

Human Biology Comprehensive Program Review

General and Overview

1. Describe your program's most significant opportunities and significant challenges.

Opportunities

Nutritional Science (Undergraduate Program)

Careers in nutrition are in high demand, and the need for credentialed professionals like Registered Dietitian Nutritionists (RDN's) is expected to increase much faster than the average for all occupations between now and 2028. This is linked to the role of nutrition in the prevention and treatment of chronic diseases, which are the leading causes of death and disability in the United States and contribute greatly to the \$3.5 trillion spent annually in health care costs. RDN's are needed as food and nutrition experts to prevent chronic disease, improve community access to safe and healthful foods, and promote sustainable food systems.

The reputation of UW-Green Bay's nutrition science program continues to grow, and the program is increasingly regarded as one of the leading nutrition programs in the state and throughout the Midwest. Student, alumni, and faculty accolades demonstrate the excellence that the program embodies, and the program is continually strengthened through a planned process of assessment and continuous quality improvement. Student retention and completion of the program is near 100%. This creates opportunity to market the program to a larger audience of prospective students, increasing enrollment and thus training a greater number of food and nutrition leaders to meet regional and state-wide needs. The addition of UW-Green Bay's MS in Nutrition and Integrated Health in fall 2021 may also serve as an opportunity to further increase visibility and enrollment in the program.

Master of Nutrition and Integrated Health Program

As stated under the "Nutritional Science (Undergraduate Program)" section, nutrition-related careers and the need for RDNs are increasing beyond that of other professions. In addition, the increasingly complex demands of the nutrition field demand more in depth knowledge, training and skills. To meet these needs, our national accrediting agency, the Accreditation Council for Education in Nutrition and Dietetics (ACEND) has mandated that as of 2024 the minimum degree requirement needed to become a registered dietitian (RDN) will move from a baccalaureate to a master's degree. Our future graduate program will build upon our long-standing undergraduate nutrition programs by meeting this new entry-level master's degree requirement. Food systems and nutrition-related health problems are increasingly complex and require Nutritionists with more interdisciplinary, and functional nutrition medical knowledge to be effective members of healthcare teams in clinical settings, and to address community, public health and food system challenges.

The strong reputation of our undergraduate nutrition science program provides one of the more valuable opportunities for attracting prospective students to our new master's program. From our surveys, there appears to be considerable interest in one of the focuses of our master's program – integrated and functional nutritional medicine. We see this focus as an opportunity to attract students to our program and provide a curriculum that particularly addresses the largest burden in health care -the prevention and treatment of dietary and lifestyle related chronic diseases. In

addition, our new STEM Culinary Medicine Food lab and partnership with the Medical College of Wisconsin, provide opportunities that enhance what our program has to offer to prospective students.

Master of Athletic Training Program

According to National Athletic Trainers' Association (2019), Athletic trainers (ATs) are highly qualified, multi-skilled health care professionals who collaborate with physicians to provide preventative services, emergency care, clinical diagnosis, therapeutic intervention and rehabilitation of injuries and medical conditions. Athletic trainers work under the direction of a physician as prescribed by state licensure statutes. Athletic training is recognized by the American Medical Association (AMA), Health Resources Services Administration (HRSA) and the Department of Health and Human Services (HHS) as an allied health care profession.

According to the Bureau of Labor Statistics (2019), the job outlook for athletic trainers across the nation is anticipated to grow by as much as 21.3% from 2014-2024, which is much faster than the average for all occupations. There is a projected 18% increase in the number of athletic training jobs in Wisconsin from 2012-2022. Similarly, Wisconsin Department of Workforce Development's 2012-2022 projections indicate a 14.83% increase in health care occupations throughout the state.

Studies examining the availability of athletic trainers (AT) in high schools across Wisconsin found that of the 400 schools that sponsor interscholastic teams in Wisconsin, only one-third have high AT availability, meaning an AT is available on a daily basis during school, practice and competition hours (equivalent to 35-40 hours a week). Another third of the schools have mid AT availability (during school and at varsity and sub-varsity events, or 10 to 15 hours per week). The rest have low AT availability (1 hour a week during the school day and at home varsity football games, or about 1 to 1-1/2 hours a week total) or no AT coverage at all. The largest region that lacked AT coverage was in the rural portion of Wisconsin. This is particularly problematic as 36% of Sport Related Concussion injuries occur during non-game situations. The Master of Athletic Training program was developed at UW-Green Bay to help address the issue of a lack of qualified healthcare providers able to provide athletic training services across the state, but specifically to the Northeastern Wisconsin region.

The Tiny Earth Partnership (Students, Faculty, Microsoft, Pipeline programs)

The relationship between Tiny Earth (Jo Handelsman, Director of the Wisconsin Institute of Discovery at UW-Madison and Founder of Tiny Earth) and UW-Green Bay has grown over the last three years. UW-Green Bay's co-chairing of the steering committee for the winter 2020 international symposium and placement on the leadership team provide opportunities for access and guidance. Faculty and students at UW-Green Bay have an opportunity to be a part of this international effort (e.g., 28 countries and 45 states) to isolate, identify and characterize antibiotic-producing bacteria in soil. A recent Microsoft award has been obtained to apply Microsoft's artificial intelligence platform (i.e., Azure) to develop predictive models to identify antibiotic-producing bacteria of interest in soil environments. The project relies on access to the international Tiny Earth soil database, the largest in the world and involves a collaboration between Computer Science faculty at UW-Green Bay, GIS expertise in CSET, Chris Houghton, Human Biology and the Wisconsin Institute of Discovery, Madison, WI. Human Biology's

