

# GENOMICS, DEVELOPMENT and MEDICINE

BIO SCI D145, Course Code: 05570

Quarter: Winter Quarter 2018

Tu/Th 2-3:20 Steinhaus 134

Office Hours Tu/Th 3:30-5:00 or by appointment

Professor Bruce Blumberg ([Blumberg@uci.edu](mailto:Blumberg@uci.edu))

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Required text – **Genomes 4**, T. A. Brown. Garland Science Press, 2018 ISBN 978-0-8153-4508-4  
(but feel free not to buy this if you don't want as there will be nothing covered in exams that we do not discuss in class)

[Link to academic honesty policy](#)

<u>Date</u>	<u>Topic</u>	<u>Reading</u>
1/19	<b>1. Organization, structure and mapping of genomes</b> Model organisms, genome size and complexity, implications of split genes for functional diversity of proteins	1-86 203-217
1/11	<b>Presentation and discussion of week 1 papers</b>	Riann
1/16	<b>2. Genomic mapping continued, introduction to sequence analysis</b> Comparative genomics, synteny, genome evolution	155-179 429-460
1/18	<b>Presentation and discussion of week 2 papers</b>	Students
1/23	<b>3. Sequence methods and strategies</b> Automated sequencing, large scale genomic sequencing, nextgen sequencing	87-117
1/25	<b>Presentation and discussion of week 3 papers</b>	Students
1/30	<b>4. Sequencing and individual variation</b> Nextgen sequencing and intro to transcriptome analysis.	87-117 257-290
2/1/	<b>Presentation and discussion of week 4 papers, term paper outlines due (2/2 @ 24:00)</b>	Students
2/6	<b>5. In depth analysis of gene expression</b> Whole genome analysis of mRNA and protein expression,	257-290 135-138
2/8	<b>Midterm examination</b>	<b>Weeks 1-5</b>
2/13	<b>6. Identification of gene function</b> Genome annotation, functional analysis, introduction to chromatin	146-154
2/15	<b>Presentation and discussion of week 6 papers</b>	Students
2/20	<b>7. Introduction to gene networks and epigenetic analysis</b> Chromatin immunoprecipitation, DNA and protein methylation analysis	219-256
2/22	<b>Presentation and discussion of week 7 papers</b>	Students
2/27	<b>8. Comprehensive mutant libraries</b> High throughput gene knockout, gene targeting, gene trapping, genome-wide mutagenesis	139-145 Class notes and papers
3/1	<b>Presentation and discussion of week 8 papers</b>	Students
3/6	<b>9. The proteome and mapping protein interactions</b> Methods – two hybrid, mass spectrometry, global profiling.	293-306, Class papers
3/8	<b>Presentation and discussion of week 9 papers – TERM PAPERS DUE (3/9 @ 24:00)</b>	Students
3/13	<b>10. Introduction to metabolomics and the importance of the microbiome</b> Metagenomics and impact of the microbiome on other aspects of physiology	322-328 Class papers
3/15	<b>Presentation and discussion of week 10 papers</b>	Students
3/22	<b>Final examination – (covers only weeks 6-10)</b>	1:30 - 3:30

**Grading criteria: Midterm (35%), Paper (10%), Presentation (10%), Class participation (10%), Final exam (35%)**