

**Senior Seminar
BIOL 4132**

Fall 2015
Friday 1:00-1:50
336 DLSB

Instructor: Steven Vik
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Course Description

This will be a presentation and discussion course. Students will choose classic papers from the origins of molecular biology. They will be posted on [Blackboard](#) (shown below). We will discuss the scientists involved, the background of the research situation at that time, the experiments that were done, and the influence and impact on the development of science. Students assigned to “Introduction” will need to do a little research on the biographical background of the scientists. Students assigned to “Experimental” should prepare a powerpoint of the figures and tables of the research articles. Students assigned to “Influence” should do a citation analysis of the original paper to see how it was cited in the years after it was published, to determine how influential the paper was. Students will write a short paper and be prepared to discuss it on the last day of class.

Student Learning Outcomes:

Upon successful completion of this class, students will be able to:

1. Understand and explain classical research papers in molecular biology
2. Carry out literature research, including citation analysis
3. Make an oral presentation to peers based upon their readings and research

Grading:

The course grades will be determined according to presentations, participation in discussions, and the final paper. Attendance is required. For excused absences, efforts should be made to accommodate the presentation schedule by trading assignments. Unexcused absences will result in a lower grade.

HONOR CODE: It is expected that students have read sections of the 2014-2015 University Bulletin (p.105-107, or <http://www.smu.edu/StudentAffairs/StudentLife/StudentHandbook/HonorCode>) concerning university regulations and academic honesty. In matters of homework, it is permitted to consult your classmates or others for assistance, but the work submitted must be your own.

Disability Accommodations: Students needing academic accommodations for a disability must first be registered with Disability Accommodations & Success Strategies (DASS) to verify the disability and to establish eligibility for accommodations. Students may call 214-768-1470 or visit <http://www.smu.edu/ALEC/DASS> to begin the process. Once registered, students should then schedule an appointment with the professor to make appropriate arrangements.

Religious Observance: Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.)

Excused Absences for University Extracurricular Activities: Students participating in an officially sanctioned, scheduled University extracurricular activity will be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Catalogue)

Tentative Schedule

Date				
Aug 28	Organizational			
Sept 4	Introduction	Avery		
Sept 11	Main paper	Avery		
Sept 18	Influence	Avery	Introduction	Chargaff
Sep 25	Main paper	Chargaff		
Oct 2	Influence	Chargaff	Introduction	Hershey-Chase
Oct 9	Main paper	Hershey-Chase		
Oct 16	Influence	Hershey-Chase	Introduction	Meselson-Stahl
Oct 23	Main paper	Meselson-Stahl		
Oct 30	Influence	Meselson-Stahl	Introduction	Kornberg
Nov 6	Main paper	Kornberg		
Nov 13	Influence	Kornberg	Introduction	Pauling-Ingram or Pardee-Jacob-Mond
Nov 20	Main paper			
Dec 4	Discussion			

Papers:

Avery

[Studies on the chemical nature of the substance inducing transformation of pneumococcal types](#)

Avery OT, Macleod CM, McCarty M.
J Exp Med. 1944 Feb 1;79(2):137-58.

Chargaff

[Chemical specificity of nucleic acids and mechanism of their enzymatic degradation.](#)

Chargaff E.

Experientia. 1950 Jun 15;6(6):201-9

Hershey

[Independent functions of viral protein and nucleic acid in growth of bacteriophage.](#)

Hershey AD, Chase M.

J Gen Physiol. **1952** May;36(1):39-56.

Meselson

[The replication of DNA in *Escherichia coli*.](#)

Meselson M, Stahl FW.

Proc Natl Acad Sci U S A. 1958 Jul 15;44(7):671-82.

Kornberg

[Enzymatic Synthesis Of Deoxyribonucleic Acid. V. Chemical Composition Of](#)

[Enzymatically Synthesized Deoxyribonucleic Acid](#) I. R. Lehman, Steven B.

Zimmerman, Julius Adler, Maurice J. Bessman, E. S. Simms, and Arthur Kornberg

PNAS 1958 44 (12) 1191-1196

Pardee, Jacob & Monod

[The genetic control and cytoplasmic expression of “Inducibility” in the synthesis of \$\beta\$ -galactosidase by *E. coli*](#) Pardee AB, Jacob F, Monod J

J Mol Biol. 1959 - 1 (2), 165-178

Pauling, Ingram

[Sickle cell anemia a molecular disease.](#)

Pauling L, Itano HA, et al.

Science. 1949 Nov 25;110(2865):543-8.

[A specific chemical difference between the globins of normal human and sickle-cell anaemia haemoglobin.](#)

Ingram VM.

Nature. 1956 Oct 13;178(4537):792-4.

[Gene mutations in human haemoglobin: the chemical difference between normal and sickle cell haemoglobin.](#)

Ingram VM.

Nature. 1957 Aug 17;180(4581):326-8.