leadership in the creation and oversight of the annual winter symposium has facilitated and strengthened partnerships with area businesses and institutions that have served as symposium sponsors and/or participants, including Bellin Hospital, Nature's Way, Cherney Microbiological, MCW-Green Bay, Saint Norbert College, College of Menominee Nation, NWTC, and the Green Bay Packers. The current development of an academic pipeline program facilitated by our Tiny Earth partnership between UW-Green Bay and Green Bay West High School/Franklin Middle School's Serious About Stem program (SAS) for at-risk high school female students is another benefit of the partnership. Starting this summer, students from Green Bay West High School will be trained in techniques needed to prepare them for immersion into the Tiny Earth curriculum over 14-weeks during the fall term at UW-Green Bay. These students will then present their research at the winter symposium of 2021 along with their college mentors from UW-Green Bay. Future plans are to enlist the participation of the Education program (assessment, student teaching). This could lead to multi-institutional grant opportunities (MCW-Green Bay, Green Bay Public Schools, Wisconsin Institute for Discovery, Howard/Suamico schools; however, the potential is significantly hampered by workload and resource deficiencies at UW-Green Bay.

Curriculum:

Human Biology faculty have discussed the development of an integrated approach to study human biology. Modifications to the curriculum could lead to the implementation of a Human Biology seminar/research course, bringing our faculty, students and curriculum to collaborate in a novel manner. Discussions on the design of a Health Science Building at the UW-Green Bay campus, whose design emphasizes this integrated view of human health (molecules, cells, tissues, organs, body systems) both reflect and mirror the integrated curriculum opportunity introduced here. In essence, the health science building and the integration of our curriculum to study human biology effectively are mutually reinforcing enterprises that are likely to facilitate unique collaborations among HUB faculty as well as with faculty across campus, including those anticipated to populate the Health Science building.

Challenges

Nutritional Science Undergraduate Program

As of January 2024, new registered dietitians will be required to complete a minimum of a master's degree to earn their credential. New and prospective students have become increasingly hesitant to pursue a nutrition career when faced with the financial and time commitment of adding a master's degree to their plan. Many are choosing other healthcare professions which yield a higher occupational salary relative to the educational cost and commitment.

There are only three full-time nutrition faculty, which is a small number given the administrative and curricular demands of an accredited program which requires experiential and practicum learning. The three faculty have additionally been burdened with the development and launch of the new MS in Nutrition and Integrated Health. Faculty are expected to maintain their current responsibilities while simultaneously developing and teaching in the new program without the approval of addition of any new faculty. This is unsustainable and an abuse of the university's human capital.

Athletic Training Program

The UW-Green Bay Master of Athletic Training (MAT) program is currently undergoing the accreditation review process required by the Commission on Accreditation of Athletic Training Education (CAATE). This process is voluntary, however in order for graduates of the MAT to sit for the Board of Certification for the Athletic Trainer exam and be eligible for licensure in most states, they must graduate from a CAATE accredited program. An accreditation decision for the MAT should be known by June 2021. Program personnel believe the MAT meets the accreditation standards of the CAATE, but accreditation is not guaranteed.

At this time, the MAT has two full time (core) faculty that also serve in administrative roles for the program. Accreditation standards require that faculty in administrative roles be provided release or reassigned time for these duties. The MAT is a 62-credit program, which is taught primarily by the two core faculty members in addition to administrative responsibilities. This has created a situation where both faculty members in the MAT are working in an overload capacity.

Systemic challenges (Faculty lines, Salaries, Scholarship)

Inadequate number of faculty lines

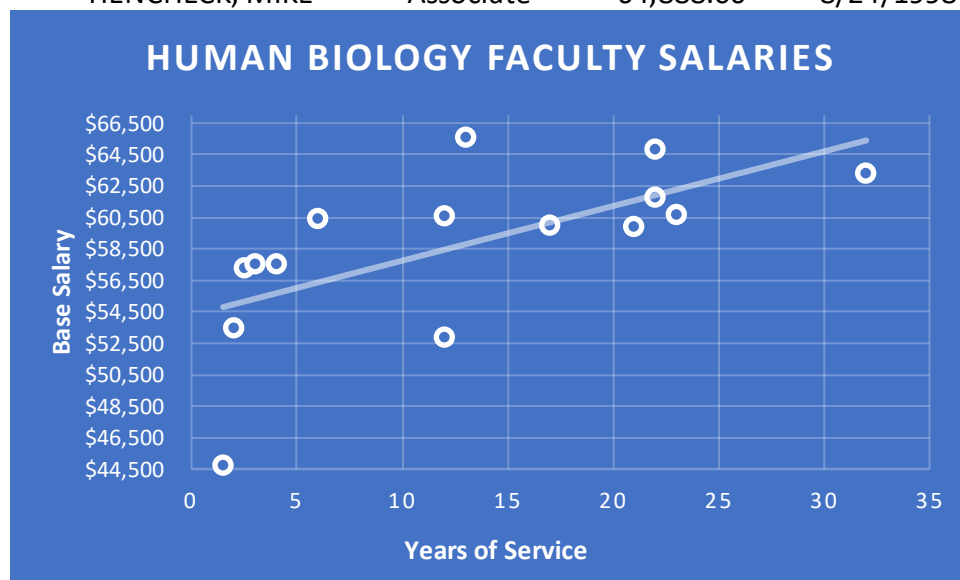
HUB has a limited number of tenure-track faculty to manage current capacity, including the new graduate program in nutrition with similar concerns related to the graduate program in athletic training as indicated. The accreditation process for the undergraduate program in Dietetics is arduous and remains understaffed. Microbiology, Anatomy and Physiology, Human Disease and Society are among the many courses facing significant enrollment pressure. James Marker has a 2X overload this spring (2021) because of student demand for Anatomy and Physiology. Over the last year, two existing faculty and one lecturer have adopted Human Disease and Society to their teaching loads to accommodate the expanding demand for Human Disease and Society alone. The implementation of the six-week accelerated program, the Nursing program and the Community Health Education program have exacerbated demand for HUB course offerings, including Human Disease and Society, Microbiology, Anatomy and Physiology, etc.

