University Council

March 10, 2023

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Dear Colleagues:

The attached proposal from the College of Agricultural and Environmental Sciences to offer a new major in Regenerative Bioscience (Ph.D.) will be an agenda item for the March 17, 2023, Full University Curriculum Committee meeting.

Sincerely,

Susan Sanchez, Chair
cc: Provost S. Jack Hu
Dr. Marisa Pagnattaro

UNIVERSITY SYSTEM OF GEORGIA

USG Academic Degree Program Application

Released

December 21, 2020

Version Control

Date	*Changes*	*USG Approved date*	*Website update date*
12-18-2020	*Revised question 34 and 61 for clarity; Revised question 47 to include part b with the tuition comparison table for peer or competitive programs; reworded question 49 to include costs and benefits per fee; Revised question 50 related to additional costs to students; Revised question 51 to clarify the question related to indirect costs.*		

NOTE:

Italicization indicates a question or field on the in-take form

^= indicates accreditation related content

USG Routing

- *Program was part of the Annual Academic Forecast*
- *This proposal can be expedited (Nexus, established concentration with strong enrollment)*
- *This proposal requires USG integrated review*

USG ACADEMIC PROGRAM APPLICATION

A. OVERVIEW

To be completed as part of SharePoint Submission

1. *Request ID: (SharePoint Generated unique ID)*

2. *Institution Name: University of Georgia*

3. *USG Sector: Research University*

4. *School/Division/College: College of Agricultural and Environmental Sciences*

5. *Academic Department: Animal and Dairy Science*

6. *Proposed Program Name: Doctor of Philosophy with a major in Regenerative Bioscience*

7. *Major: Regenerative Bioscience*

8. *CIP Code (6 digit): 26.0102 (26010200)*

9. *Degree Level: Doctoral*

10. *Anticipated Implementation Semester and Year^: Fall 2023*

11. *Was this program listed in the most recent Academic Forecast?*

    ☒ *Yes*

    ☐ *No (If no, explain why below)*

12. *Program Description (Provide a description of the program to be used in the Board of Regents meeting packet):*

    The Department of Animal and Dairy Science (ADS) and Regenerative Bioscience Center (RBC) faculty are proposing to offer a Ph.D. in Regenerative Bioscience (RB) in order to meet the emerging need for highly trained personnel in this field in both academia and industry. Regenerative bioscience research has had a direct impact on healthcare and medicine by contributing to the development of novel cellular therapies, artificial organs, biomaterials, diagnostic technologies, and medical devices that can accelerate tissue repair, provide prosthetic support, and enable rapid and accurate monitoring of injury and disease progression. Georgia is home to a sizeable biomedical technology and services industry, with around 443 companies located in the Atlanta metro area alone. Only two Georgia academic institutions currently

offer advanced degrees in areas related to regenerative bioscience. Both Emory University and the Georgia Institute of Technology offer Ph.D.'s in Stem Cell Research and Biomedical Engineering, which focus on tissue engineering and regenerative medicine, respectively. The Department of Neuroscience and Regenerative Medicine at Augusta University offers a Ph.D. program in Neuroscience. However, there are no formalized Ph.D. programs in the state focused on providing interdisciplinary research and entrepreneurial training in Regenerative Bioscience in the state of Georgia. The proposed RB Ph.D. program will focus on training individuals who can help meet the burgeoning regenerative bioscience research and industry needs both nationally and in the state of Georgia. Students from the Regenerative Bioscience undergraduate major can choose enter the RB Ph.D. upon successful completion of the undergraduate major requirements. The RB Ph.D. will complement curriculum and training provided by the RB undergraduate major, and provide advanced interdisciplinary training opportunities for students in biomanufacturing of cellular therapies and tissues, biomaterials for tissue engineering, gene therapy, biomedical imaging, and biomedical computation. In addition to providing fundamental training in these areas, the major also aims to prepare students for non-academic careers by providing with ample opportunities for entrepreneurship and technology commercialization training in partnership with the UGA Innovation Gateway.

13. Accreditation^: Describe disciplinary accreditation requirements associated with the program (if applicable, otherwise indicate not applicable).

    Not Applicable

14. Specify **SACSCOC** or other accreditation organization requirements^.
    Mark all that apply.

    ☐ Substantive change requiring notification only [1]

    ☐ Substantive change requiring approval prior to implementation [2]

    ☐ Level Change [3]

    ☒ None

B. STRATEGIC PLAN

15. How does the program align with your institutional mission and function^?
    If the program does not align, provide a compelling rationale for the institution to offer the program.

    The development of a Regenerative Bioscience (Ph.D.) fits well with both the mission of the ADS department and with UGA's institutional mission. A major mission of the ADS department is "*to recruit students and provide scholarships for a critical mass of high quality and diverse individuals, to educate and release into the job market for technical and professional positions in the food animal production, veterinary, biomedical, and biotechnological fields*." The primary goals of the RB doctoral program are to inspire and educate the next generation of highly qualified regenerative bioscience innovators and to support their transition to rewarding careers in biomedical research and technology that span both animal and human health. This program aims to recruit a diverse group of prospective doctoral students. The RB Ph.D. program is ably supported by an exceptional group of graduate faculty who lead federally funded biomedical research and education programs. Therefore, the program strongly aligns with UGA's institutional mission and will directly contribute to UGA's "*commitment to excellence in a teaching/learning environment dedicated to serve a diverse and well-prepared student body, to promote high levels of student achievement, and to provide appropriate academic support services.*"

[1] See page 22 (Requiring Notification Only) of SACSCOC Substantive Change Policy and Procedures document.
[2] See page 17 (Requiring Approval Prior to Implementation) of SACSCOC Substantive Change Policy and Procedures document.
[3] See page 3 (Level Change Application) of SACSCOC Seeking Accreditation at a Higher or Lower Degree Level document for level change requirements.

16. How does the program align with your institution's strategic plan and academic program portfolio? Identify the number of existing and new courses to be included in the program.

Regenerative Bioscience (Ph.D.) aligns well with all three strategic directions of the University of Georgia 2025 Strategic Plan which calls for:

I. *Promoting excellence in teaching and learning*. The RB Ph.D. program is foundationally based on the collaborative research and training infrastructure that was developed over the past 17 years in the Regenerative Bioscience Center. Faculty in the RBC have developed strong federal and privately funded research programs, which have provided training opportunities for a number of graduate and undergraduate scholars who are currently pursuing research and professional careers in biomedical sciences. Graduate courses are taught by RB faculty experts in stem cell biology, nervous system injury, neurodegenerative disease, cancer biology, musculoskeletal diseases, and other areas related to regenerative bioscience. Doctoral students who are directly mentored by ADS/RB faculty are supported by generous stipends from federal agencies, private foundations, and institutional resources, which provides students dedicated time and resources for learning and to perform cutting-edge research in these disciplines. The RBC conducts the RBC Collective program every semester which provides opportunities for graduate students to develop skills in presentation and discussion of regenerative research related topics in an academic multidisciplinary forum. Graduate students are also actively involved in research mentorship of undergraduate research trainees who are recruited into the laboratories of RB faculty through the RBC Fellows Program and other undergraduate outreach activities through the UGA Undergraduate Neuroscience Organization. RBC graduate and undergraduate students routinely attend national and international scientific meetings

II. *Growing research, innovation, and entrepreneurship*. Research in the RBC is focused on bridging therapeutic gaps for neurodegenerative diseases, stroke, traumatic brain injury, cancer, musculoskeletal dysfunction, and other disorders. RBC faculty are leaders in these fields, having published high-impact research that has gained national and international attention. Research innovations have also led to the formation of startup companies that are working with the UGA Innovation Gateway (https://research.uga.edu/gateway/) to facilitate the licensing and commercialization of these technologies. RBC graduate students are integral to the success of these efforts. Several RBC graduate students regularly participate in the UGA National Science Foundation (NSF) iCorps cohorts every semester where they learn to develop value propositions, market value projections, and conduct customer discovery interviews. These experiences complement laboratory and classroom education are an essential part of their training and development.

