

## 18.418: Topics in Computational Molecular Biology

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Covers current research topics in computational molecular biology. Recent research papers presented from leading conferences such as the SIGACT International Conference on Computational Molecular Biology (RECOMB). Topic areas include original research (both theoretical and experimental) in genomics, molecular sequence analysis, recognition of genes and regulatory elements, molecular evolution, protein structure, and combinatorial libraries and drug design. Recent research by course participants also covered.

**Prerequisites:** 18.417 or permission of instructor.

### Time & Location

Class Meeting Time: Mondays & Wednesdays, 11:30 am to 1 pm in The Applied Mathematics Conference Room Building 2, Room 338

Office Hours for Professor Berger: Wednesdays, 1 to 2pm in 2-373.

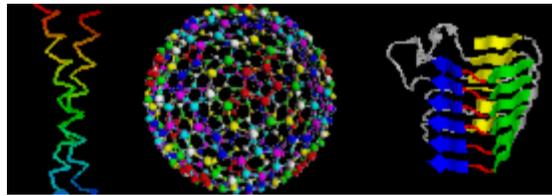
**URL:** <http://theory.lcs.mit.edu/~bab/class/04-18.418-home.html>

**Instructor:** Bonnie Berger

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**Course Support:** Kathleen Dickey

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### Schedule

Date	Lecturer	Topic
Feb 4	Bonnie Berger	Lecture: Introduction to the Course
Feb 9	Guest Lecturer: John Aach, Harvard	Multicellular genetic network modeling: directions and issues
Feb 11	Class Discussion	
Feb 16	Holiday (President's Day)	No Lecture
Feb 18	Class Discussion	
Feb 23	Guest Lecturer: Phil Bradley	Folding Algorithms for Protein Structure Prediction <i>*Note Special Time of 3.30pm, more information to follow.</i>
Feb 25	Class Discussion	
Mar 1	Peter Clote, Boston College	Efficiently computing the landscape of locally optimal RNA secondary structures
Mar 3	Class Discussion	
Mar 8	Class Discussion	
Mar 10	Guest Lecturer: Matt Menke, Berger Lab Member	Wrap-and-Pack: A New Paradigm for Beta Structural Motif Recognition with Application to Recognizing Beta Trefoils
Mar 15	Guest Lecturer: TBA	TBA
Mar 17	Guest Lecturer: Alex Coventry, Post-Doc, MIT- Berger Lab	Further recent work on MSARi, a program for detection of conserved RNA secondary structure in large multiple sequence alignments of orthologs.
Mar 22	Spring Vacation	No Lecture
Mar 25	Spring Vacation	No Lecture
Mar 29	Tandy Warnow, Department of Computer Sciences University of Texas at Austin	The CIPRES Project: Inferring the Tree of Life
Apr 1	RECOMB 2004	No Lecture
Apr 5	Guest Lecturer: Shamil Sunyaev, Harvard Medical School and Brigham and Women's Hospital	TBA
Apr 7	Class Discussion	
Apr 12	Guest Lecturer: Temple Smith, Boston University	TBA
Apr 15	Class Discussion	
Apr 19	Holiday (Patriot's Day)	No Lecture
Apr 21	Class Discussion	
Apr 26	Guest Lecturer: Zoltan Szallasi, Children's Hospital Boston	TBA
Apr 28	Class Discussion	
May 3	Guest Lecturer: Gary Benson	TBA
May 5	Class Discussion	
May 10	Qicheng Ma, Novartis	Clustering protein sequences with a novel metric transformed from sequence similarity scores and sequence alignments with neural networks