Inadequate salaries

Human Biology faculty with 9-month appointments make less than \$65,650 annually, including a faculty member with more than 32 years of service. Additionally, salary compression has been an ongoing source of morale decay with years of service and rank out of line with the incoming salaries of junior faculty (see chart below). Many faculty pursue overload and summer teaching opportunities to address both the lack of course availability for students during the fall/spring and a desire to earn more money. This “catch-22” leaves faculty less time for scholarship, placing HUB at a disadvantage to achieving promotion to full professor, thereby leaving HUB faculty overall in a poorer position to extract salary adjustments from the University merit pool relative to other programs consisting of 1 or more full professors.

The summary below highlights the current realities of faculty salaries within the Human Biology program. William Gear and Sadie Buboltz-Dubs have 12-month appointments. Dan Meinhardt and Amanda Nelson have 50% appointments in HUB.

Names	Rank	Salary	Hire Date
BRUSICH,DOUGLAS	Assistant	57,306.00	8/21/2017
HEYRMAN,GEORGETTE	Assistant	57,612.00	8/22/2016
KHALILI,SETAREH	Instructor	45,900.00	8/20/2018
KIBBE,CARLY	Assistant	57,612.00	1/6/2017
MARKER,JAMES	Associate	63,355.00	8/25/1988
MEINHARDT,DANIEL	Associate	30,038.00	8/25/2003
MERKEL,BRIAN	Associate	60,687.00	8/25/1997
MUELLER,PAUL	Assistant	60,489.00	8/25/2014
NELSON,AMANDA	Associate	32,825.00	8/27/2007
PEARSON,DEBRA	Associate	61,791.00	8/24/1998
POTT,UWE	Associate	59,931.00	12/20/1999
WAGNER,SARA	Instructor	55,147.00	8/22/2011
ZHU,LE	Associate	60,631.00	8/25/2008
DALBERG, JARED	Associate	52,949.00	8/25/2008
BUBOLTZ-DUBS, SADIE	Assistant	66,300.00	4/1/2019
GEAR, WILLIAM	Assistant	71,400.00	8/1/2018
HENCHECK, MIKE	Associate	64,888.00	8/24/1998



Regression analysis comparing salary and years of service of assistant and associate professors. 12-month faculty and 50% faculty salaries have been adjusted to 9-month salary and 100% equivalents, respectively.

According to the regression analysis above, many associate professor salaries are low relative to many assistant professors despite the raise accompanying promotion and years of service. There are two assistant professors making less than their assistant professor colleagues and less than one of our full-time instructors. Moreover, HUB has a member of its Executive Committee, earning less than one of our full-time instructors. We also have assistant professors with salaries greater than associate professors despite the raise in salary associated with tenure and promotion.

Does or should the institution have policies on this? To what extent does promotion to associate professor incentivize faculty outside of the penalty of failing a bid for tenure? Ultimately, these realities are inherently and wholly demoralizing to all faculty wherever they sit on the salary spectrum.

Scholarship

Human Biology research is generally expensive, universally time-consuming and competes largely with faculty from R1 institutions for external grant awards and inclusion in top-tier journals (e.g., Doug Brusich experience highlighted below).

Unlike other sciences, Human Biology researchers are not eligible to apply for many external funding opportunities, including USDA grants or many NSF awards, leaving HUB faculty to compete with faculty in R1 institutions for many funding opportunities. Doug Brusich is perhaps our best and most recent example of this reality. Dr. Brusich is a recent hire and he has been productive using a cost-effective research model that is amenable to undergraduate participation and hands-on learning. However, reviewers for a relatively modest Early Career Award from the American Epilepsy Society listed features of the UW- Green Bay environment and Dr. Brusich's position as weaknesses. These criticisms included Dr. Brusich's large teaching load, which is consistent with teaching loads across HUB, the exclusive reliance upon undergraduate researchers, and the small start-up budget (see below). These criticisms are simply realities of the position for faculty in HUB, or even characteristics (e.g., extensive undergraduate involvement), that we consider sources of job satisfaction. Nonetheless, these realities have negative consequences on procurement of external funding and publications in top-tier journals, especially considering the R1-level competition (see below).