III. *Strengthening Partnerships with Communities across Georgia and around the World.* Since its inception in 2004, faculty members in the RBC have not only made major scientific discoveries but have also forged partnerships with scientific communities in Georgia and across the world. These achievements include 1) serving as a National Institute of Health funded training center to provide scientific training in embryology, developmental biology, tissue engineering, and cell biology; 2) working with the Environmental Protection Agency (EPA) to predict the adverse effects of endocrine active compounds in children; 3) partnering with the National Institute for Innovation of Manufacturing Biopharmaceuticals (NIIMBL) to develop a skilled biotechnology workforce and to boost production of cellular therapies; 4) working with regional, national, and international partners through the National Science Foundation funded Center for Cell Manufacturing Technologies (CMaT) to transform the manufacturing of cell-based therapies.

C. NEED

17. *Was this proposal and the design of the curriculum informed by talking with alumni, employers, and community representatives?*

☐ *No*

☒ *Yes (If yes, use the space below to explain how their input informed this proposal)*

This proposal and design were developed in consultation with alumni, employers, and community representatives. With respect to industry partners, faculty discussed their hiring needs and the type of training future employees would require to be successful. The curriculum complements coursework included

in the regenerative bioscience undergraduate major and provides advanced training in stem cell biology and regenerative bioscience. This information was integrated into the curriculum during the major development process. Faculty have since shared the new Regenerative Bioscience (Ph D.) application with key stakeholders, including alumni and community representatives. Please see their letters of support in Appendix IV.

18. *Does the program align with any local, regional, or state workforce strategies or plans?*

☐ *No*

☒ *Yes (If yes, please explain below)*

The program responds to the mandate of the National Board for Professional Teaching Standard's call for the creation of a skilled technical workforce that is driven by science and engineering (2019 report, "The Skilled Technical Workforce: Crafting America's Science and Engineering Enterprise."). The program also addresses statewide education and workforce development needs via frequent interactions with Georgia manufacturing innovation institutes such as the National Science Foundation, the Engineering Research Center for Cell Manufacturing Technologies, the National Institute for Innovation in Manufacturing Biopharmaceuticals, and the Marcus Center for Therapeutic Cell Characterization and Manufacturing, as well as research and education partnerships with Georgia Institute of Technology, Emory University, and Augusta University. The program will also provide workforce development of Athens area technical college personnel and address employer needs of regional and statewide regenerative medicine and biopharmaceutical industries.

19. Provide any additional evidence of regional demand for the program^ (e.g. prospective student interest survey data, community needs, letters of support from employers)

The RBC has made a significant impact on UGA student community through various activities. Examples of these include the RBC Fellows program, which trains more than 65 undergraduate students annually from various departments across the university. The RBC-led research collective attracts undergraduate and graduate level participants from diverse departments across UGA, who are introduced to RBC faculty-led research and the field of regenerative bioscience. Several undergraduate students from biology, engineering, genetics, biochemistry, chemistry, and veterinary medicine who participate in laboratory research in RBC faculty laboratories have expressed interest in conducting graduate research in regenerative bioscience. A survey of 2,227 Animal and Dairy Science alumni indicated that 31% of recent graduates (2000 to 2019) went into health-related fields and 10% went into research-related fields, which is a sizable population of students that can be recruited into the RB Ph.D. program. More than 50% of participants indicated that more emphasis should be placed on biotechnology, a key area of the Regenerative Bioscience major.

20. *Identify the partners you are working with to create a career pipeline with this program[4].^*

Mark all that apply

☐ High School CTAE	☒ Other USG institutions	☒ Professional associations
☒ High School STEM	☐ Other universities	☒ Other (specify below)
☐ Career academies	☒ Employers	Letters of Support
☒ TCSG programs	☒ Community partnerships	☐ None

[4] Provide letters of support and explain the collaboration and how partners will share or contribute resources. (Consider internal pipeline programs – "off-ramp program" Nursing to integrated health or MOUs for pathways with other USG institutions (pipelines – keep them in state for grad school if we can)

UGA Regenerative Bioscience faculty are deeply involved with the research and education activities of Georgia manufacturing innovation institutes such as the National Science Foundation, the Engineering Research Center for Cell Manufacturing Technologies, the National Institute for Innovation in Manufacturing Biopharmaceuticals, and the Marcus Center for Therapeutic Cell Characterization and Manufacturing. UGA regenerative bioscience faculty support and student participation is critical to success of these efforts.

The RBC has longstanding research and education involvement with the UGA Young Dawgs program, which recruits high school students to conduct research in RBC faculty laboratories. As stated above, the center is closely involved in research and education partnerships with Georgia Institute of Technology, Emory University, and Augusta University. These partnerships have led to the establishment of federally funded centers for manufacturing innovation, which involves collaborations with other USG institutions such as Georgia Institute of Technology. The RBC is developing industry research partnerships and community education partnerships with Athens Technical College. The RBC organizes annual retreats in collaboration with other USG institutions and RBC faculty are leaders in several regenerative medicine-focused professional associations such as the Regenerative Engineering and Medicine (REM) Center (https://regenerativeengineeringandmedicine.com/), Tissue Engineering and Regenerative Medicine International Society (https://termis.org/), and the Society for Biomaterials (https://biomaterials.org/).

21. Are there any competing programs at your own institution?

☒ *No*

☐ *Yes (If yes, provide additional information about the competing program(s) below).*

22. The program service area is used as the basis for labor market supply and demand analysis. What is the program's service area (local, regional, state, national)? If outside of the institution's traditional service area, provide a compelling rationale for the institution to offer the program. If the program's service area is a region within the state, include a map showing the counties in the defined region.

The program service area is state and national.

23. Do any other higher education institutions in close proximity offer a similar program?

☒ *No*

☐ *Yes (If yes, provide a rationale for the institution to offer the program)*

Both Emory University and the Georgia Institute of Technology offer Ph.D. programs in Stem Cell Research and Biomedical Engineering, which focus on tissue engineering and regenerative medicine, respectively. The Department of Neuroscience and Regenerative Medicine at Augusta University offers a Ph.D. program in Neuroscience. However, there are no formalized Ph.D. programs that are focused on providing interdisciplinary research and entrepreneurial training in Regenerative Bioscience in the state of Georgia.

24. Based on the program's study area, what is the employment outlook for occupations related to the program, according to the CIP to SOC crosswalk in the Qlik **IPEDS Application^**. An Excel version of the CIP to SOC crosswalk is also available from NCES. If data for the study area is not available, then use state- or national-level data.

    a. Click **here** for US and Georgia occupation projections
    b. Click **here** for 2026 Georgia Department of Labor data projections for the State or Georgia Workforce Board Regions in Qlik (link to GDOL Projections); data is also available through the GDOL Labor Market Explore Website
    c. For a custom Georgia geography – request a Jobs EQ report from **USG Academic Affairs office.**

Related Occupation	SOC code	Current Employment [Enter Year]	Projected Employment [Enter Year]	# Change	% Change	Average Annual Openings
Biological Science Teachers, Postsecondary	25-1042	720	960	240	33.3	90
Biological Scientists, All Other	19-1029	1,070	1,170	100	9.3	110
Biomedical Engineers	17-2031	220	230	10	4.5	20
Epidemiologists	19-1041	420	450	30	7.1	40
Genetic Counselors	29-9092	2,600	3,200	600	22	200
Medical Scientists, Except Epidemiologists	19-1042	1,570	1,860	290	18.5	180

The top three occupations that graduates from this program will fill are Medical and Biological Scientists, Biological science teachers (postsecondary), and Biomedical Engineers.

