STAFF ANALYSIS
Proposed Doctor of Philosophy in Genetics and Genomics
University of Florida
(CIP #26.0801)

Estimated Costs:

	Total	% & $ Current	% & $ New	% & $ C&G	Cost per FTE	SUS 2004-2005 Average Costs
Year 1	$904,558	46 % $414,813	37% $334,760	17% $154,985	$103,972	$27,975 for CIP 26 Doctoral Level
Year 5	$2,120,169	48 % $1,014,131	34% $727,646	18% $378,392	$34,814	

Projected FTE and Headcount are:

	Projected Headcount	**Student FTE**
First Year	10	8.7
Second Year	20	17.4
Third Year	35	30.45
Fourth Year	55	47.85
Fifth Year	70	60.9

On April 30, 2003, the Florida Board of Governors approved eight criteria, divided into the two categories of Readiness and Accountability, by which implementation authorization of new doctorates were to be assessed. The following is an analysis of the University's proposal based on further delineations of those eight criteria.

Page Numbers:

READINESS					**ACCOUNTABILITY**		
Mission & Strength	**Program Quality**	**Curriculum**	**Faculty**	**Resources**	**Need**	**Budget**	**Productivity**
2	2-3	3-4	4-5	5-6	6-7	7	8

READINESS

1. Mission and Strength *- The goals of the program are aligned with the University's mission and relate to specific institutional strengths. The program is aligned with goals identified within the State University System Strategic Plan.*

Evidence that the proposed program is responsive to the goals of the current State University System Strategic Plan and the goals of the proposed program relate to the institutional mission statement as contained in the Strategic Plan

The implementation of a Ph.D. in Genetics and Genomics would be consistent with the 2005-2013 Strategic Plan's broad goal of building world-class academic programs and research capacity in the State University System, and the specific goal of creating access to and production of technology doctoral degrees in the field of biotechnology. The Ph.D. in Genetics and Genomics is not currently offered in the State University System.

Evidence of a relationship to specific institutional strengths

The proposed PhD in Genetics and Genomics is an interdisciplinary degree program which brings together the College of Agricultural and Life Sciences, the College of Liberal Arts Studies, and the College of Medicine, fostering the University of Florida's strategic goal of increasing interdisciplinary research. Program faculty will be affiliated with the University of Florida Genetics Institute, and individual departments, including Zoology, Microbiology, Horticultural Sciences, and Medicine. The Genetics Institute seeks an improved understanding of genes, with the ultimate goal of developing new therapies for human and veterinary diseases and improving crop yields.

2. Program Quality *– Planning activities have been sufficient and responses to any recommendations to program reviews or accreditation activities in the discipline pertinent to the proposed program have been addressed.*

Evidence that planning for the proposed program has been a collaborative process involving academic units and offices of planning and budgeting at the institutional level, as well as external consultants, representatives of the community, etc.

According to the proposal, planning for the program began in the fall of 2003, when a curriculum/planning committee was commissioned to design a graduate genetics program. The committee was composed of faculty from the fields of microbiology, medicine, zoology, statistics, conservation, and horticulture. The program was fully developed during the fall of 2004, and presented to the faculty of the Genetics Institute for feedback. The committee then presented the program to administrators, including the interim dean for the graduate school, and department chairs from across the campus. After clearing these reviews, the program was considered ready to move forward to the University Board of Trustees.

Evidence of an appropriate timetable of events leading to the implementation of the proposed program.
The timetable provided for implementation anticipates accepting the first students in the fall of 2007. The Department states that they have received numerous inquiries from students interested in the program, the graduate coordinator has been appointed, and the faculty has come together to develop new courses.

Evidence that progress has been made in implementing the recommendations from program reviews or accreditation activities in the discipline pertinent to the proposed program
The proposal states that the University of Florida Genetics Institute underwent an external review in February 2007. The proposed Ph.D. in Genetics and Genomics was discussed during this review, and reviewers favored implementation of the program. The proposal also states that the College of Medicine was recently reviewed by the Liaison Committee on Medical Education (LCME). No concerns were raised regarding academic standards.

3. Curriculum *- The proposal describes an appropriate and sequenced course of study, admissions and graduation criteria are clearly specified and appropriate, and the appropriateness of specialized accreditation is addressed.*

Evidence of an appropriate, sequenced, and fully described course of study; evidence of specific learning outcomes and industry driven competencies are discussed for any science and technology programs
To be admitted into the Ph.D in Genetics and Genomics program, a student must have a baccalaureate in life sciences or a computationally intensive field from a regionally accredited college or university, or an international equivalent, with a minimum grade point average of 3.0 for all upper division coursework, and a GRE score of 1000 (and a minimum score of 550 on the TOEFL if applicable). The program will require a minimum of 90 credit hours beyond the baccalaureate.