<p>Applicant Question Score: Does the applicant have appropriate experience and training? Are the collaborators and other researchers well suited to the project? Does the applicant hold an academic appointment of Assistant Professor or equivalent? If the applicant has another early faculty appointment (e.g. Instructor, Adjunct, etc), is there clear indication that they have the support of their institution for an independent research program? :</p> <p>Strengths:</p> <ul style="list-style-type: none">• A strong applicant with experience in the TBI/fly field and proven independence (senior author paper published).• He is an assistant professor in a tenure-track position.• The PI has experience in studying neuronal hyperexcitability and epilepsy in flies from his graduate work.• He received a modest start up, but was able to receive additional funds from his institute (modest, too).• Letters are very strong, ranking the applicant very high (e.g., among graduate students)• He participated in a FUTURE postdoc program that allows to split time between teaching and research, preparing the applicant very well for a job as a faculty working with undergraduates. <p>Weaknesses:</p> <ul style="list-style-type: none">• The PI appears to have a lot of teaching requirements during the academic year.• The PI has focused on teaching in undergraduate settings and therefore has a modest publication record (but see comment above).• There are no collaborators, and there does not seem to be an on-site mentor. <p>Environment Question Score: Are the institutional support, equipment, and other physical resources available to the applicant adequate for the project proposed? Will the project benefit from unique features of the scientific environment, subject populations, or collaborative arrangements? :</p> <p>Strengths:</p> <ul style="list-style-type: none">• Although an undergraduate institution, there seem to be plenty of opportunities to receive small amounts of funding (which the applicant took advantage of in the past).• The PI and institute has all required equipment.• It seems if anything, the (relative inexpensive) fly project is the most appropriate for an undergraduate institute with limited resources for research. <p>Weaknesses:</p> <ul style="list-style-type: none">• The PI is at an undergraduate institution that only provided very little start up. It is unclear how this project will be supported after the end of funding.• The PI will entirely depend on undergraduate researchers.• There does not to be on-site experience for epilepsy or TBI. Previous collaborators are not at the institute and do not seem to be involved in the proposed research.
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Figure 1: Reviewer Criticisms from Dr. Brusich's American Epilepsy Society Grant

<p>Ukpong Eyo, PhD <i>Targeting microglial P2Y12R to ameliorate febrile status epilepticus</i> University of Virginia</p>	<p>Emily Johnson, MD <i>Late-onset epilepsy, cognition, and biomarkers</i> Johns Hopkins University School of Medicine</p>	<p>Vaishnav Krishnan, MD, PhD <i>Neurodevelopmental Consequences of Fetal Anticonvulsant Exposure</i> Baylor College of Medicine</p>	<p>Elliot Smith, PhD <i>Intercitally derived probabilistic maps of seizure onset location</i> University of Utah</p>	<p>Fraser Sparks, PhD <i>Adult-born granule cell microcircuit reorganization in epilepsy</i> Columbia University Medical Center</p>
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Figure 2: Researchers successfully funded from the American Epilepsy Society opportunity (R1 institutions)

Georgette Heyrman has been unable to apply for NIH funds prior to December of 2019 due to the lack of an Institutional Biosafety Committee (IBC) on campus. To address this shortcoming of the UW-Green Bay environment, she took on a sizeable role organizing and chairing this committee which detracts from time spent doing research. UW-Green Bay is now registered with the NIH as of December 2019 due to her leadership, dedication hard work and resolve. Though required to apply for many external awards, IBC requirements impose additional workload demands upon faculty (e.g., satisfying protocol and training requirements). R1 institutions have a dedicated IBC office to manage the majority of tasks left to Georgette Heyrman and the IBC committee, including support to faculty submitting protocols for approval.

Many Human Biology faculty rely on mammalian cell culture systems to conduct their research as cell culture systems are vital to understanding human health and disease. The development and maintenance of these systems require time, money and significant commitment by faculty to train undergraduates to conduct experiments that utilize this technology. As a catch-22, guiding undergraduate students in independent study is an expectation of faculty, however, to do so comes at a cost to progress in scholarship given the investment required by faculty to train students.

2. What are some things that would help make your program and its students more successful?

Additional faculty lines and significant salary adjustments

Human Biology is desperate for additional tenure-track faculty to manage current demands of the program. This intensity of this capacity/resource problem began in earnest when Associate Professor Donna Ritch left Human Biology in 2007 to take a position as Associate Dean of Liberal Arts and Sciences. The vacancy in Human Biology remains unfilled to the detriment of the program (e.g., Microscopic Anatomy “Histology” and Anatomy and Physiology) More recently, Human Biology developed graduate programs in nutrition and athletic training without the faculty lines to operate and accredit them. Additionally, HUB has formed a collaboration with Concordia University to provide students an opportunity to earn an undergraduate degree in Human Biology from UW-Green Bay and a Ph.D. in pharmacy (PharmD) degree from Concordia University (“3+4 program”). Moreover, the ongoing demands of the teaching commitments of five associate professors in Human biology to teach for the Medical College of Wisconsin represent another workload concern. Currently, the nature, number and intensification of programs and enterprises of HUB faculty significantly exceed existing capacity.

HUB salaries are incompatible with student, program and CSET success. As an example, faculty require time in the summer to conduct the research they simply cannot perform during the fall and spring because of workload requirements (i.e., the Doug Brusich grant review). However, many faculty pursue teaching opportunities because of financial need, providing revenue streams for the institution, and additional opportunities for students to take classes they are unable to

access during the fall and spring due to a lack of faculty/course offerings. The negative impact of the ongoing salary profile of HUB faculty is a systemic challenge, negatively impacting all aspects of contribution by the program to its students, institution and region. As redress, adjustments to faculty salaries must be made to reconcile compression for morale and faculty recruitment purposes. Stipends and/or substantial faculty raises are needed to increase the productivity and quality of faculty research, teaching, and service for similar reasons.

Additional reassignments

The relatively new opportunity for faculty to earn course reassignments is helpful, but not nearly adequate to pursue meaningful research with undergraduates during the fall and spring semesters. Failing to do so will continue to hamper productivity of existing faculty and negatively impact the hiring of additional faculty interested in pursuing meaningful scholarship.