25. Using IPEDS data, list the supply of graduates in the program and related programs in the service area.^

Similar or Related Programs	CIP Code	Supply[1]	Competitor Institutions[2]
N/A (No similar or related programs)			

[1] Supply = Number of program graduates last year within the study area

[2] Competitors = List other institutions that offer this program or a similar program in the area (see **Question 23**)

26. Based on the data provided in questions **24** and **25**, discuss how this program will help address a need or gap in the labor market?^

The RB Ph.D. program will address acute shortages of an advanced-level workforce that can enhance industry/academia partnerships in the state of Georgia and beyond, and with the required academic training in regenerative bioscience, cell and gene therapy, cell manufacturing and supply chain, and tissue engineering.

27. Using data from ***O*-Net,*** identify the average salary for the related occupations identified in question 24. Then list at least three technical skills and three Knowledge, Skills and Abilities (KSAs) associated with the related occupations. This information can be found using at onetonline.org. (Standard Occupation Code = SOC)

	SOC Code (6 digit)	Average Salary (O-Net data)	Occupation specific technology skills & KSAs
Biological Science Teachers, Postsecondary	25-1042	**$85,600**	**Technology Skills**: Analytical or scientific software, Computer based training software, Word Processing Software

			Knowledge: Biology, Chemistry, Mathematics **Skills:** Speaking, Instructing, Active Learning **Abilities**: Oral Expression, Written Comprehension, Written Expression
Biological Scientists, All Other	19-1029	**$85,290**	**No Data**
Biomedical Engineers	17-2031	**$92,620**	**Technology Skills**: Analytical or scientific software, Computer aided design (CAD) software, Medical Software **Knowledge**: Biology, Computers and Electronics, Mathematics **Skills:** Critical Thinking, Reading Comprehension, Active Listening **Abilities**: Inductive Reasoning, Oral Comprehension, Oral Expression
Epidemiologists	19-1041	**$74,560**	**Technology Skills**: Analytical or scientific software, Spreadsheet software, Presentation Software **Knowledge**: English Language, Medicine and Dentistry, Biology **Skills:** Reading Comprehension, Critical Thinking, Science **Abilities**: Oral comprehension, written comprehension, Inductive Reasoning
Genetic Counselors	29-9092	**$85,700**	**Technology Skills**: Analytical or scientific software, Spreadsheet software, Medical Software **Knowledge**: Biology, Medicine and Dentistry, Therapy and Counseling **Skills:** Reading Comprehension, Critical Thinking, Active Listening **Abilities**: Oral comprehension, Oral expression, Written comprehension
Medical Scientists, Except Epidemiologists	19-1042	**$91,510**	**Technology Skills**: Analytical or scientific software, Data base user interface and query software, Presentation software

			Knowledge: Biology, Medicine and Dentistry, Chemistry **Skills:** Critical thinking, Science, Reading Comprehension **Abilities**: Oral comprehension, Written comprehension, Inductive/Deductive Reasoning

Notes:

28. *Using **GOSA Earning and Learnings data**, what is the typical salary range 5 years after graduation from the program?*

Average Salary	75th Percentile	50th Percentile	25th Percentile
1 year after graduation	62,369	46,950	40,491
5 years after graduation	89,606	64,286	50,906

Provide any additional comments, if needed:

"Ph.D. Degree in Biological And Biomedical Sciences" was used as the basis for the above salary ranges.

29. *Based on the data compiled and analyzed for this section (see Section C: Need), what is the job outlook for occupations filled by students with this degree?^*

Georgia has a growing need for highly trained professionals in the area of regenerative biosciences with the more than 570 bioscience facilities [1] and 400 hospitals [3] in the state. The Georgia bioscience industry currently employs nearly 24,000 professionals in biotechnology, testing laboratories, medical devices and diagnostics, pharmaceuticals, and many other related sectors (**Figure 1**). Top employers in the state of Georgia include major government agencies such as the U.S. Centers for Disease Control and Prevention (>8,500 employees), human and animal health companies such as Baxter International (>1,5000 employees) and Boehringer Ingelheim (>1,700 employees), and diagnostic laboratories such as Quest Diagnostics (>1,000 employees). Georgia is primed to grow over the next 7 years in the bioscience area with major growth projected in professions such as medical scientists (18.5% increase in jobs) and biological scientists (9.3% increase in jobs); **see table in Question 24**). With Georgia colleges and universities receiving 7,232 grants and $3.1 billion in National Institutes of Health (NIH) funding, the need for regenerative bioscience professionals to work in college and university based research continues to grow [3].

Georgia is also home to hundreds of state of the art public, private, and military hospitals, treatment facilities, and rehabilitation centers, many of which are world renowned centers of excellence [3].

The global regenerative medicine job market is projected at $57 billion by 2027 [4], which is driven primarily by emerging challenges in chronic diseases, genetic disorders, cancer, and tissue and musculoskeletal deficits. North America is deemed the largest regenerative medicine market in the world. Among these areas, the cell-based immunotherapy and cell therapy markets accounted for the largest market share of approximately $7.9 billion in 2020 [5]. According to the US. Bureau of Labor statistics, the job outlook for Ph.D. level "Medical Scientists" is anticipated to experience an increase of 17% between 2020-2030, which is much faster than average across all occupations [6]. The median pay for medical scientists was $91,510 in May 2020.

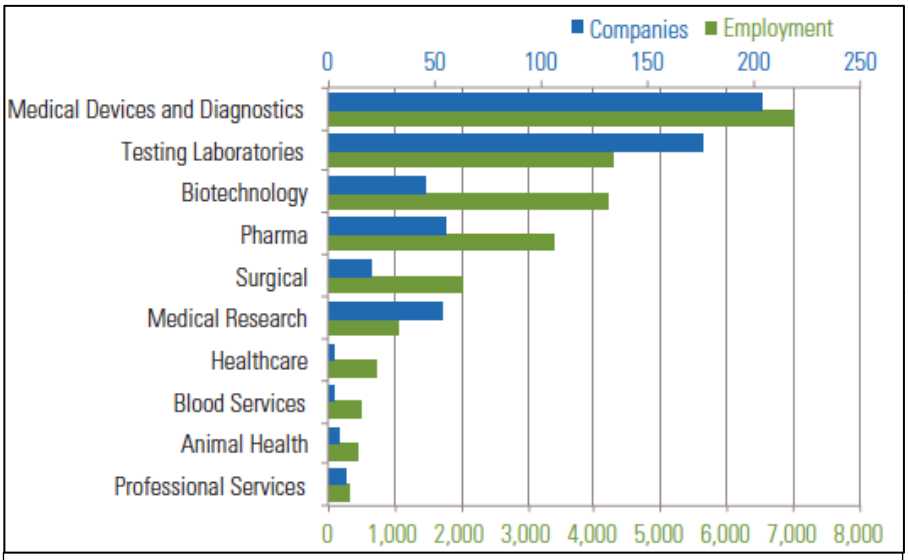

Figure 1. Employment by Sector for Georgia's Bio Industry. [1]

References:

1. Power, G., *Bioscience Industry*. 2016. p. 21.
2. Bureau, U.S.C. *The U.S. Joins Other Countries With Large Aging Populations*. 2018 October 8th, 2019 [cited 2020 August, 6th 2020]; Available from: https://www.census.gov/library/stories/2018/03/graying-america.html.
3. Power, G. *Georgia: Center of the Southeastern Healthcare Ecosystem*. 2016 [cited 2020 August 6, 2020]; Available from: https://www.selectgeorgia.com/resources/publications/healthcare-industry/.
4. Regenerative Medicine Market
5. Cell therapy market share
6. Bureau of labor statistics

D. CURRICULUM

30. Enter the number of credit hours required to graduate^
Enter # 30 – Minimum number of credits required

31. *Are you requesting a credit hour requirement waiver (either below or above traditional credit hour length requirements as prescribed by the University System of Georgia? See section 2.3.5 (Degree Requirements) of the USG Board of Regents Policy Manual* ***here*** *for more information).*
☒ *No*

☐ *Yes (*If yes, explain the rationale for the request in the space below*)*

32. Related to SACSCOC accreditation, specify if the program format of the proposed program is a^:

Format (Check 1)		50% or more of the program is delivered online
☐	Combination of on-campus and online	☐ Yes
☐	Combination of off-campus and online	☐ Yes
☐	Hybrid, combination delivery	☐ Yes

33. *Is the program synchronous or asynchronous?*[5] *Mark one of the options below.*

☐ *Synchronous*

The majority of courses are offered at scheduled, pre-determined times with students connecting to a virtual room or location and interacting with faculty and fellow students via web/video conferencing platform.

