UNIVERSITY OF DETROIT MERCY SCHOOL OF DENTISTRY
DEPARTMENT OF BIOMEDICAL SCIENCES
Course Syllabus

Biochemistry/Molecular Biology
DBS 820

Course Information

Web address: http://knowledge.udmercy.edu/

Course Director

Michael J. Gleason, PhD, DDS
Office Room 432
Office Hours: by appointment
Phone: 494-6636
Email: gleasomj@udmercy.edu

Winter Term 2008

DS1 Students (Class 2011)
Room 2470 Monday 9:00 - 9:50
Room 2470 Thursday 10:00 - 11:50

Credit hours: 3
Prerequisites: DBS 815

Lecturers/Support Faculty

Lecturers

Michael J. Gleason, PhD, DDS

Academic Policies:

All policies in the School of Dentistry Academic Policies Handbook including but not limited to academic integrity, mandatory attendance, professional decorum & dress code, identification (ID) badges, preclinical and classroom decorum, use of cell phone and electronic devices, examination policies and exam/quiz absences apply.

Accommodations:

If you would like to request a classroom, testing, preclinical, clinical, or other accommodation because of a legally protected disability, or if you might require any special assistance in the event of an emergency or evacuation, please contact the University of Detroit Mercy's Office of University Academic Services (UAC) at 313-578-0310 or email your request for information to gallegem@udmercy.edu

Course Evaluation Policy:

Student feedback is valued by faculty and the administration. All students are required to complete the School of Dentistry's on-line course evaluation by a specified date. Failure to comply by posted deadline dates will result in the receipt of an F (Failing) grade of record for the Evaluation Responsibility Course. Only constructive, professional recommendations will be reported and considered.

Course Description:

Purpose of the Course:
The topics considered in Biochemistry/Molecular Biology are devoted almost exclusively to the human system. This emphasis is partially due to curriculum time constraints and also to the school and department philosophy that the Dental biochemistry/molecular biology course sequence provides basic information which is subsequently utilized by many other departments. Due to the fundamental nature of much of the material presented, this course is given in the second term of the first year of the dental curriculum. The Biochemistry/Molecular Biology course sequence is designed to enable dental students to achieve an understanding of the molecular interactions that are ultimately related to dental health and disease.

Course Goals:
The goals of the Biochemistry sequence are to:

1. provide a basic knowledge of cellular processes
2. enhance the understanding that biological process are at their root the result of standard chemical reactions
3. provide the basis for further study in basic and clinical sciences
4. foster the understanding that the human system functions under the same set of principles as are taught in standard undergraduate science courses

Course Objectives:
At the conclusion of this course, the student should have a knowledge of:

1. Gene structure, replication, regulation, and expression.
2. The synthesis and role of various RNA molecules, as well as, process and control of protein synthesis.
3. Post-translation modification of proteins and the mechanisms of sorting and destruction of proteins with an emphasis on collagen and other extracellular proteins.
4. The formation, structure and function of the extracellular matix.
5. The formation and function of selected proteins and formed elements found in the blood with an emphasis on those involved in blood clotting and oxygen transport.
6. The molecular biology of wound healing.
7. The function of receptors and their role in the control of cellular events and communication.
8. The general molecular biology of oncogenesis.
9. The basic of mineralization of hard tissues and the remodling/resorption of bone.
10. The basic components of saliva and the role played in the maintenance of oral health

Instructional Methods:
Instructional methods utilized in this course include lecture and class participation exercises. The opportunity for out of class time questions and, if requested, review sessions will also be provided. Review questions for examinations will be presented during class.
Review sessions will be scheduled at student request.

School of Dentistry Competencies:

Competency-based Education: Assumes that learning to become an entry-level professional is a progression through stages from novice to competent.

Stages of Progression to Competence:
F or Foundation Knowledge: Basic knowledge, skills, and attitudes needed to begin the journey to competence.

N or Novice Level: Ability to articulate or describe the appropriate skills, knowledge, and professional attitudes. Novices need structure, clarity of goals, single and clearly explained approaches.

B or Beginner Level: Combines the appropriate skills, knowledge, and professional attitudes, all of which are performed with guidance and correction.

C or Competent Level: Combines the appropriate supporting skills, knowledge, and professional attitudes, all of which are performed reliably without assistance.