Needs of our students (Professional Programs)

A large number of HUB graduates go on to professional programs. These professional program requirements are ever evolving, which requires regular curricular reviews and updates at the undergraduate level. Moreover, successful admission into these programs requires independent study research experience. Human Biology are currently unable to meet the demand of these critical experiences due to a limited number of faculty and time. It is worth noting that some faculty spend their “unpaid” summers doing research with students awarded the Summer Sandmire internship but are in no way compensated for their time.

Teaching large courses, especially the “gateway” courses

The teaching of highly enrolled courses, including Biology 201, Introduction to Human Biology 102, Genetics, Anatomy and Physiology, Microbiology and the associated effects on student success and the faculty workload, especially the gateway courses (Human Biology 102 and Biology 201) is an ongoing pedagogical and workload challenge.

2. What are some program accomplishments worth highlighting?

The Human Biology faculty provide a plethora of individual learning experiences for students. These learning experiences include internships, independent studies, independent research studies, lab teaching assistantships, and lecture teaching assistantships. These learning experiences enhance students’ acceptance rate into grad programs, many of which require a research experience for acceptance into their program. The Human Biology curriculum contributes to several academic programs (courses, Executive Committees, etc.) and virtually every category of general education required for graduation.

- Founder’s Award for Excellence in Community Outreach, Nutrition (2019)
- CATL Online/Hybrid Program Development Grant Award - \$20,000, Nutrition (2019)
- Launch of new culinary lab in the STEM Innovation Center, Nutrition (2019)
- Over the last eight years, *six* of the Wisconsin Academy of Nutrition and Dietetics Outstanding Student Award winners were from the UW-Green Bay Nutrition Science program
- Over the last six years 82/90 (91%) seniors applying for supervised practice to become a registered dietitian have earned a match. This is in comparison to the <70% average nationwide.
- One of five nutrition programs nationwide to receive a Produce for Better Health Grant, (2016)
- Outstanding Service Project Award – Dietetics Health and Fitness Club (2014)
- Establishment of the Medical College of Wisconsin (MCW)-Green Bay partnership

- Health Science, Exercise and Cytotechnology emphases' graduates entering professional programs (i.e., Alumni list and ongoing meetings with Advancement as evidence)
- Appointment of Brian Merkel to the Wisconsin Institute for Discovery Leadership Team, UW-Madison (Tiny Earth), 2019
- Co-chair Tiny Earth International Symposium (2020), chair of winter symposia 2018, 2019, Merkel
- Development, implementation and chairing of the Institutional Biosafety Committee for UW-Green Bay, Georgette Heyrman
- Graduate Program in Nutrition
- Graduate Program in Athletic Training
- 3+4 dual degree program with Concordia University--PharmD/Bachelor Degree in HUB, Amanda Nelson
- UW Board of Regents Teaching Excellence Award Nomination, Brian Merkel 2019
- Medical College of Wisconsin Outstanding Teaching Award (Uwe Pott and Brian Merkel) 2018
- Establishment of the Human Biology Seminar Series, Amanda Nelson and Carly Kibbe
- Outstanding Dietetics Educator of the Year award, Wisconsin Academy of Nutrition and Dietetics (2017)
- UW-Green Bay Outstanding Advisor award, Debra Pearson, 2013-2014
- COVID-19 Panel (Global Studies, Human Biology, Nursing) March 2020
- Microsoft Award (2020-2022), \$30,000. Predictive models to identify antibiotic-producing bacteria in soil environments, Brian Merkel, Iftekhar Anam, Chris Houghton
- MCW-Green Bay Professional Development Award, \$55,000 (Biotek multimode plate reader). Merkel, Heyrman, Kibbe, Mueller.
- MCW-Green Bay Professional Development Award, \$6780.47 (Development of gene-culture interaction: The role of COMT and DRD4 genotypes on attention and lateral prefrontal activities in children). Pott (2018)
The award provided significant funding for collaborative research with Dr. Sawa Senzaki in UW-Green Bay's Psychology Department, which resulted in a recently accepted publication.
- CSET Award--\$22,500. FluorChem Western Blot and Gel Imager System. Heyrman, Mueller, Pearson.
- Sager Award for Excellence in Scientific Scholarship, 2020. Evaluating synergism between vitamin D and omega-3 Fatty Acids in Ovarian Cancer Cells. Ruchita Patel and Brooke Breitrick. Advisors: Heyrman, Pearson, Mueller.
- Chan Zuckerberg Award—Tiny Earth/HUB Outreach to area high school students and teachers to participate in the fall 2019 Tiny Earth research curriculum \$2,000. Merkel
- CSET Early Career Faculty Award, Brusich - \$7,900
- Numerous Poster presentations (Academic Excellence, Rotunda, Tiny Earth Symposia, UW-Green Bay Winter Symposia)-2013-2020
- Numerous interviews (WPR, local media--newspapers, television).
- The Mammalian Cell Culture Core Facility developed/implemented (Incubators, Biological Safety Cabinets) to train students and support faculty research in this critical form of scientific methodology
- MCW-Green Bay grant (\$17,250) to install an underwater weighing system to be used for assessing percent body fat ala densitometry (see proposal).
- Lab-mod grant to obtain dissection lights to enhance the dissection experience. Surgical/dissection lights (\$11,023).
- The development and implementation of a merit rubric for teaching, scholarship and service
- The development and implementation of Human Biology's first tenure document

3. Have there been any significant changes that have affected your program?

The four-college system and creation of the College of Science, Engineering and Technology has led to a significant increase in administrative attention for Human Biology, especially as it relates to program advocacy and faculty support. New academic programs (Community Health,

Nursing, and the accelerated course program) have imposed additional enrollment pressure on many HUB courses and faculty.