☐ *Asynchronous*

34. For associate's, Nexus, and bachelor's degree proposals, which **High Impact Practices**[6] (HIPs) will faculty embed into the program? Mark all that apply.

☒ First-Year Experiences

☒ Common Intellectual Experiences

☒ Learning Communities

☐ Writing-Intensive Courses

☒ Collaborative Assignments and Projects

☒Undergraduate Research

☐ Diversity/Global Learning

☐ ePortfolios

☐ Service Learning, Community Based Learning

☒ Internships

☐ Capstone Courses and Projects

[5] See SACSCOC Handbook for Institutions Seeking Initial Accreditation **here**.

[6] See Kuh (2008). High-Impact Practices: What They Are, Who Has Access to Them, and Why They Matter. *Association of American Colleges and Universities, 14*(3), 28-29).

35. Discuss how HIPs will be embedded into the program? Your discussion should provide specific examples and include whether the HIP is required or an optional component. It should also indicate at what point the experience is offered or required.

    (i.e. “Students will be required to participate in an externship during their third year of enrollment, in order to develop skills in… etc.”).

    HIPs will be embedded into the graduate program through mechanisms that are already in place. First is the RBC collective seminar (ADSC 8888), which is a required component. The course encourages data sharing and interdisciplinary learning in students from diverse research backgrounds communities. The seminar will feature talks on faculty experiences, data analysis, scientific writing, information literacy, and collaborative learning. The course is offered to all graduate students at any stage of training. From past experience, these efforts have led to the formation of learning communities with professors and trainees coming together as a group to work on collaborative research projects and research manuscripts. Second, graduate student participation in providing experiential learning opportunities for high schoolers and undergraduate researchers. This is an optional component, with graduate students in all stages of training participating in the recruitment and mentoring of undergraduate and high school trainees. UGA undergraduates are recruited through the RBC undergraduate research fellows program, and National Science Foundation (NSF) supported Research Experiences for Undergraduates (REU) summer programs. High schoolers are recruited through the UGA Young Dawgs program. Graduate students will mentor trainees on specific research projects that are are supported by the individual research labs and expose them to scientific inquiry, empirical observation, and cutting-edge technologies and research tools. Students will be encouraged to present their findings at the annual RBC fellows and center for undergraduate research (CURO) symposia, the national conference on undergraduate research (NCUR), and annual professional society meetings. Lastly, graduate students in the third year and beyond will be encouraged to seek internships to gain direct work experience in a professional setting that is related to their career interests.

36. *Does the program take advantage of any USG initiatives?*

    Mark all that apply, and provide a letter of support from applicable initiatives’ leadership.

    [ ] eCampus *[ ] Georgia Film Academy*

    [ ] FinTECH *[ ] Other: Specifiy Initiative Here*

37. ^For associate’s, Nexus, and bachelor’s degree proposals, list the specific occupational technical skills, and KSAs identified in question 27 and show how they related to the program learning outcomes. Insert more rows as needed.
    Complete this chart for the upper division or major curriculum only.

[1] Direct measures may include assessments, HIPs, exams, etc.

Alignment of Occupational KSAs [1]		Direct Measure (s)	Data Source
Analytical or scientific software		Written assessments and oral presentations	Direct observations of student products
Critical thinking, Science, Reading Comprehension		First and co-authored peer-reviewed manuscripts.	Evalauation of student products
Oral comprehension, Oral expression, Written comprehension		Qualifying and oral defense exams.	Evaluation of exams and oral defenses
Speaking, Instructing, Active Learning		Local, regional, and national level participation in professional student organization activities.	Evaluation of student internships and field experiences

38. For associate's, Nexus, and bachelor's degree proposals, fill in the table below to demonstrate the link between the **learning outcomes** and NACE **career ready competencies**.
Insert more rows as needed.

Career Ready Competencies (NACE)	Student Learning Outcomes	Direct Measure (s)[1]
Critical Thinking/Problem Solving	Students will be able to perform literature reviews, identify knowledge gaps, formulate a hypothesis, and design experiments to test the hypothesis.	First and co-authored peer-reviewed manuscripts.
Oral/Written Communications	Students will be able to write a scientific research proposal and defend their approach to an audience of students and professors	Qualifying and oral defense exams.
Team Work/ Collaboration	Students will be able to work with a diverse teams and collaborators consisting of graduate/undergraduate trainees and professors	Participation in experiential learning activities; collaborative authorship of popular science and scientific research articles.
Digital Technology	Students will be proficient in the use of docment	Written assessments and oral presentations

	processing and data analysis software	
Leadership	Students will exercise leadership in professional student organizations in UGA and at local, regional, and national professional societies	Local, regional and national level participation in professional student organization activities.
Professionalism/ Work Ethic	Students will learn to be resilient, take responsibility for their actions, and develop professionalism and work ethic competencies.	Join professional societies and networking organizations. Take advantage of internship opportunities.
Career Management	Students will seek career development opportunities and develop plans and goals for a successful career	Successful transition into professional careers that offer growth and development.
Global/Intercultural Fluency	Students will value, respect, and learn from working in a diverse and multicultural environment	Pursue international careers and opportunities to work abroad

[1] Direct measures may include assessments, HIPs, exams, etc.

39. How will learning outcomes for the program be assessed?^ Attach the curriculum map for the upper division or major curriculum.

Student Learning Outcomes

	Student Learning Outcomes
Learning Outcome 1	Students demonstrate knowledge in genetics, cell biology, anatomy and physiology, and immunology in healthy and diseased states
Learning Outcome 2	Students understand molecular and cellular mechanisms that underlie disease and the limitations of current treatment strategies
Learning Outcome 3	Students understand current and emerging technologies supporting regenerative medicine research including stem cell therapies, biomaterials/tissue engineering, cell engineering, biomanufacturing, gene therapies, and novel devices and diagnostics
Learning Outcome 4	Students possess critical laboratory skills including aseptic technique, cell culture, gene delivery and editing, and common analytical techniques such as

	qPCR, ELISA, and immunocytochemistry/immunohistochemistry, flow cytometry, and statistical analysis
Learning Outcome 5	Students apply critical thinking skills to solve complex research problems focused on promoting tissue repair and regeneration following injury or disease using hypothesis-driven research
Learning Outcome 6	Students demonstrate highly proficient scientific literacy and communication (interpersonal, verbal, and written) skills
Learning Outcome 7	Students possess the knowledge and skills required to launch successful careers as scientific investigators in the regenerative bioscience or related fields

Ph.D. student progress within the program will be assessed annually by their major professor and the graduate coordinator. A student evaluation form will be used to assess progress and will evaluate the student on achievements in coursework, progress toward the comprehensive exam, progress toward their dissertation proposal and research, achievements in teaching (e.g., course evaluations), achievements in scholarship (e.g., conference submissions/articles in review for publication), and attainment of the learning outcomes noted above. In addition, long-term learning outcomes and skills will be assessed via exit interviews with doctoral students. The graduate coordinator will maintain all evaluation records.

Please see appendix for the student evaluation form.

40. How will outcomes for graduates of the program be assessed?
(Outcomes may include employment and placement rates, student or employer surveys, or other assessments of graduate outcomes)

The graduate coordinator will track alumni and their career paths after graduation. Graduates will be asked to complete a Qualtrics survey every 3 years which assesses their current occupation and if their education is of value in their current position. This survey will also aid in tracking employment and placement rate and in determining specific areas in the Regenerative Bioscience (Ph.D.) program that are considered the most valuable and which should be improved or changed.

