

Biomolecular NMR (MCB 5076)

Credit hours: 2

Classes: Thursday 2:00-3:15, Gentry Building Rm 201

<u>Month</u>	<u>Date</u>		<u>Lecture</u>	<u>Lecturer</u>
Aug	28	1	Overview of NMR in Biophysics	Gorbatyuk
Part I: NMR Basics				
Sep	4	2	Fundamentals of NMR (EM radiation, spin, coupling, NMR timescale)	Alexandrescu
	11	3	Sample considerations, NMR vs X-ray, other spectroscopies, isotopes	Alexandrescu
Part II: Multidimensional NMR experiments				
Sep	18***	4	NMR experiments (FID, semi-classical formalism, FT, 1D)	Alexandrescu
	25	5	2D-NMR spectroscopy (Fourier transforms, COSY, NOESY)	Alexandrescu
Oct	2	6	Multidimensional NMR experiments & sequential assignments	Alexandrescu
Part III: Structure Determination				
	9***	7	Structure determination I: algorithms & protocols	Alexandrescu
	16	8	Structure determination II: Refinement and measures of quality	Alexandrescu
Oct	23	9	Structure determination III: Advanced problems	Alexandrescu
Part V: Dynamics				
Oct	30***	10	Relaxation	Alexandrescu
Nov	6	11	Hydrogen exchange	Alexandrescu
Part V: Advanced applications				
Nov	13***	12	Shift mapping, Drug screening, complex docking, SAR by NMR	Stockman?
	20	13	Protein Folding / Amyloids	Alexandrescu
	27		Thanksgiving recess 11/23 – 11/29	
Dec	4***	14	Membrane proteins / Large complexes	Alexandrescu

NOTE : Dec 5 = Last day of classes

There will be a take home exam for the final (a report on an NMR paper from the scientific literature).

The Final exam will be handed out Nov 20 and is due by Tue Dec 9 at the latest.

Grading:

Quizzes ~ 40 pts.

Take home final ~ 60 pts

Total = 100 pts*

*Class participation will be considered for borderline grades.

*****Quizzes:**

Quiz 1 – NMR fundamentals (Sept 18)

Quiz 2 – Multi-dimensional NMR (Oct 9)

Quiz 3 – Structure determination (Oct 30)

Quiz 4 – Dynamics (Nov 13)

Quiz 5 – Advanced applications (Dec 4)

Instructor:

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Office hours:

Th 4-5 pm (after class)