4. Where do you want your program to be 5 to 7 years from now?

Human Biology requires resources (e.g., faculty lines, significant salary adjustments, and reassignments) to meet the demands of the program, its students and faculty, and to be compatible with the mission of UW-Green Bay. At this time, the institutional environment for HUB is more compatible with a teaching paradigm given current workload and other institutional “weaknesses” noted by reviewers of Professor Brusich’s external grant proposal. Human Biology strongly advises the institution to remedy the institutional weaknesses cited in the review to support the type of research of interest or wholly support the current “teaching institution” focus and adjust institutional policies (tenure, promotion and merit) to reflect the nature of our current situation. The disconnect between the mission of the university, especially as it relates to scholarship in HUB in the context of an environment incompatible with productive, quality output is longstanding and has led to the failure of tenure bids by two faculty with expertise in the area pertinent to this review. It is the opinion of the chair of Human Biology, that as supportive of Human Biology and resourceful as Dean Katers is in his attempts to ameliorate the institutional weaknesses cited, these challenges go far beyond the level of the Dean’s office. Ironically, this review of Human Biology begs an examination and remedy of the institutional/system policies and neglect that have led to the current reality.

Demand

Faculty trends

At the time of this review, Human Biology consists of 8 Associate Professors, 6 Assistant Professors and three full-time instructors. At the conclusion of spring 2021, HUB will lose one Associate Professor (physics) position retirement; his replacement will join NAS. Prior to 2018, HUB consisted of three fewer tenure-track faculty. Bill Gear and Sadie Buboltz-Dubs were hired recently to develop, operate and supervise the time-consuming graduate program in athletic training. Jared Dalberg joined HUB as a part of Project Coastal. Appointments for two faculty have been reduced to 50%, Amanda Nelson and Dan Meinhardt. As such, despite the addition of three faculty during the period of this review, the overall capacity of HUB to accommodate the number of students and the proliferation of initiatives in the program is at an all-time low.

Faculty trends in the context of enrollment pressure and concerns related to changes in graduation requirements

From 2013-2020, student enrollment has ranged from 243 (2014-2015) to 581 (2016-2017) to the latest recorded enrollment relative to this review of 502 (2019-2020). Most Human Biology faculty have joint appointments in Biology and Chemistry. These are now standalone majors (Change to graduation policy implemented 2018-2019). Historically, these students would major or minor in Human Biology to meet graduation requirements. This change in graduation requirements has negatively impacted our enrollment numbers to the benefit of NAS (Chemistry and Biology) to the resource allocation peril of Human Biology. Despite this reality, the significant workload (e.g., teaching courses, program development and oversight) relative to faculty appointments in Biology and Chemistry remains unchanged, impacting the attention HUB faculty provide to their home unit.

Internal

Program goals (Mission, vision, learning outcomes; present as narrative/lists)

Human Biology is committed to studying and teaching human structure and function, patterns of reproduction and development, genetics, nutrition, and behavior as it exists presently and as it relates to human evolution and diversity. Human Biology provides a fully accredited program in human nutrition/dietetics and includes graduate programs in athletic training and nutrition. To this end, Human Biology:

- Includes within the program and among teaching faculty representatives from several disciplines
- Offers a major and minor that includes courses from the natural science disciplines.
- Offers training in the skills of laboratory investigation and opportunities for practical experiences in areas related to human biology.
- Offers a range of courses that provide a portion of the liberal arts education of a student's academic work.
- Maintains a commitment to outreach and continuing education geared especially to regional needs.
- Supports the graduate programs by its faculty serving on graduate committees and teaching courses for graduate credit.
- Encourages scholarly activity among its faculty, especially applied research, and also encourages basic research in various areas related to human biology.
- Includes within its major, an orientation towards a liberal education degree as well as areas of emphases that have applicability to careers and/or post-baccalaureate education.

Learning Outcomes

1. Demonstrate a basic knowledge of molecular / biochemical processes.
2. Demonstrate a basic knowledge of cell structure, organelles and cellular processes.
3. Demonstrate a basic knowledge of the anatomy and physiology of human organs and organ systems.
4. Demonstrate an understanding of the impact of evolutionary forces on the human organism.
5. Demonstrate an understanding of the ecological context of humans.
6. Demonstrate an understanding of the impact of nutrients on human physiology.
7. Demonstrate an understanding of the interactions of exercise and human physiology.
8. Demonstrate an understanding of scientific processes, including inductive and deductive reasoning, formulation of hypotheses and experimental design.
9. Demonstrate an understanding of research methodologies and the relative value of information obtained from experiments involving observation, correlation and examination of cause/effect relationships.
10. Know and execute state-of-the-art laboratory techniques.
11. Analyze and interpret scientific information.
12. Demonstrate an appreciation for the ethical and social dimensions of science, as well as weaknesses/limitations and assumptions of science as practiced in the US.
13. Demonstrate the awareness, understanding and skills necessary to work in a diverse world.

Curriculum development

The development of curricula (i.e., courses) is ongoing to support the relatively new graduate programs in athletic training and nutrition. Developing, updating and teaching the curricula

required for the education of medical students (MCW, MCW-Green Bay) by five HUB faculty are challenging, ongoing efforts.

Connections to other programs

Chemistry, Biology, Global Studies, Women's Studies, Community Health Education, Music, Nursing, Art, Psychology. These contributions to these programs by Human Biology consist of faculty participation in 1 or more of the following ways: executive committees, courses, research collaborations, panel discussions.

Number of courses offered

Approximately 130 courses. All lab courses may be offered in hybrid or face-to-face formats. All lecture courses may be offered face-to-face or virtually. Modifications to teaching modalities in response to COVID-19 have greatly exacerbated the workload burden.