41. List the entire course of study required to complete the academic program.^

Include course: prefixes, numbers, titles, and credit hour requirements

Indicate the word “new” beside new courses

Include a program of study

DOCTOR OF PHILOSOPHY in REGENERATIVE BIOSCIENCE

The program of study is developed by the student, the major professor, and the advisory committee during the first academic year. A preliminary program of study, developed by the major professor and the doctoral student and approved by a majority of the advisory committee, will be submitted to the graduate coordinator by the end of the student's first year of residence.

The program of study for students that hold a master’s degree in Biology, Cell Biology, or related fields is as follows:

- A minimum of 30 hours of course work
    - ADSC 8700, Special Problems in Animal and Dairy Science I, and ADSC 8710, Special Problems in Animal and Dairy Science II (maximum of 6 hours)

- ADSC 8800, Graduate Seminar (1 hour; minimum of 2 hours)
- ADSC 8888, Current Literature in Stem Cell Biology and Regenerative Medicine (1 hour; maximum of 3 hours)
- ADSC 9000, Doctoral Research
- ADSC 9300, Doctoral Dissertation (minimum of 3 hours)
- 3 credit hours of 6000- to 8000-level statistics or statistical computing course work
  - BIOS 7010 or BIOS 7010E, Introductory Biostatistics I
  - STAT 6315, Statistical Methods for Researchers
- 16 hours or more of 8000- and 9000-level courses
  - **Required**: 6 hours of graduate-level course work in Regenerative Bioscience selected from the following courses
    1) *ADSC 8120-8120L, Experimental Methods in Animal Biotechnology (3 hours)*
    2) *ADSC 8220, Materials in Medicine (3 hours)*
    3) *ADSC 8230, Neurobiology of Chemical Senses and Food Perception (3 hours)*
    4) *ADSC(BIOE) 8240, Engineering Stem Cell Therapeutics (3 hours)*
    5) *BIOE 8980, Advanced Topics in Biological Engineering(3 hours)*
  - Doctoral research (ADSC 9000), special problems (ADSC 8700, ADSC 8710), and dissertation writing (ADSC 9300) cannot be counted in these 16 hours
- Required for students who bypass a master's degree
  - Students must hold a bachelor's degree in a science-related field (e.g., Biology, Cell Biology, etc)
  - 4 additional hours of 6000- or 8000-level course work

A final typed program of study will be submitted to the graduate school prior to notification of the comprehensive examination.

No new courses will be developed to support this degree proposal

Example Program of Study:

Year One					
Fall Semester		**Credit Hours**	**Spring Semester**		**Credit Hours**
ADSC 8220	Materials in Medicine	3	ADSC 8120-8120L	Experimental Methods in Animal Biotechnology	3
ADSC (BIOE) 8240	Engineering Stem Cell Therapeutics	3	ADSC 8888	Current Literature in Stem Cell Biology and Regenerative Medicine	1
ADSC 8800	Graduate Seminar	1	ADSC 9000	Doctoral Research	4
ADSC 9000	Doctoral Research	5	STAT 6315	Statistical Methods for Researchers	4
Total Credit Hours		**12**	**Total Credit Hours**		**12**
Summer Semester					
ADSC 9000	Doctoral Research	9			
Total Credit Hours		**9**			
Year Two					

Fall Semester		Credit Hours	Spring Semester		Credit Hours
ADSC 8230	Neurobiology of Chemical Senses and Food Perception	3	ADSC 8888	Current Lit in Stem cell and Regen Med	1
ADSC 8800	Graduate Seminar	1	ADSC 9000	Doctoral Research	11
ADSC 9000	Doctoral Research	5			
BIOE 8980	Advanced Topics in Biomedical Engineering	3			
Total Credit Hours		**12**	**Total Credit Hours**		**12**
Summer Semester					
ADSC 9000	Doctoral Research	9			
Total Credit Hours		**9**			
Year Three					
Fall Semester		**Credit Hours**	**Spring Semester**		**Credit Hours**
ADSC 9000	Doctoral Research	12	ADSC 9000	Doctoral Research	12
Total Credit Hours		**12**	**Total Credit Hours**		**12**
Summer Semester					
ADSC 9000	Doctoral Research	9			
Total Credit Hours		**9**			
Year Four					
Fall Semester		**Credit Hours**	**Spring Semester**		**Credit Hours**
ADSC 9000	Doctoral Research	6	ADSC 9000	Doctoral Research	6
ADSC 9300	Doctoral Dissertation	6	ADSC 9300	Doctoral Dissertation	6
Total Credit Hours		**12**	**Total Credit Hours**		**12**

E. IMPLEMENTATION

42. Provide an enrollment projection for the next four academic years^

	Year 1	Year 2	Year 3	Year 4
Fiscal Year (Fall to Summer)	2022-23	2023-24	2024-25	2025-26
Base enrollment[1]		6	12	16
Lost to Attrition (should be negative)		0	0	0
New to the institution	3	5	6	8
Shifted from Other programs within your institution	3	1	0	0
Total Enrollment	6	12	18	24
Graduates	0	0	2	2

Carry forward base enrollment for next year	6	12	16	22

[1]Total enrollment for year 1 becomes the base enrollment for year 2

The average Ph.D. will take a student 4-5 years to complete the program.

a. Discuss the assumptions informing your enrollment estimates (i.e., for example, you may highlight anticipated recruiting targets and markets, if and how program implementation will shift enrollment from other programs at the institution, etc.)

1. The labor market in Georgia and nationally indicates a strong demand for RB Ph.Ds. The market research firm Polaris[1], indicates that North America generated the highest regenerative medicine revenue in 2019. The regenerative medicine market is projected to be worth $76.23 billion by 2026, with a compound annual growth rate (CAGR) of 20.5%. These projections are influencing growing national investments in regenerative medicine training and healthcare education programs [>5 new graduate(MS/PhD) progams in the past two years] and investments by federal agencies (NIH – Regenerative medicine innovation project; and Advanced regenerative manufacturing institute). The training and curriculum offered by the RB Ph.D. program will position students competitively for this expanding job market. Long-term state and national labor market projections for 2020-2030 suggest that RB Ph.D graduates will be well positioned to join the growing regenerative bioscience work force as Medical scientists (17% nationally; 21.3% GA), Biochemists and Biophysicists (4.9% nationally/10% GA), Biological Scientists (3.7% nationally; 3.7% GA), and Biological Science Teachers, postsecondary (12.7% nationally; 13.8% GA).

2. Although it is expected that several students currently pursuing Ph.D.'s with RBC faculty will switch from their current Ph.D. programs (e.g. Animal Science, Neuroscience, Toxicology) to the new Regenerative Bioscience program, efforts will be made to attract new students directly into the RB Ph.D. program in the first year. Most RBC faculty members mentor between 2-6 Ph.D. students on average.

3. A Regenerative Bioscience undergraduate major has been approved and the department conservatively projects that in Year 2 (2023-2024), 5 students will graduate with a major in Regenerative Bioscience (B.S.), 10 students in Year 3 (2024-2025) will graduate with a major in Regenerative Bioscience (B.S.), and in Year 4 (2025-2026), 15 students will graduate with a degree in Regenerative Bioscience (B.S.). Therefore, it is projected that students from the Regenerative Bioscience (B.S.) will be recruited to the Regenerative Bioscience (Ph.D.). If a quarter of these students were recruited to the RB Ph.D., this would result in approximately 1-2 students in Year 1, 2-3 students in Year 2, and 3-4 students in Year 3.

4. There are no formalized Ph.D. programs that are focused on providing interdisciplinary research and entrepreneurial training in Regenerative Bioscience in the state of Georgia, therefore it is expected that this program will be a significant draw for students graduating from other colleges across Georgia.

b. *If projections are significantly different than enrollment growth for the institution overall, please explain.*

The projections are not significantly different than anticipated enrollment growth for the institution overall.