The core curriculum is intended to expose students to all areas of genetics and to enhance computational skills. The proposal states that dissertation projects will be available to students in all areas of genetics. Program tracks include plant molecular genetics (with optional emphasis on breeding), mammalian/human genetics, population genetics and molecular evolution, statistical genetics, and bioinformatics. The program is compared to genetics programs at Harvard, North Carolina State, and Stanford in the proposal. When reviewing program Web sites, one observes that the North Carolina State program appears to be comparable, offering exposure to the same range of genetics fields. However, Harvard does not offer a Ph.D. in Genetics (there is a genetics focus in several Ph.D. programs), and Stanford appears to place a stronger emphasis on laboratory research and biological sciences.

The proposal states that the program will expose students to different laboratory philosophies, technologies, and projects, with the intent of preparing them for employment in the biotechnology industry, the pharmaceutical industry, government agencies, non-governmental organizations, and academic positions.

Evidence that, if appropriate, the bachelor's and master's degree programs associated with the program are accredited and that the institution anticipates seeking accreditation for the proposed program if available

The proposal states that there is no accreditation body for Ph.D. programs in genetics. Bachelor's and master's degree programs in genetics are not offered at UF. The American Board of Medical Genetics (ABMG) accredits human genetics training programs. Participation in an ABMG-accredited residency is recommended for future Clinical and Medical Geneticists.

Evidence that the institution has analyzed the feasibility of providing all or a portion of the proposed program through distance learning technologies via its own technological capabilities

At present, this program will be offered to on-campus full-time students in a traditional format. In the future, as need arises, the Graduate Council may be asked to consider proposals to confer this degree jointly with other institutions, including collaborators such as Scripps or international universities.

4. Faculty *– A critical mass of faculty will be available to initiate the program based on estimated enrollments, and faculty in the aggregate has the necessary experience and research activity to sustain a doctoral program.*

Evidence that there is a critical mass of faculty available to initiate the program based on estimated enrollments

The proposal states that eighty-nine faculty members will be involved with the implementation of this new degree program. All of these faculty members will be eligible to serve on a student's supervisory committee. No new faculty members are needed to implement the program. Faculty members will spend, on average, four hours per week with each doctoral student under their supervision, an effort of 10%. Ten Ph.D. students are projected to enroll during the first year. By Year Five of the new program, fifty Ph.D. students are projected to enroll.

Evidence that the faculty in aggregate have the necessary experience and research activity to sustain the program

With eighty-nine faculty members on staff, a wide range of experience and expertise will be available within this program. The majority of participating faculty are tenured or tenure seeking. Faculty biosketches are included as an appendix to the proposal.

Evidence that, if appropriate, there is a commitment to hire additional faculty in later years, based on estimated enrollments
The proposal shows the intent to provide good coverage of teaching, advising, and scholarly activity as enrollment increases. A plan is in place to gradually shift the workload of affiliated faculty from their home department to the genetics program over time, as dictated by enrollment and advising needs. There is an anticipated workload increase from 7 faculty-person years in Year One to 11.45 faculty-person years in Year Five.

In the event of a shortage of available faculty, laboratory facilities, library holdings, courses, or financial support, the admissions committee plans to manage the number of students admitted to match resources available.

*5. **Resources** – The necessary library volumes and serials; classroom, teaching laboratory, research laboratory, office space, equipment, clinical and internship sites, fellowships, scholarships, and graduate assistantships will be sufficient to initiate the program.*

Evidence that library volumes and serials are sufficient to initiate the program
An assessment of library collection readiness is included as an appendix to this proposal. The library appears to have a large collection of journals, serials, and volumes, and two librarians dedicated to helping researchers in genetics.

Evidence that classroom, teaching laboratory, research laboratory, office, and any other type of space that is necessary for the proposed program is sufficient to initiate the program
The proposal states that the University of Florida Cancer Genetics Research Complex (CGRC) will serve as a hub for the proposed Ph.D. in Genetics. Facilities available to the genetics and genomics program include classrooms, instructional laboratories, research laboratories, faculty offices, and support space distributed across the campus, as few participating faculty members are housed in the CGRC.

Evidence that necessary and sufficient equipment to initiate the program is available
The research laboratories of the Genetics and Genomics faculty are described in the proposal as "state-of-the-art," housing major research equipment to support DNA sequencing, gene expression analysis, genotyping, and gene mapping. No new equipment will be requested.

Evidence that, if appropriate, fellowships, scholarships, and graduate assistantships are sufficient to initiate the program
The proposal states that 95% or more of the doctoral students who work in the broad discipline of genetics are currently funded through research grants, fellowships, or teaching assistantships.