Diversity of students, faculty, and curriculum

From 2013-2019, the percentage of graduates that are white dropped from 90%-82%, respectively. The percentage of majors that are white dropped from 90% to 77% during the same period. The percentage of first-generation students to graduate dropped from 50% to 40% during the same period. HUB consists of 8 tenure-track male faculty and 5 tenure-track female faculty. Additionally, HUB consists of 4 female instructional staff.

Gen Ed, FYS/GPS, CCIHS

Gen Ed

Biological Sciences

HUM BIOL 102 Introduction to Human Biology
HUM BIOL 206 Fertility, Reproduction, and Family Planning
HUM BIOL 217 Human Disease and Society
HUM BIOL 318 Reproductive Biology
HUM BIOL 405 Biotechnology and Ethics
NUT SCI 242 Food and Nutritional Health
NUT SCI 260 Childhood Obesity: Challenges and Solutions

Ethnic Studies Perspective

NUT SCI 202 Ethnic Influences on Nutrition

Fine arts

MUS APP 127 Instrumental lessons (Craig Hanke)

Global Culture

HUB 217 Human Disease and Society
NUT 250 World Food and Population Issues

Natural Sciences

Physics 141 Astronomy

Quantitative Literacy

Physics 103 Fundamentals of Physics I

Physics 201 Principles of Physics I

Sustainability Perspectives

HUM BIOL 205 Biotechnology and Human Values

HUM BIOL 206 Fertility, Reproduction, and Family Planning

HUM BIOL 215 Personal Health and Wellness

HUM BIOL 217 Human Disease and Society

HUM BIOL 250 Fitness for Life

HUM BIOL 322 Epidemiology

HUM BIOL 405 Biotechnology and Ethics

NUT SCI 250 World Food and Population Issues

CCIHS

HUM BIOL 102 (7 high schools)

First Year Seminar

HUM BIOL 198: Death, Dying and Science

HUM BIOL 198: "Why Do Men Have Nipples?"

GPS

COMM SCI 146: "Why Do Men Have Nipples?"

COMM SCI 146: "Art and Science"

Program support and staffing

Current staff (ADA, Jenny Zeitler, and USA2, Taylor Hilgart) are now shared among three budgetary units with the addition of the Engineering program to CSET. Moreover, the addition of two graduate programs in Human Biology and the undergraduate program in Nutrition require considerable administrative support as they are subject to accreditation. Lab manager, Mark Damie, has long labored above and beyond the capacity of any one individual to serve the lab course and research needs of HUB and NAS faculty and students. Additional lab staff is required to meet the needs and growth of CSET programs, including HUB.

Cost per credit hour (TBD)

External

1. Outreach: student/faculty partnerships, collaborations, participation with organizations or individually
NWTC, Laboratory Science Technology Advisory Committee Meeting, Tiny Earth
MCW-Green Bay
Wisconsin Institute for Discovery (Tiny Earth)
College of Menominee Nation (Tiny Earth)
Saint Norbert College (Tiny Earth)
Bellin Internship Program for Pre-Medical Students
Ovarian Cancer Community Outreach (December 2016-March 2019)
STEAM Engine presentations

“COVID-19, the latest but not the last pandemic” Learning in Retirement (Nov. 2020)
Serious About Stem Program Mentor Program with Human Biology students

2. Contributions to regional infrastructure

Tiny Earth outreach efforts with East High School, West High School, Bay Port High School, Ashwaubenon High School, West De Pere High School, De Pere High School. Many of HUB graduates enter Nursing programs, Medical programs, PT programs etc., and populate their respective professional occupations in the region.

Einstein Project

3. Scholarly activity of faculty

Brusich DJ, Spring AM, James TD, Yeates CJ, Helms TH, Frank CA. 2018. *Drosophila* CaV2 channels harboring human migraine mutations cause synapse hyperexcitability that can be suppressed by inhibition of a Ca²⁺ store release pathway. *PLoS Genetics*. 14(8):e1007577.

Putnam LJ, Willes AM, Kalata BE, Disher ND, **Brusich DJ**. 2019. Expansion of a fly TBI model to four levels of injury severity reveals synergistic effects of repetitive injury for moderate injury conditions. *Fly*. doi:10.1080/19336934.2019.1664363

Willes AM, Krcmarik TR, Daughtry AE, **Brusich DJ**. 2020. Repetitive mild traumatic brain injury causes synergistic effects on mortality. *BioRxiv Preprint*. doi:
<https://doi.org/10.1101/2020.12.22.424055>. Under peer review at *microPublication Biology*.

Hoersten T, Gray A, Payne EK, **Gear W**, Hageman J. Investigating concussion knowledge in US born versus internationally born collegiate student-athletes in the United States. *Clinical Journal of Sport Medicine*. Accepted for publication 04/23/2020.

Gear WS, Lundstrom MJ. Effect of ankle taping on dynamic balance and perception of stability. *Journal of Sports Medicine and Allied Health Sciences*. 4(2): 1-6, 2018.

Reilly J, **Zhu L**, Olsen-Hunt, M, Flood, B. Comparison of Rural Childhood BMI Percentiles: Prevalence and Trends in a Midwest County, 2008-2016. *Journal of School Nursing*. First published August 15, 2019.