43. If projected program enrollment is not realized in year two, what actions are you prepared to take?

If the projected enrollment is not realized, the department will consider altering the program to meet the needs of the students. The department will organize a regenerative bioscience curriculum committee to

reevaluate the curriculum to make this major more attractive. In addition, the ADS department has established a recruitment committee within the department. This group will be tasked to examine current recruitment methods and attempt to modify them to ensure better marketing and exposure to potential candidates for the Regenerative Bioscience (Ph.D.) program. The recruitment strategy will include an expanded marketing campaign and enhanced website design.

44. Discuss the marketing and recruitment plan for the program. Include how the program will be marketed to adult learners and underrepresented and special populations of students. What resources have been budgeted for marketing the new program?

    The Regenerative Bioscience (Ph.D.) is anticipated to begin fall semester 2023. Recruitment of Ph.D. students will occur within the state of Georgia and nationally via social media and targeted mailings of informative fliers and brochures. Informational emails will be sent via UGA and other Georgia university listservs, and dedicated webpages on the Regenerative Bioscience Center (RBC) and Animal and Dairy Science (ADS) websites will be established with information about the RB (Ph.D.) program.

    In addition, the ADS department has recently established a recruitment committee within the department. This group will examine on-going recruitment methods and attempt to modify them if enrollment projections are not met to ensure better marketing and exposure to potential candidates for the Regenerative Bioscience (Ph.D.) program.

45. Provide a brief marketing description for the program that can be used on the Georgia **OnMyLine website**.

    Regenerative bioscience research has had a direct impact on healthcare and medicine by contributing to the development of novel therapies for the treatment of diseases and injuries for which there are no cures. The Regenerative Bioscience (Ph.D.) will provide advanced interdisciplinary training opportunities for students in biomanufacturing of cellular therapies and tissues, biomaterials for tissue engineering, gene therapy, biomedical imaging, and biomedical computation. In addition to providing fundamental training in these areas, the program also aims to prepare students for non-academic careers by providing them with ample opportunities for entrepreneurship and technology commercialization training in partnership with the UGA Innovation Gateway.

46. If this proposal is for a Doctorate program, provide information below for at least three external and one USG reviewer of aspirational or comparative peer programs.
    Note: External reviewers must hold the rank of associate professor or higher in addition to other administrative titles.

Dr. Jose Cibelli	**Dr. Robert Guldberg**
Professor of Animal Science	Professor of Bioengineering
Department of Animal Science	Oregon State University
Michigan State University	guldberg@uoregon.edu
cibelli@msu.edu	
Dr. Johnna Temenoff	**Dr. Ke Cheng**
Professor of Biomedical Engineering	Professor of Regenerative Medicine
Department of Biomedical Engineering	Department of Molecular Biomedical Sciences
Georgia Institute of Technology	North Carolina State University
Johnna.temenoff@bme.gatech.edu	kcheng3@ncsu.edu

F. RESOURCES

F1. Finance^: Complete and submit the Excel budget forms and the questions below (Do not cut and paste in the excel budget template into this document, submit the Excel budget templates separately.)

47. Are you requesting a differential tuition rate for this program? (masters, doctoral, and professional programs only)

☒ No (Move to answer question 48)

☐ Yes (If yes, answer questions 47a & 47b)

a. *What is the differential rate being requested? The rate below should reflect the core tuition plus the differential, i.e. the tuition rate being advertised to the student.*

In-State per Semester: $Enter Amount

Out-of-State per Semester: $Enter Amount

b. *Provide tuition and mandatory fee rates assessed by competitive/peer programs per full-time student per semester. Please complete the table below:*

Institution name	Link to institution's tuition & fee website	In-state tuition	Out-of-state tuition	In-state fees	Out-of-state fees

48. If existing funds are being reallocated, describe the impact on existing programs and the plan to mitigate these impacts.

No funding or instruction will be lost by other units as a result of this program. Existing faculty lines budgeted for instruction will be utilized to cover instructional costs associated with all courses.

49. If student fees are being charged (excluding mandatory fees), explain the cost and benefit to students, per fee.

Not applicable.

50. Are there any additional financial costs that students will have to take on as part of this program, but not assessed directly by the institution? (e.g. software licenses, equipment, travel, etc.) If so, please describe these costs and what strategies you have considered to decrease the student's financial burden?

Not applicable.

51. How does the institution plan for and fund increased indirect costs associated with the growth in students anticipated in the proposed program? Consider costs such as student advisement, student support services, tutoring, career services, additional library materials, technology, or other infrastructure.

    Indirect costs will be covered by mandatory student fees and tuition.

F2. Faculty^ – Explain your faculty and staff plan for the program

52. Discuss how existing courses may be incorporated into this new program:

    a. Course Development

# of total courses in the curriculum:	**Enter # 10**
# of existing courses to be part of the new program	**Enter # 10**
Net number of new courses to be developed	**Enter # 0**

    b. Comment on the costs and workload related to the new course development.

    Not applicable.

53. Explain how **current faculty and staff** will contribute to the program.^

    a. How many faculty will be re-directed to this program from existing programs?

    Enter # 0

    b. If this program is approved, what will be the new teaching load and distribution of time for the current faculty members? How will existing staff be impacted?

    There will be no change in teaching load and distribution of time for current faculty members. All courses in this program have already been developed and are being taught by RB faculty.

    c. List the faculty that will be redirected from their current teaching load assignments to support this new program.

    Not applicable.

    d. Explain who will be teaching the existing courses that are being released so faculty can teach a new program course. Additionally, please discuss the fiscal implications associated with course releases and redirections of faculty.

    Not applicable.

e. What costs are included in your budget for course development? (Consider professional development, course development time buy out, overload pay, and re-training)

Not applicable.

f. Attach your SACSCOC roster for the proposed program. Include in parentheses the individual with administrative responsibility for the program and whether listed positions are projected new hires and/or currently vacant.

The SACSCOC Roster can be found in Appendix I.

54. Explain your plan for <u>new</u> faculty and staff for the program:

a. How many new faculty will be needed for this program over the next four years? Enter #0

Explanation: NONE

55. *How many new staff will be needed for this program over the next four years?*

Enter # 0

a. Discuss why new or additional staff resources are needed. Consider staff needs, support services (i.e. advisement, faculty support, etc.)

N/A

F3. Facilities – complete the questions below:

56. *Where will the program be offered?^ Mark all that apply*

☒ Main campus

☐ Satellite campus: Specify Here

☐ Other: Specify Here

☐ 100% Online

57. Will new or renovated facilities or space be needed for this program over the next four years?

☒ No

☐ Yes (*If yes, complete the table below, inserting additional rows as needed).*

Capital Costs for Needed Facilities and Space

Facility/Space Name	Gross Square Footage	Start Up Costs	Ongoing Costs	Est. Occupancy Date	Funding Source
New Construction					
Renovations and Infrastructure*					

Purchases: Land, Buildings etc.					
Lease space					
TOTAL Cost		**$0**	**$0**		

*Include the name of the building or location being impacted and what will need to be done.
Infrastructure includes new systems such as: water, electrical, IT networks, HVAC etc.

58. Discuss the impact of construction or renovation on existing campus activities and how disruptions will be mitigated. Explain how existing programs benefit from new facilities and/or space(s) and changes to existing space.

Not applicable.

59. Will any existing programs be negatively impacted (e.g. lose classroom or office space) by proposed facility changes? If so, discuss how the impacts of these changes will be mitigated.^

Not applicable.

60. Are any of these new facilities or major renovations listed in the table above (**Question 57**) **NOT** included in the institution-level facilities master plan?

Not applicable.

61. Will any of the following types of space be required: instructional, fine arts, meeting, study, or dedicated office?

☒ No (Move to Question 63).

☐ Yes (*If yes, complete question 62. Insert additional rows as needed).*

62. Complete the table below. Specify if these spaces are existing or new in the table below.^ If new, provide the semester and year of completion.

