

COURSE ORGANIZER:

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Focus of course: **Electrostatic Effects in Biomolecular Structures**

SCHEDULE AND LOCATION:

All scheduled class sessions will be in Room 260 - Wright-Rieman Building, Fridays at Noon

First class meeting: Friday, September 9, 2005

The course is being held in conjunction with an international meeting, which will be held in the Fiber Optics Auditorium on Thursday and Friday, November 10 and 11, 2005. All students in the Seminar Class are expected to attend the meeting.

GUIDELINES FOR STUDENT PRESENTATIONS:

Individual students will present one to two papers on the research of one of the invited speakers. The presentation is expected to include the following:

Introduction: Determine the specific goals of the paper and its importance to understanding the area of interest. You may have to read some background (reviews, lecture notes, *etc.*) to put the paper in perspective.

Background: Appreciate the scientific principles that set the stage for the piece of work.

- What information is necessary to understand the scientific question?
- What is the system used to study the question? Why?
- Why is this paper important - in relation to others on the subject?

Methods: Provide an overview of the technology used in the paper

- What are the pertinent techniques applied in the studies?
- What are the advantages to techniques employed?
- What alternative techniques could have been used?

Results: Recognize the information that distinguishes each paragraph from the others within the Results Section. Similarly, identify the major points emphasized by each figure. Be prepared to present each paragraph or figure as an independent argument. Also, be prepared to explain points, such as the following:

- What are the axes of graphs?
- Are all experiments performed with controls?
- Are there alternative interpretations of the data?

Discussion: Summarize the findings of the paper. Describe the logic and significance to the area of research. Distinguish between proof and speculation.

- Do the experiments support the stated goals and conclusions?
- What models are proposed on the basis of the findings?
- What are the new questions prompted by the findings?
- What is the next experiment? What is the expected outcome?
- What are the biological implications?

STUDENT PREPARATION AND PARTICIPATION: All students are expected to read the assigned material and to participate in presentations and discussions. Students are encouraged to ask questions of the presenters. The instructor will moderate and direct class discussions. Participation in discussion will be evaluated. Class information, including reading assignments, will be available on the Internet. Students are expected to check the website regularly throughout the semester for additional reading assignments and important information.

A listing of the presentations of invited speakers follows:

Speaker	Affiliation	Topic
Tigran V. Chalikian	Leslie Dan Faculty of Pharmacy University of Toronto	"Volumetric characterization of counterion hydration in the vicinity of polymeric nucleic acids"
Bernard D. Coleman	Rutgers, The State University of New Jersey Dept. of Mechanics and Materials Science	The influence of salt concentration on equilibrium configurations of circular DNA
David D. Dunlap	Emory University Department of Cell Biology	"Positively charged surfaces increase the flexibility of DNA"
Marcia O. Fenley	Florida State University Institute of Molecular Biophysics	"Revisiting the salt dependence of the protein-nucleic association process: the role of anionic protein residues"
Anand Jagota	Lehigh University Department of Chemical Engineering	"Electrostatics of DNA/carbon nanotube hybrids and their manipulation by external fields"
Gerald B. Koudelka	State University of New York at Buffalo Department of Biological Sciences	"Indirect readout of DNA sequence: role of monovalent cations in determining the stability and specificity of protein-DNA complexes"
Sanford H. Leuba	Department of Cell Biology & Physiology University of Pittsburgh School of Medicine	"Chromatin fiber and nucleosomal dynamics, one-at-a-time"
James Maher	Mayo Foundation	"How cells enhance DNA flexibility"
Gerald S. Manning	Rutgers, The State University of New Jersey	"Theory of the persistence length of DNA and possibly other polyelectrolytes."
Wilma K. Olson	Rutgers, The State University of New Jersey	"Electrostatic discrimination of DNA sequence by proteins"
Camille Ripoll	Laboratory AMMIS University of Rouen	"Is ion condensation a key process in cell signalling?"
Nancy C. Stellwagen	University of Iowa Department of Biochemistry	"Preferential counterion binding to DNA A-tracts"