Young, A., **Moyle-Heyrman, G.**, Kim, J.J., Burdette, J.E., Microphysiologic systems in female reproductive biology. *Experimental Biology and Medicine*. 2017, Nov;242(17)1690-1700. DOI: 10.1177/1535370217697386

Moore, L.K., Caldwell, M.A., Townsend, T.R., MacRenaris, K.W., **Moyle-Heyrman, G.**, Rammohan, N., Schonher, E.L., Burdette, J.E., Ho, D., Meade, T.J. Water-soluble nanoconjugate for enhanced cellular delivery of receptor-targeted MR contrast agents, *Bioconjug Chem* **2019** Nov 20;30(11)2947-2957.

Gurtu, A., Akhtar, N., Verma, M., Singh, K., **Moyle-Heyrman, G.**, Bakshi, M. Functionalized iron oxide – metal hybrid nanoparticles for protein extraction from complex fluids. *Ind. Eng. Chem. Res.* **2020**, 59, 3, 1045-1055.

de Souza AH, Tang J, Yadev AK, Saghafi ST, **Kibbe CR**, Linnemann AK, Merrins MJ, Davis DB. Intra-islet GLP-1, but not CCK, is necessary for β -cell function in mouse and human islets. *Scientific Reports*. 2020 Feb 18;10(1):2823.

Senzaki, S., **Pott, U.**, Shinohara, I., Moriguchi, Y. Roles of culture and COMT Val58Met gene on neural basis of executive function: A comparison between Japanese and American children. *Developmental Psychobiology*. Accepted for publication December 2020.

Student Success

1. High-impact practices and individualized-learning opportunities
Human Biology Seminar Series

Travel Course

HUB 499: “Whispering from Beyond”

Tri-Beta (National Undergraduate Biological Science Honor Society)—publication, grants, presentation opportunities. Human Biology leadership obtained and continues to supervise our chapter.

Tiny Earth Curriculum, Symposia (Advanced Microbiology)

Independent Studies (TA, Literature reviews, research in labs)

Internships (graduate-level internships in Athletic Training, undergraduate level internships in nutrition, medicine, dentistry, microbiology, physical therapy, exercise science)

HUB Scholarship Opportunities

2013-2016: HUB offered traditional scholarships for aspiring juniors and seniors primarily pursuing a career in medical-related professions. Jeremy Green Scholarship: \$750 total; Donel Sullivan Scholarship: \$1300 total; and Sandmire Scholarship of \$5000 total. We typically gave out six scholarships per year.

2015-2016: HUB received a significant gift from the Sandmire family of one million dollars to be used to support student success. This translates into a total of \$45,000 in the Sandmire fund which has allowed a multi-level expansion of scholarship opportunities for students that started in 2017-2018 until present.

HUB now gives out more than 20 scholarships each year. The current HUB scholarships are:

Jeremy Green Scholarship: \$750 total (juniors and seniors pursuing medicine)

Donel Sullivan Scholarship: \$2500 total (juniors and seniors pursuing medicine)

Sandmire Scholarship: \$15,000 total (juniors and seniors pursuing a broad spectrum of careers in health and wellness)

Sandmire Scholars program: \$2000 each year for four years (incoming freshmen of Human Biology major)

Sandmire Summer Research Internship: up to \$20,000 total for student stipend and research materials

Sandmire Grants in Aid: up to \$1000 for each award, for professional development opportunities for students and faculty

2. Retention

Human Biology faculty have developed a culture of commitment to student success (pre-graduation and post-graduation). The extensive and varied list of alumni to be targeted for donations for scholarships and mentor opportunities speak to this commitment. The culture has been cultivated by the process inherent in faculty searches and the mentoring of junior faculty by senior faculty within HUB.

Mission Relevant

1. Relevance to mission

The Human Biology program relates in multiple ways to the mission of the University of Wisconsin-Green Bay as it provides an undergraduate major and minor that includes problem solving, critical thinking and the development of practical career skills. Additionally, the Human Biology unit contributes to the UW-Green Bay mission objectives of providing excellent and innovative teaching in a curriculum that supports pre-professional training, interacting with local organizations, and inter-institutional collaboration to facilitate student success.

2. Cultural enrichment

International Tiny Earth Winter Symposium 2020 (Public health inequities)

Inclusivity training HUB faculty fall 2020

One of the learning competencies of the undergraduate dietetics requirements states: "KRDN 2.6: Demonstrate an understanding of cultural competence/sensitivity." This is evidenced by at least 75% of students earned a B or better on the assignment to educate community members who are of diverse cultural background in Community Nutrition course for the past 10 years. The nutrition education lessons were delivered to a group of Hmong seniors at the Salvation Army of Green Bay.

Dietary acculturation study - 2017-2018. Worked with the office of International Education and the Counseling and Health Services of UWGB on a human study looking at acculturation process among international students who were new to UWGB in fall 2017. The research involved taking biometric measurements of the subjects, periodic blood draws to establish lab data for glucose and lipid panel, and interviews and surveys on students' perception about American diet. (Pearson, Zhu)

Grandparents University Summer camps - Healthy Cooking camp for children and their grandparents to learn about healthy cooking in a hands-on, fun environment.

Culinary Medicine Workshops for Medical College of Wisconsin medical students. Hands on workshops in our STEM culinary medicine food lab in which our Nutrition Science students interact with medical students to enhance the medical students' working knowledge of the role of nutrition in disease prevention and treatment.

Sustainability and Agriculture Summer Camp with Oneida Nation - for grades 9-12 Oneida Nation members, provides interactive experiences to learn about sustainable agriculture, food, nutrition and health through a variety of field trips to local farms, the grocery store, a hydroponic growing facility and more.

3. Access (Does the program have any agreements with other institutions? For example, a transfer agreement with a technical college.)
 - PharmD Concordia University
 - NWTC