	Competencies of the Graduating Dental Student	Addressed	Evaluated	Method
1.	The graduating student obtains, records, updates and organizes accurate and completed medical/dental histories including pertinent psychological and socioeconomic information.	NO	NO	NA
2.	The graduating student performs, records and organizes a physical assessment appropriate for dental care.	NO	NO	NA
3.	The graduating student determines differential, provisional or definitive diagnoses by correlating and interpreting examination and assessment findings.	YES	F	WRITTEN
4.	The graduating student develops alternative treatment plans which are sequenced to address the chief complaint, eliminate oral disease, restore function, and maintain health, and prevent oral disease consistent with assessment and diagnoses.	YES	F	WRITTEN
5.	The graduating student establishes with the patient a mutually acceptable treatment plan.	NO	NO	NA
6.	The graduating student monitors and provides for patient comfort associated with dental care.	YES	F	WRITTEN
7.	The graduating student delivers and/or manages the planned treatment in sequence and in accordance with accepted standards of care.	NO	NO	NA
8.	The graduating student promotes health maintenance and disease prevention.	YES	F	WRITTEN
9.	The graduating student applies the principles of infection control and environmental safety.	YES	F	WRITTEN
10.	The graduating student makes professional decisions affecting the practice of dentistry based on values that satisfy legal and ethical principles and service to society.	NO	NO	NA
11.	The graduating student performs routine self evaluation.	NO	NO	NA
12.	The graduating student applies business and practice management skills.	NO	NO	NA
13.	The graduating student demonstrates interpersonal skills to function successfully in a multicultural work environment.	NO	NO	NA
14.	The graduate critically evaluates the validity of new information, new products, and/or techniques and their relevance to the practice of dentistry.	YES	F	WRITTEN

Course Policies:

If you are late for class please wait for a pause in the lecture to take a seat, also turn off all cellular phones and audible pagers during lecture. As per School policy **you may not eat or drink**, except water, in the classrooms.

Student evaluation will be based two section examinations and a final partially comprehensive examination. Scores on examinations will be reported as number correct on exam with a projected final grade posted after each examination based on current completed examination scores. The final grades for the course will be determined by converting grades to a Z-score and the Z-score will be used to determine the percentage

grade for the course. The percentage will be calculated by adding 80% to the product of the student's average Z-score times 10%. If an examination's average grade is above 80% the examination average will be used in the calculation, no adjustment downward will be made for that examination.

Examinations total will account for 88%, 22% for each examination, of the final course grade with the remaining 12% based on class participation as recorded through the PRS units.

Following the first examination and each subsequent examination, as noted above, the Blackboard site will contain an estimate of your current letter grade standing without the participation portion.

Examinations will be composed of true/false, multiple choice, "multiple-multiple choice", and/or short answer questions. **Questions will be drawn from the assigned readings and the lecture material.**

Missed examinations may be made up if the absence was for good and sufficient reason. Format and timing of the make up exam will depend on the length of time after the original exam date that the make up is taken. Examinations will **not be returned** students may review their examination during office hours, formal and informal, until the next exam is given.

All examinations are less than two hours and you are not allowed to leave the room before you have finished your examination. During examinations all books, bags, papers, and electronic devices, except PRS if used for the examination, will be placed at the sides of the room unless otherwise instructed. All electronic devices must be turned off. Should you have a documented medical condition which may necessitate leaving during the examination, inform the course director at least **two days prior** to the examination so that arrangements may be made. No questions will be answered during examinations. All other policies not mentioned here but appearing in the University of Detroit Mercy School of Dentistry Academic Policies Handbook apply, where applicable, to this course. When taking on-line quizzes or examinations please note that the University of Detroit Mercy School of Dentistry Academic Policies Handbook states that "Failure to acknowledge assistance that a student received from a fellow student ... will be regarded as an instance of plagiarism."

Textbooks and Resource Materials:
Required Text:
Medical Biochemitry by Baynes, JW and Dominiczak, MH Second edition, Elshevier Mosby, 2005.

Readings:
Page listings are from the required text; the notation NCBI refers to the National Center for Biotechnology Information Bookshelf (http://www.ncbi.nlm.nih.gov). For many topics this semester *The Cell - A Molecular Approach* by Cooper, Geoffrey M.; Sunderland (MA): Sinauer Associates, Inc. ; c2000 and *Molecular Biology of the Cell* by Alberts, Bruce; Johnson, Alexander; Lewis, Julian; Raff, Martin; Roberts, Keith; Walter, Peter; New York and London: Garland Science ; c2002 on the site will be the most appropriate.