Space	New Space (ASF)	Use Existing Space (as is) (ASF)	Use Existing Space (Renovated) (ASF)	Semester/ Year of Occupancy
Dry Labs (STEM related)		N/A		

Wet Labs (STEM related)		Use existing space		
Dedicated Offices		Use existing space		
Fine Arts Spaces[1]		N/A		
Classrooms		Use existing space		
Meeting Rooms		Use existing space		
Student Study Space		Use existing space		
Other (Specify)		N/A		

[1]Fine arts spaces can include theatres, recital halls, visual arts studios, performing arts centers, recording studios, design labs, and other performance venues.

63. Are there facility needs related to accreditation?^ Are there any accreditation standards or guidelines that will impact facilities/space needs now or in the future? If so, please describe the projected impact.

Not applicable.

F4. Technology

64. Identify any major equipment or technology integral to program start-up and operations. List any equipment or assets over $5,000 (cumulative per asset) needed to start-up and run the program (insert rows as needed)

	Technology and Equipment	Start-up Costs	On-going Costs	Est. Start Date of Operations/Use
1	None			
2				
3				
4				
5				
6				
Total Technology Costs		**0**	**0**	

G. RISKS AND ASSUMPTIONS

65. In the table below, list any risks to the program's implementation over the next four years. For each risk, identify the severity (low, medium, high), probability of occurrence (low, medium, high), and the institution's mitigation strategy for each risk. Insert additional rows as needed. (e.g. Are faculty available for the cost and time frame).

Risk	Severity	Probability	Risk Mitigation Strategy
Faculty Teaching EFT	Low	Low	All faculty teaching graduate courses associated with this major have been involved with the development of the course work required and have agreed to teach these courses.
Course Availability	Low	Low	During the course of curriculum development, all departments have been communicated with and have agreed to allow students from the Regenerative Bioscience Ph.D. to take key courses in their departments (see departmental letters of support).

66. List any assumptions being made for this program to launch and be successful (e.g. SACSCOC accreditation request is approved, etc.).

    The assumptions associated with program success are:

    1. **Student enrollment.** The department has proposed an escalating student enrollment in the new Regenerative Bioscience (Ph.D.) over the next 4 years that will offset costs and lead to net positive revenue for the program. This is based on the recent approval of Regenerative Bioscience (B.S.), lack of similar graduate programs in the state of Georgia, and a growing employer need. Faculty believe that the estimated student enrollment numbers are conservative. However, if the Ph.D. is unable to reach anticipated student enrollment numbers, there are outlined key approaches to increase student enrollment.

    2. **Program costs.** The department has calculated current program costs, which consists mostly of faculty time needed to teach courses and faculty and staff time to administer the program. No new faculty or staff will be hired to initiate this program. Instead, faculty and staff that are already part of the Animal and Dairy Science Department will be used to support this program. The department sees this as an opportunity to grow overall student numbers and anticipates that the new Ph.D. program will result in a net positive in revenue that will cover these faculty and staff costs. There are minimal additional costs such as teaching supplies, as most facilities and resources are already in place. These additional costs are expected to be recovered through departmental contact hours.

H. INSTITUTION APPROVAL

Have you completed and submitted the signature page?

I. APPENDIX I

SACSCOC Roster

1	2	2	3	4
NAME (F, P)	**Rank**	**COURSES TAUGHT** **Including Term, Course Number & Title, Credit Hours (D, UN, UT, G) [Dual]** Note – for substantive change prospectuses/applications, list the courses *to be taught*, not historical teaching assignments	**ACADEMIC DEGREES & COURSEWORK** Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	**OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught**
Francis Fluharty	Professor (Department Head)	None	M.S., The Ohio State University Ph.D., The Ohio State University	RB Administration
Holly Kinder	Lecturer	**Fall:** ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G) **Spring:** ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G)	Ph.D. University of Georgia	RB Administration
Franklin West	Associate Professor	**Fall:** ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G) **Spring:** ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G)	Ph.D. University of Georgia	

1	2	2	3	4
NAME (F, P)	**Rank**	**COURSES TAUGHT** **Including Term, Course Number & Title, Credit Hours (D, UN, UT, G) [Dual]** Note – for substantive change prospectuses/applications, list the courses *to be taught*, not historical teaching assignments	**ACADEMIC DEGREES & COURSEWORK** Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	**OTHER QUALIFICATIONS & COMMENTS** **Related to Courses Taught**
Hongxiang Liu	Associate Professor	**Fall:** ADSC 8230*: Neurobiology of Chemical Senses and Food Perception (3hr)(G) ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G) **Spring:** ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G)	M.D., Henan Medical University (currently Zhengzhou University) M.Sc., Henan Medical University (currently Zhengzhou University) Ph.D., Beijing Medical University (currently Peking University)	
Lohitash Karumbaiah	Associate Professor	**Fall:** ADSC 8220*: Materials in Medicine (3hr)(G) ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G) **Spring:** ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G)	M.S. Griffith University, Brisbane, Australia Ph.D. The University of Georgia	
Yao Yao	Assistant Professor	**Fall:** ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G) **Spring:** ADSC 8120-8210L*: Experimental Methods in Animals Biotechnology (3hr)(G) ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G)	Ph.D. Chinese Academy of Sciences	

1	2	2	3	4
NAME (F, P)	**Rank**	**COURSES TAUGHT** **Including Term, Course Number & Title, Credit Hours (D, UN, UT, G) [Dual]** Note – for substantive change prospectuses/applications, list the courses *to be taught*, not historical teaching assignments	**ACADEMIC DEGREES & COURSEWORK** Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	**OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught**
Steven Stice	D.W. Brooks Professor & GRA Eminent Scholar	**Fall:** ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G) **Spring:** ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G)	M.S., Iowa State University Ph.D., University of Massachusetts	
Luke Mortensen	Assistant Professor	**Fall:** ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G) ADSC(BIOE) 8240*: Engineering Stem Cell Therapeutics (3hr)(G) **Spring:** ADSC 9000*: Doctoral Research (G) ADSC 9300*: Doctoral Dissertation (G)	M.S. University of Rochester Ph.D. University of Rochester	

** A course change to RBIO will be submitted upon approval of the major and prefix*

Annual Graduate Student Evaluation Form

Animal and Dairy Science Department

This form is to be completed by the Major Professor, shared with the student, and returned to the Graduate Coordinator by [date].

Student Name: _____ Started Program (Semester and year): ___

Degree Objective: _____ Est. Graduation (Semester and year): ___

Major Professor: _____

For each trait below, use the following rating: 1= unsatisfactory, 2 = meets expectations, 3 = exceeds expectations.

1.	Exhibits an intellectual curiosity and efforts towards gaining an in-depth understanding of student's topic area and supporting disciplines	
2.	Self-motivation and initiative	
3.	Verbal and written communication skills	
4.	Ability to work independently	
5.	Ability to define research problems and organize research accordingly	
6.	Participation in seminars, journal clubs (indicate specific program(s):	
7.	Seminar presentations by the student Dates _____	
8.	Ability to manage time effectively	
9.	Ability to communicate effectively with major professor	
10.	Progress toward completion of project / thesis / dissertation research	
11.	Participation in professional activities (regional, national meetings, extension, outreach, industry interaction) **Specific activity (name, location, date): ___**	
12.	Completion of duties assigned as part of assistantship	
13.	Overall Progress toward degree	

YES NO

Meeting with advisory committee in last year ? Has

student developed a research proposal?

Has Program of Study been filed **(due in 1st yr)**? Write any comments or explanations on reverse side.

Signatures:

_____	_____	_____	_____
Major Professor	Date	Student	Date

Board of Regents of the University System of Georgia
270 Washington Street, SW
Atlanta, GA 30334

RE: Letter of Support for the proposed PhD degree in Regenerative Bioscience, University of Georgia

To the Board of Regents of the University System of Georgia

On behalf of Boehringer Ingelheim, we would like to convey our strong support for the newly proposed PhD program in Regenerative Bioscience at the University of Georgia (UGA).

