**Annual Biomedical Sciences Program Assessment Report for the Academic Year 2007-2008**

I. Assessment Activities

A. *Program Goals*: The primary goal of the Biomedical Sciences M.S./Ph.D. program continues to focus on producing graduates who have broad didactic knowledge in the biomedical sciences, but also specialized research training in one of our five interdisciplinary research clusters: Cancer Biology; Neuroscience and Developmental Biology; Cardiovascular Disease, Diabetes and Obesity; Toxicology and Environmental Health Sciences; and Molecular Mechanisms of Pathogenesis.

Another BMS program goal is to offer a non-thesis M.S. degree in the Medical Sciences area of emphasis. This area is designed to improve the science foundation of students seeking admission in M.D. programs. With the addition of a full-time Graduate Admissions counselor, we have gradually increased the size and qualifications of students in this area of emphasis. In the '07-'08 AY we capped the size at 15 students, but could have accepted a number of additional qualified students. Our goal is to have 80% of these students gain admission into an allopathic or osteopathic school of medicine. For the Medical Sciences students who entered this program in the 2006-2007 academic year, 9 of 10 (90%) have been accepted into a school of medicine.

B and C. *Learning outcomes/data collection and Results:* We have identified six student outcomes important to the Biomedical Sciences Program. These learning outcomes, assessment activities associated with them, and results are summarized in the following paragraphs and the accompanying chart.

1. Mastery of basic knowledge about cellular and molecular biology. This outcome is assessed through the examinations given in BMS 600, Foundations of Biomedical Science, which is a required course for all BMS students. Assessments were organized by the course director, Dr. Todd Green. The benchmark is an average of 80% or better on the examinations, which corresponds to a letter grade of B or better. In 2007-2008, 20 of 22 students successfully met this standard. For the next academic year, this course was improved by updating several of the lectures and including several new instructors. Dr. Todd Green will again be the course director for the 2008-2009 academic year.

2. Ability to make oral presentations of scientific material. This outcome is assessed by evaluation of student seminars and other oral presentations in BMS 680, Seminar. Assessments were organized by the course director, Dr. Elaine Hardman. Student presentations were evaluated by peers according to a point system. The benchmark was a

rating of “satisfactory” by a faculty evaluation committee. In 2007-2008, 40 of 40 students met this benchmark. Students were advised by faculty in the BMS Communications course about how to improve their presentations. Dr. Elaine Hardman will again be the course director for the 2008-2009 academic year.

3. Basic aptitude for laboratory research. This outcome is assessed during a series of laboratory rotations which are overseen by the BMS Mentoring Committee. The assessment is accomplished through a laboratory rotation evaluation form completed by each faculty member supervising a laboratory rotation. The benchmark is a satisfactory evaluation in each of three lab rotations. In this ’07-’08 AY, 7 of 7 students met the benchmark.

4. Mastery of comprehensive knowledge of biomedical sciences (Medical Sciences MS students only). This outcome is assessed by means of the Medical Sciences Comprehensive Exam which is an objective exam covering the four required courses for Medical Sciences students (Biochemistry, Cellular and Molecular Biology, Neurophysiology, and Microbiology). The exam is coordinated and administered by the Director of Graduate Studies, Dr. Vernon Reichenbecher. The benchmark is a 70% or higher score on the exam. In 2007-2008, 1 of 1 student met this benchmark. Prior to the next administration, the exam will be updated to ensure assessment of the most relevant material.

5. Mastery of comprehensive knowledge of biomedical sciences (Research MS and Ph.D. students only). This outcome is assessed by each student’s advisory committee after most or all coursework has been completed. Both written and oral comprehensive exams are used as assessment tools. Beginning this year, each student is required to write a research proposal as part of this examination, thus unifying the style of exam for all students. Benchmarks are determined by each advisory committee and are evaluated subjectively by each committee. In 2007-2008, 6 of 6 students successfully met the benchmark.

