.35	40,887.35		

NOTES:  
 Grad Students, not included in total academic count  
 \* Nadav = occupies HG space  
 \* Brodsky = occupies Hooper Foundation space

BPS  
 BioEng  
 Future  
 On loan by PharmChem

BTS SPACE ALLOCATION

Space	Academic HR		Staff HR		Pers. %	100% Occupancy						S P A C E				Total 100% Allocated & Shared ASF	
	Faculty	Total Acad	Lab	Admin		Total Staff	Research	Other	Allocated by Chancellor	Loaned by Chancellor	Total 100% ASF Occupied	Research	Other	Allocated by Chancellor	Loaned by Chancellor		Total Shared ASF
<b>Faculty</b>																	
<b>Byers Hall</b>																	
BioE Grad -SJ Taylor		(69)															
Desai	1	6	0	1	1	1	715.00	715.00		715.00						715.00	
Gustafson	1	2	1	0	2	7	383.00	116.00	499.00	499.00	1,779.00	227.00		2,006.00		2,505.00	
Nelson	1	1	0	1	2	2	383.00	116.00	499.00	499.00	1,493.00	201.00		1,694.00		2,193.00	
FTE TBH	1	1	0	1	2	2	220.00	220.00		220.00						220.00	
MSO	1	1	0	0	1	1	142.00	142.00		142.00						142.00	
Analyst - Jeffrey			0	0	0	0	119.00	119.00		119.00						119.00	
TTR - Robert			1	1	1	1	114.00	114.00		114.00						114.00	
open			1	1	1	1	114.00	114.00		114.00						114.00	
(Debbie- PSPG)						0	136.00	136.00		136.00						136.00	
Total BioEng	4	10	1	5	5	15	114.00	114.00	2,672.00	2,872.00	3,272.00	428.00		3,700.00	3,700.00	6,372.00	
Babbitt	1	5	1	1	2	7	331.00	331.00		331.00	236.11	346.59		582.70		913.70	
Korteme	1	4	1	0	1	5	133.00	133.00		133.00	621.46	270.66		892.12		1,025.12	
Sali	1	13	1	1	2	15	370.00	370.00		370.00	117.48	544.42		661.90		1,031.90	
Tang	1	5	0	0	0	5	373.00	373.00		373.00	280.92	309.82		590.74		963.74	
PSPG - Debbie		(53)	0	1	1	1											
Department						0											
Total BPS	4	27	3	3	6	33	1,207.00	1,207.00	0.00	1,207.00	1,255.97	1,492.74	0.00	2,748.71	2,748.71	3,965.71	
Total	8	37	4	8	11	48	766.00	3,113.00	0.00	3,879.00	4,527.97	1,920.74	0.00	6,448.71	6,448.71	10,327.71	
<b>DC</b>																	
Lee	1	1	0	1	1	2	0.00	1,780.00		1,780.00							
Total	1	1	0	1	1	2	0.00	1,780.00		1,780.00							
<b>Genentech</b>																	
BMI - Julia		(34)	0	1	1	1	188.00	188.00		188.00						188.00	
Biophysics - Rebecca		(61)	0	1	1	1	162.00	162.00		162.00	733.96	184.50	918.46	918.46		1,080.46	
Departmental			0	2	2	2	0.00	350.00	162.00	162.00	733.96	184.50	918.46	918.46		1,288.46	
Total	0	16	0	2	2	2	0.00	350.00	162.00	162.00	733.96	184.50	918.46	918.46		1,288.46	
<b>HSE</b>																	
Hurt	1	2	0	0	0	2	502.00	127.00	629.00	629.00						629.00	
Huang/DSU	1	7	8	0	8	15	1,003.50	1,003.50	1,003.50	1,003.50						1,003.50	
"Nadav	1	1	1	1	2	2	0.00	0.00	0.00	0.00						0.00	
Szoka	1	6	3	1	4	10	3,444.00	3,444.00	3,444.00	3,444.00						3,444.00	
(Benet)						0	292.50	292.50	292.50	292.50						292.50	
Department						0	2,533.00	383.00	2,916.00	2,916.00						2,916.00	
Total	4	16	11	2	13	29	7,775.00	510.00	8,285.00	8,285.00	0.00					8,285.00	
<b>HSW</b>																	
*Brodsky	1	9	1	0	1	10											
Total	1	9	1	0	1	10											
<b>Lawrence, So.SF</b>																	
DSU			8			8	7,420.00	7,420.00	7,420.00	7,420.00						7,420.00	
Total			8			8	7,420.00	7,420.00	7,420.00	7,420.00						7,420.00	