Boehringer Ingelheim is a leading research-driven biopharmaceutical company dedicated to the discovery, development, manufacturing, and marketing of innovative human and animal health products in areas of high unmet medical need. Boehringer Ingelheim develops small molecules, vaccines, devices, and other novel therapeutics from the discovery stage to scale up, substance manufacturing, fill/finish, packaging, and distribution. To achieve our goals, we rely on a highly skilled workforce of over 50,000 employees worldwide with more than 1,700 working in the state of Georgia, making Boehringer Ingelheim one of the largest Bioscience employers in the state. We therefore keenly appreciate the value of a highly trained and qualified workforce.

The curriculum for the Regenerative Bioscience PhD program has a strong composition of courses that will provide the technical skills needed to be a successful scientist including experimental design, statistics, and basic lab techniques. In addition, there is significant emphasis on theoretical knowledge in advanced regenerative topics such as cell therapies, biomaterials, and genetic engineering. We also commend the focus placed on soft skills. Successful PhDs often lead large teams of diverse people, and knowing how to communicate, organize activities, and apply critical thinking are vital skills that students will gain from this program.

We look forward to working with future graduates from the UGA Regenerative Bioscience graduate program.

Sincerely,

Boehringer Ingelheim

Dr Francis Milward, DVM, MS
Global Innovation, Global Head Development
Boehringer Ingelheim Animal Health USA Inc.
1730 Olympic Drive, Athens, GA 30601, USA
P: +1 706 552 2418 C: +1 404 353 8438
francis.milward@boehringer-ingelheim.com

GEORGIA BIO™
The Life Sciences Partnership

CENTER FOR GLOBAL HEALTH INNOVATION

March 29, 2022

Board of Regents of the University System of Georgia
270 Washington Street, SW
Atlanta, GA 30334

RE: Letter of Support for the proposed Doctoral Program in Regenerative Bioscience, University of Georgia

Dear Distinguished Board Members,

On behalf of Georgia Bio and its member companies, I would like to convey my strong support for the newly proposed Doctor of Philosophy degree program in Regenerative Bioscience at the University of Georgia.

Georgia Bio, a division of the Center for Global Health Innovation, is a private non-profit trade association whose mission is to advance the growth of Georgia's life sciences industry and foster strategic partnerships that can create a healthier world. To accomplish this mission, Georgia Bio works on behalf of 200 member organizations to drive public policy, build a network of industry leaders, create access to capital, introduce cutting-edge STEM education programs, and create robust value-driven purchasing programs.

The proposed Ph.D. in Regenerative Bioscience has several strengths that make it advantageous to students seeking careers in academic research and industry. These include a comprehensive curriculum that provides strong foundational training in biomanufacturing of cellular therapies and tissues, biomaterials for tissue engineering, gene therapy, biomedical imaging, and biomedical computation. Additionally, the program also aims to prepare students for non-academic careers by providing them with ample opportunities for entrepreneurship, technology commercialization, and experiential training via the National Science Foundation's Innovation Corps (I-Corps), in partnership with the UGA Innovation Gateway.

Although industry continues to be a leading driver of employment in the area of regenerative medicine, there is a dearth of highly skilled individuals required to meet academic and industry needs. Employment projections from the Georgia Department of Labor predict that the biomedical and life-science sectors will continue to rapidly expand, resulting in a steady demand for highly skilled biomedical professionals. We anticipate that graduates from the proposed Regenerative Bioscience Ph.D. program will be especially well prepared to meet industry needs for highly skilled, career-ready individuals in this field. I encourage you to approve the proposed Ph.D. in Regenerative Bioscience at the University of Georgia. We look forward to working with graduates of this important program in the not-too-distant future.

Sincerely,

Maria Thacker Goethe, MPH
President & CEO
Georgia Bio / BioEd Institute
CEO, Center for Global Health Innovation
404-920-2042 | mthacker@cghi.org

CMaT
NSF Engineering Research Center
for Cell Manufacturing Technologies

March 27, 2022

Dear Distinguished Board Members,

On behalf of the NSF Center for Cell Manufacturing Technologies (CMaT), I am excited to support the new University of Georgia Regenerative Bioscience Ph.D. program. As you know, CMAT seeks to transform the manufacturing of cell-based therapeutics into a large-scale, lower-cost, reproducible, and high-quality engineered process, for broad industry and clinical use. Both the University of Georgia and Georgia Institute of Technology are lead institutions for our research program and are heavily involved in our innovation ecosystem program with industry partners. We are in our fifth year and have a growing group of over 40 industry partners and many prospective companies that are interested in joining CMaT. Through our frequent conversations and collective engagement with industry, we are becoming aware of the challenges in filling the demand for highly-skilled Ph.D. level scientists and engineers in the fields of biomedical research, cell manufacturing, and regenerative medicine.

The field of Regenerative Bioscience is expected to grow exponentially in the years to come and it will take a concerted effort to educate and train a highly skilled workforce to meet industry and academic demands in cell manufacturing, regenerative medicine, and data analytics. The interdisciplinary Regenerative Bioscience Ph.D program at UGA is a very timely addition to our institutional training and development capabilities in the state of Georgia, and will focus faculty expertise in the above areas to provide high quality research and entrepreneurial training in Regenerative Bioscience. This type of training is highly relevant to our initiative and to our many industry partners, and would lead to a highly desirable workforce. I am confident that graduates from the Regenerative Bioscience Ph.D program would have many opportunities for careers in industry, academia, and federal agencies.

Sincerely,

Krishnendu Roy, PhD
Director, NSF Center for Cell Manufacturing Technologies (CMaT)
Director, Marcus Center for Therapeutic Cell Characterization and Manufacturing (MC3M)
Director, Center for ImmunoEngineering
The Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory
The Parker H. Petit Institute for Bioengineering and Biosciences
Georgia Institute of Technology, Atlanta, GA

Board of Regents of the University System of Georgia
270 Washington Street, SW
Atlanta, GA 30334

RE: Letter of Support for the proposed graduate program in Regenerative Bioscience, University of Georgia

Dear Distinguished Board of Regents Members of the University System of Georgia,

On behalf of Rubhu Biologics, we would like to convey our strong support for the proposed graduate program for Regenerative Bioscience at the University of Georgia (UGA).

As a biological research organization with a focus in the development of bio-therapeutics, Rubhu Biologics has a vast understanding of the necessary skills required for individuals to be successful in the field. It is evident there is a need for those emerging from graduate programs to have the aptitude and practical experience in areas such as tissue engineering, cell therapies, and gene therapy.

The field of regenerative biosciences is evolving and the expectations and requirements of the next generation of scientists ever increasing. The innovative and transformative curriculum is impressive. The students graduating from this program are likely to have the right combination of theoretical knowledge spanning a diverse number of fields and the practical skill sets to perform universal biological science techniques (e.g. RT-PCR, western blots). It is of notable frequency in which Rubhu and our neighboring companies interview individuals that lack the credentials to excel in the rigorous positions that the scientific community demands, highlighting the need for such a training program in Georgia.

We are very excited to work with the faculty and trainees in the Regenerative Bioscience graduate program and eustatically look forward to hiring future graduates.

Sincerely,

Surendra J. Chavan. PhD
Chief Executive Officer
Rubhu Biologics, Inc

Documentation of Approval and Notification

Proposal: Major in Regenerative Bioscience (Ph.D.)

College: College of Agricultural and Environmental Sciences

Department: Animal and Dairy Science

Proposed Effective Term: Fall 2023

Approvals:

- Animal and Dairy Science Department Head, Dr. Francis Fluharty
- College of Agricultural and Environmental Sciences Associate Dean, Dr. Josef Broder
- Graduate School Associate Dean, Dr. Anne Shaffer

Letters of Support:

- Boehringer Ingelheim Animal Health USA, Inc. Global Head Development, Dr. Francis Milward
- Georgia Bio President and CEO, Maria Thacker Goethe
- NSF Center for Cell Manufacturing Technologies Director, Dr. Krishnendu Roy
- Rubhu Biologics, Inc. Chief Executive Officer, Dr. Surendra Chavan