Evidence that, if appropriate, clinical and internship sites have been arranged
The University did not comment on internship availability.

ACCOUNTABILITY

6. Need *- There is a need for more people to be educated in this program at this level and if the program duplicates other professional and doctorate degrees in Florida, a convincing rationale for doing so is provided.*

Evidence that there is a need for more people to be educated in this program at this level
The proposal states that Enterprise Florida has identified life sciences as one of the key sectors in Florida's growing economy. In 2003, the Scripps Research Institute received some $500 million in incentives, including state and federal funds, to build a new facility in Palm Beach County. Recently, the Burnham Institute for Medical Research received $310 million worth of state and local incentives to construct a new Orlando campus. The Torrey Pines Institute for Molecular Studies plans to open a facility in Port St. Lucie in return for $80 million worth of state and local incentives. According to the May 9, 2007 edition of the *Palm Beach Post*, Torrey Pines is currently only weeks away from opening temporary laboratories.

During the 2007 Legislative Session, $5 million was allocated to UF for research enhancement, and $100 million to the SUS to boost the state's science-focused Centers of Excellence, the goal of which is to enable economic development in the State of Florida.

According to the 2006-07 Bureau of Labor Statistics *Occupational Outlook Handbook*, there are more than 20,000 additional job openings for doctoral-level medical scientists for the period of 2004-14. Growth in this field is considered "much faster than average."

Evidence that the proposed program does not duplicate other SUS or independent college offerings or, otherwise, provides an adequate rationale for doing so
The proposed program is not offered anywhere else in the SUS or Florida independent institutions.

Evidence of reasonable estimates of student headcount and FTE who will major in the proposed program, and commitment to a diverse student body
The FTE estimates appear high, averaging 0.87 FTE/graduate student. The program anticipates that all enrolled students will be funded on either an assistantship or a fellowhip. Compliance with the rules of University assistantships and fellowships has led to this high ratio. Assistantships require students to register for 9 credit hours per semester during the academic year, and 6 credit hours during the summer, for a total of 24 hours per year. Fellowships require students to enroll in 12 credit hours per semester during the academic year, and 8 credit hours during the summer, for a total of 32 hours per year.

Headcount for UF's Genetics and Genomics doctoral program appears to be relatively high, growing from 10 students in Year One to 70 in Year Five, reaching 100 doctoral students in residence at maturity. Recent interdisciplinary doctoral programs approved in the field of biological science, including UF's Ph.D. in Animal Molecular and Cellular Biology and FSU's Ph.D. in Biostatistics, estimate 18-20 doctoral students in Year Five. These estimates are consistent with long-standing specialized doctoral degrees in the life sciences, including FSU's Molecular Biophysics and USF's Cancer Biology. This high headcount can be accounted for by six distinct program track offerings, and an estimate of 10 entering students per year and 5 years to completion of the doctoral degree.

The proposal states that the Genetics and Genomics program will work with the Office of Graduate Minority Programs (OGMP) to develop strategies to recruit and retain students who are typically underrepresented in graduate programs. No supporting evidence is provided that current policies have historically been effective, but the proposal is signed by the University's equal opportunity officer, Mr. Larry Ellis.

7. Budget - *A complete and realistic budget for the program is provide, and any redirection of funding will not have an unjustified negative impact on other needed programs.*

Evidence of a budget for the program that is complete and reasonable, and comparable to the budgets of similar programs at other SUS institutions, and reflective of the proposal's text

Faculty salaries in Table Four were derived as an estimate of the amount of time that faculty members would devote to the new Ph.D. in Genetics. Non-personnel expenses are also included in the program budget. Indirect cost returns from the University of Florida Genetics Institute's budget have also been committed to the program as a means of attracting talented students through assistantships and fellowships.

Evidence that, in the event that resources within the institution are redirected to support the new program, such a redirection will not have a negative impact on undergraduate education.

Resources will be shifted from the University of Florida Genetics Institute to the Genetics and Genomics PhD program to fund the tuition and stipends of students admitted to the Genetics and Genomics program, and to offer competitive research and travel awards. In return, the Genetics Institute will receive student researchers. The proposal does not specify if students will utilize resources from other departments by enrolling in their doctoral level courses.

8. Productivity *- The academic unit(s) associated with this new degree have been productive in teaching, research, and service.*

Evidence that the academic unit(s) associated with this new degree have been productive in teaching, research, and service.

According to the proposal, the existing Department of Molecular Genetics and Microbiology, located in the College of Medicine, has been ranked 13th in the nation in grants and contracts from the National Institutes of Health, receiving $8,583,350 in NIH genetics research grants during the 2005 fiscal year. Faculty biosketches attached to the proposal are intended to highlight productivity of individual faculty members.