HumGen space

Hooper Frdn space

BTS SPACE ALLOCATION

Space	Academic HR		Staff HR		Pers. Total	Pers. %	100% Occupancy						Shared			Total Allocated & Shared ASF	Total 100% Allocated & Shared ASF	
	Faculty	Total Acad	Lab	Admin			Research	Other	Allocated by Chancellor	Loaned by Chancellor	Total 100% ASF Occupied	Research	Other	Allocated by Chancellor	Loaned by Chancellor			Total Shared ASF
<b>Faculty</b>																		
<b>Med Science</b>																		
Chen (Giacomini)	1	1	1	0	1	2				2,199.00		2,199.00						2,199.00
Hoener	1	1	0	0	0	1			215.00		215.00							215.00
SOS - Emry			1	1	1				65.00		65.00							65.00
MSO - Maria F.			1	1	1				83.00		83.00							83.00
Adm Mgr - Lisa			1	1	1				123.00		123.00							123.00
Analyst, Fin/Purch			3	3	3				1,180.00		1,180.00							1,180.00
Fin. Mgr			1	1	1													
Department			0	0	0				3,318.00		3,318.00				199.00		199.00	
<b>Total</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>7</b>	<b>8</b>	<b>10</b>			<b>4,488.00</b>	<b>2,695.00</b>	<b>7,183.00</b>				<b>199.00</b>		<b>199.00</b>	<b>7,382.00</b>
<b>Rock Hall</b>																		
Burchard	1	1	0	0	0	1			165.00		165.00							165.00
Giacomini	1	9	0	1	1	10			604.74	175.00	779.74							924.74
Guo	1	9	2	0	2	11			657.00	165.00	822.00							822.00
Kroetz	1	4	0	0	0	4			441.11	165.00	606.11							606.11
Loaned to Pleasure, Department						0			8.15		8.15							8.15
<b>Total</b>	<b>4</b>	<b>23</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>26</b>			<b>1,966.00</b>	<b>670.00</b>	<b>1,814.00</b>	<b>822.00</b>			<b>849.11</b>		<b>849.11</b>	<b>4,816.09</b>
<b>UC Hall</b>																		
Benet	1	3	1	1	2	5			1,552.00	453.00	2,005.00							2,005.00
Sambol	1	2	0	0	0	2			225.00	263.00	488.00							488.00
Verotta	1	1	2	1	3	4			409.00		409.00							409.00
WOS	(33)	(33)	0	0	0	(33)			150.00	150.00	150.00							150.00
<b>Department</b>									195.00	195.00	195.00							195.00
<b>Total</b>	<b>3</b>	<b>6</b>	<b>3</b>	<b>2</b>	<b>5</b>	<b>11</b>			<b>2,186.00</b>	<b>1,061.00</b>	<b>3,247.00</b>				<b>38.69</b>		<b>38.69</b>	<b>3,344.09</b>
<b>TBH</b>																		
FTE TBH	3	3				3												
HR Mgr			1	1	1													
Acad. HR and Fin.			1	1	1													
Prog & Proj. Mgr.			1	1	1													
RAP			1	1	1													
AA III			1	1	1													
<b>Total</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>8</b>												

<b>Total</b>	<b>26</b>	<b>97</b>	<b>30</b>	<b>28</b>	<b>58</b>	<b>154</b>	<b>100%</b>	<b>24,601.00</b>	<b>10,179.00</b>	<b>20,691.00</b>	<b>14,089.00</b>	<b>34,780.00</b>	<b>8,680.56</b>	<b>3,798.79</b>	<b>6,030.64</b>	<b>6,448.71</b>	<b>12,479.35</b>	<b>47,259.35</b>
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<b>Total BioEng</b>	<b>4</b>	<b>10</b>	<b>1</b>	<b>6</b>	<b>7</b>	<b>17</b>	<b>11%</b>	<b>766.00</b>	<b>1,906.00</b>	<b>0.00</b>	<b>2,672.00</b>	<b>2,672.00</b>	<b>3,272.00</b>	<b>428.00</b>	<b>0.00</b>	<b>3,700.00</b>	<b>3,700.00</b>	<b>13%</b>
<b>Total BPS</b>	<b>21</b>	<b>87</b>	<b>29</b>	<b>22</b>	<b>51</b>	<b>137</b>	<b>89%</b>	<b>23,835.00</b>	<b>8,273.00</b>	<b>20,691.00</b>	<b>11,417.00</b>	<b>32,108.00</b>	<b>5,408.56</b>	<b>3,370.79</b>	<b>6,030.64</b>	<b>2,748.71</b>	<b>8,779.35</b>	<b>87%</b>

NOTES:  
 \* Grad Students, not included in total academic count  
 \* Nadav = occupies HG space  
 \* Brodsky = occupies Hooper Foundation space

- BPS
- BioEng
- Future
- On loan by PharmChem