6. Ability to design and conduct original biomedical research. This outcome is assessed by the defense of a written Ph.D. dissertation. The assessment is performed by each student’s advisory committee, which sets the benchmarks for each individual Ph.D. student. At least four of the five committee members must rate the written dissertation and defense as satisfactory. In 2007-2008, 2 of 2 students met the benchmark.

III. Plans for the 2008-2009 academic year

- Implement plans outlined in our newly awarded STEM Fellows grant including:
    - Grant writing workshops for graduate students to help in applying for predoctoral fellowships.
    - Phasing in, with students admitted to the Ph.D. program in Fall '09, 50% instead of full stipend support from the BMS program for students at the time they enter their third year of graduate study. The other 50% of their stipend will be the responsibility of their Ph.D. advisor or the department in which their advisor holds a faculty appointment.
    - Increase the diversity of the BMS program by establishing a summer minority undergraduate research fellowship program.

- Development of a new software package for tracking graduate student applications. In addition to reminders to send sequential follow-up material and messages, it will provide more data for assessment of our graduate student pool.

- Launching of a BMS alumni newsletter. We will use this newsletter to connect with our alumni base. The hope is to get referrals of students for our BMS graduate programs and to eventually receive contributions to help grow and strengthen the BMS program.

IV. Assistance Needed: We will contact the UAC for information and/or assistance as needed.

V, What one most important thing has the program learned through this process

This annual assessment report, together we our recent competitive renewal of the STEM Fellows grant has given us metrics to examine how our graduate program has progressed over the last several years. As a result, several areas were identified as in need of improvement and they have been included as program goals for the next academic year.

# Marshall University
## Assessment of Student Outcomes: Component/Course/Program Level

**Component Area/Program/Discipline: Biomedical Sciences YEAR: 2005-2006**

| Component / Course / Program Level | | | | | |
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| Student Outcome | Person or Office Responsible | Assessment Tool or Approach | Standards/Bench mark | Results/Analysis | Action Taken |
| Mastery of basic knowledge about cellular and molecular biology | BMS 600 Course Director, Dr. Todd Green | Examinations in BMS 600 (Foundations of Biomedical Science) | 80% average on examinations; letter grade of B or better | 20 of 22 students successfully met the benchmark | Lectures were updated; several new instructors in course |
| Ability to make oral presentations of scientific material | BMS Course Director, Dr. Elaine Hardman | Seminar evaluation form | Satisfactory rating by the faculty evaluation committee | 40 of 40 students successfully met the benchmark | Continuation of mini-symposium for Medical Science Students |
| Basic aptitude for laboratory research | Mentoring committee | Laboratory rotation evaluation form | Satisfactory evaluation in 3 lab rotations | 7 of 7 students successfully met the benchmark | Each future student will be assigned a faculty mentor |
| Mastery of comprehensive knowledge of biomedical sciences (Medical Sciences MS only) | Director of Graduate Studies, Dr. Vernon Reichenbecher | Medical Sciences comprehensive objective exam | 70% score on exam | 1 of 1 student successfully met the benchmark | Exam will be updated to reflect new material and changes in courses |

| Component / Course / Program Level | | | | | |
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| Student Outcome | Person or Office Responsible | Assessment Tool or Approach | Standards/Benchmark | Results/Analysis | Action Taken |
| Mastery of comprehensive knowledge of biomedical sciences (Research MS and Ph.D. students) | Student advisory committees | Written and oral comprehensive exams (subjective evaluation by committee) | Benchmarks determined by each committee | 6 of 6 students successfully met the benchmark | Unified style of exam for all students. |
| Ability to design and conduct original biomedical research | Student advisory committees | Defense of written dissertation (subjective evaluation by committee members) | Benchmarks determined by each committee | 2 of 2 students successfully met the benchmark | Areas of emphasis reflect research areas, rather than discipline-based areas |