Another good source for general topics is *THE Medical Biochemistry Page* at:
http://web.indstate.edu/thcme/mwking/home.html

Evaluation and Grading:

Grading Scale

Percent	Letter	Percent	Letter
94 - 100	A	77 - 79	C+
90 - 93	A-	73 - 76	C
87 - 89	B+	70 - 72	C-
83 - 86	B	60 - 69	D
80 - 82	B-	0 - 59	F

Course Grade Components

Examination 1	30%
Examination 2	30%
Examination 3	30%
Participation	10%

Course Evaluation Methods:
Student evaluation will be based two section examinations and a final partially comprehensive examination (Examination 3 composed of 40 questions from new material and 10 questions from previous material). Scores on examinations will be reported on the web site as simply the number correct. For each examination the percentage score will be determined by converting the examination grade to a Z-score, the percentage for the exam will be calculated by adding 80% to the product of the student's Z-score times 10% or the standard deviation for the exam which ever is less. If the class average on an examination is above 80% no adjustment will be made to the scores. Examinations will constitute 90% of the final grade.

The use of the PRS will be account for 10% of the final grade. Each lecture period will be assigned participation points. Failure to bring the PRS clicker to class, having dead batteries, or not logging in will be interpreted as a lack of preparation for the lecture and result in ZERO participation points for the lecture.

The percentage grade for the course will be determined by the following formula:

(% examination score)*0.90 + (% participation score)*0.10 = Final % grade

Final letter grades will then be reported based on the scale published in the Academic Policies Handbook reproduced above.

Following the first examination and each subsequent examination the Blackboard site will contain an estimate of your current letter grade standing without the participation score. This estimate assumes that the examinations constitute 100% of the final grade and **will not include** participation grade.

Course Schedule:
Assigned readings are expected to have been completed prior to the lecture for which they are assigned.

Date	Time	Topic	Pages
Thr 1/17	10:00 - 11:50	DNA structure and metabolism	425-436; NCBI
Mon 1/21	9:00 - 9:50	**No Class, holiday**	
Thr 1/24	10:00 - 11:50	RNA synthesis	437 - 445
Mon 1/28	9:00 - 9:50	RNA synthesis and gene regulation	
Thr 1/31	10:00- 11:50	Gene regulation and rearrangement	459-471
Mon 2/4	9:00 - 9:50	Protein synthesis and control of protein synthesis	447-458
Thr 2/7	10:00- 11:50	Control of protein synthesis	
Mon 2/11	9:00 - 9:50	Protein targeting; Golgi system	
Thr 2/14	10:00 - 11:50	Post-translation modification of proteins	359-374
Mon 2/18	9:00 - 9:50	Collagen and connective tissue	387-390
Thr 2/21	10:00- 11:50	Membrane and extracellular matrix	390-398;77-92
Mon 2/25	9:00 - 9:50	**First Examination** (through Post-translation modification of proteins)	
Thr 2/28	10:00- 11:50	Hemoglobin/Iron metabolism/Oxygen transport	36-49; 403-412
Mon 3/3	9:00 - 9:50	Oxygen transport /Blood coagulation	63-76
Thr 3/6	10:00 - 11:50	Blood chemistry	25-34
Mon 3/10	9:00 - 9:50	Muscle biochemistry	261-272
Thr 3/13	10:00- 11:50	Receptors	421-445; 456-466
Mon 3/17	9:00 - 9:50	Receptors/Neurotransmitters	569-582
Thr 3/20	10:00- 11:50	Peptide hormones	
Mon 3/24	9:00 - 9:50	Peptide hormones	
Thr 3/27	10:00- 11:50	Growth factors	583-594
Mon 3/31	9:00 - 9:50	**No class - Spring break**	
Thr 4/3	10:00- 11:50	**No class - Spring break**	
Mon 4/7	9:00 - 9:50	**Second Examination** (through Growth Factors)	
Thr 4/10	10:00- 11:50	Cell cycle	
Mon 4/14	9:00 - 9:50	Oncogenes and cancer	
Thr 4/17	10:00- 11:50	Oncogenes and cancer	
Mon 4/21	9:00 - 9:50	Mechanism of mineralization	345-358

Date	Time	Topic	Pages
Thr 4/24	10:00- 11:50	Saliva and digestion	
Mon 4/28	9:00 - 9:50	Diabetes; Metabolism	
Thr 5/1	10:00- 11:50	Metabolism	
Final Examination to be scheduled			