

BISC 436: Human Genetics (Spring 2019) revised 2/25/19

Tu/Th 11 am-12:15 pm

Shoe 408

Professor

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Office Hours: by appointment

<u>Date</u>	<u>Topic</u>
Jan 22	Introduction to Human Genetics Draw for book report dates. <i>Find a current news article about human genetics and the associated primary research paper (post your choice on BB)</i>
Jan 24	How does genetic testing affect us? <i>Discuss articles posted on BB. (Post your book choice on BB)</i>
Jan 29	Team presentations and discussion: news articles and associated papers <i>(8 min presentation per team; post your presentations on BB)</i>
Jan 31	Team presentations and discussion: news articles and associated papers
Feb 5	Team presentations and discussion: news articles and associated papers Book Reports #1-2
Feb 7	Book Reports #3-9: Living with Human Diseases and Disorders <i>(4 min presentation each + discussion)</i>
Feb 12	Book Reports #10-16
Feb 14	Book Reports #17-22
Feb 19	Book Reports #23-26 History of Eugenics in the US: <i>Discuss articles posted on BB</i>
Feb 21	Ethics of Gene Editing/Eugenics: Should we try to ‘fix’ human diseases?
Feb 26	Review: Genetic Code, Pedigree Analysis, Meiosis
Feb 28	Inheritance of Complex Traits
Mar 5	Cytogenetics: Karyotypes and Chromosome Aberrations
Mar 7	Midterm

<u>Date</u>	<u>Topic</u>
Mar 19*	Introduction to Group Research Projects Draw for group presentation dates Choose disorder or disease/Group Research
Mar 21*	From Proteins to Phenotypes/Group Research
Mar 26	Group Presentations: Preliminary Findings (5 min presentation/group + discussion)
Mar 28*	Mutations and Epigenetics/Group Research
Apr 2*	Genes and Cancer/Group Research
Apr 4	Genetic counseling
Apr 9*	Biotechnology and Society/Group Research
Apr 11*	Genomes and Genomics/Group Research
Apr 16	Group Presentations: The Big Show (30 min presentation/group + discussion)
Apr 18	Group Presentations
Apr 23	Group Presentations
Apr 25	Group Presentations
Apr 30	Reproductive Technology
May 2	Gene Therapy/Review for Final
May 7	Final Exam Tuesday NOON

Syllabus revisions will be posted on Blackboard.

Course Description: This course is designed to allow Biology majors and students planning careers in medical/scientific fields to explore the ongoing revolution in our understanding of human genetics and the ability to uncover human disease and variability through genetic testing. Students will review the basics of molecular genetics, learn about genetic counseling, discuss ethical issues of genetic testing and treatment, and carry out research projects in small groups on human diseases such as cystic fibrosis, breast cancer, sickle cell anemia, and Huntington's disease.

Laptop Requirement: Please bring your laptop for the indicated class periods (*) to do research online with your group. On presentation days, you will need to be able to access it online on the classroom desktop.

Book Reports: Please pick one of the following books for your report about living with a disease/disorder, and post your choice on Blackboard. Books not on the list may also be selected with pre-approval. If the same book is selected by more than one person, the earlier choice will have precedence.

Looking up the book descriptions on amazon.com is a quick way to find out more about the titles that interest you. Books marked with an asterisk are available at the Oxford Public Library (free!). Your oral report should be concise (4 minutes maximum)--*What insights did you gain from reading your book?* A word-processed version of your report is due during the same class period (4 double-spaced pages maximum). Both components of your report will be graded.

Alexander, Rebecca. *Not Fade Away: A Memoir of Senses Lost and Found*

Beck, Martha. *Expecting Adam: A True Story of Birth, Rebirth and Everyday Magic**

Biderman, Beverly. *Wired for Sound: A Journey into Hearing*

Cohen, Richard. *Blindsided: Lifting a Life Above Illness: A Reluctant Memoir**

Deford, Frank. *Alex: The Life of a Child*

Detrich, Terry & Detrich, Don. *The Spirit of Lo: An Ordinary Family's Extraordinary Journey*

DiDonato, Tiffanie. *Dwarf: a Memoir.*

Estress, Jenifer & Couric, Katie. *Tales from the Bed: On Living, Dying, and Having It All*

Gable, Mona. *Blood Brother: The gene that rocked my family*

Gironimi, Jay. *Can't Eat, Can't Breathe and other ways Cystic Fibrosis has F#\$%*d me*

Grandin, Temple. *Thinking in Pictures: And Other Reports from My Life with Autism**

Grandin, Temple. *The Autistic Brain: Helping Different Kinds of Minds Succeed**

Grandin, Temple. *The way I see it: a personal look at autism & Asperger's**

Hampton, Kelle. *Bloom: Finding Beauty in the Unexpected—A Memoir*

Heyman, Carly & Conley, Stephanie. *My Extra Special Brother*

Higashida, Naoki. *The Reason I Jump: the Inner Voice of a 13-year-old boy with autism**

Hirsch, James. *Cheating Destiny: Living with Diabetes**

Hull, John. *Touching the Rock: An Experience of Blindness*

Karlen, Richard. *Devil's Dance*

Kennedy, Dan. *Little People: Learning to See the World Through My Daughter's Eyes*

Kingsley, Jason & Levitz, Mitchell. *Count Us in: Growing Up With Down Syndrome*

Kisor, Henry. *What's That Pig Outdoors: A Memoir of Deafness**

Lesh, Margaret. *Let Me Get This Off my Chest: A Breast Cancer Survivor Over-shares*

Nash, Jennie. *The Victoria's Secret Catalog Never Stops Coming: And Other Lessons I Learned From Breast Cancer**

Petrick, Ben. *40,000 to One*

Preves, Sharon. *Intersex and Identity: the Contested Self*

Prince-Hughes, Dawn. *Songs of the Gorilla Nation: My Journey Through Autism**

Richardson, John H. *In the Little World: A True Story of Dwarfs, Love, and Trouble**

Rogers, Cindi. *Becoming Mrs. Rogers: Learning to Live the Fragile X Way*

Rothenberg, Laura. *Breathing for a Living: A Memoir**

Seligman, Adam Ward. *Don't Think about Monkeys. Extraordinary Stories written by people with Tourette syndrome.*

Silver, Ann. *One Way, Deaf Way.*

Sinton, William. *I Choose to Live: A Journey through Life with ALS*
 Simmons, Philip. *Learning to Fall: The Blessings of an Imperfect Life**(library e-book)
 Smoak, Shelby. *Bleeder: A Memoir**
 Spradley, Thomas & Spradley, James. *Deaf like Me.*
 Stallings, Gene & Cook, Sally. *Another Season: A Coach's Story of Raising an Exceptional Son*
 Tolchin, Charlie. *Blow the House Down: The Story of My Double Lung Transplant*
 Walker, Lou Ann. *A Loss for Words: The Story of Deafness in a Family*
 Warner, Delores. *Don't Buy Too Many Green Bananas: Living with ALS*
 Weihenmayer, Erik. *Touch the Top of the World: A Blind Man's Journey to Climb Farther Than the Eye Can See**
 Weiner, Jonathan. *His Brother's Keeper: A Story from the Edge of Medicine*
 Wexler, Alice. *Mapping Fate: A Memoir of Family, Risk, and Genetic Research*
 Wexler, Alice. *The Woman Who Walked into the Sea: Huntington's and the Making of a Genetic Disease.*
 Williams, Montel & Grobel, Lawrence. *Climbing Higher**
 Wolfson, Penny. *Moonrise: One Family, Genetic Identity, and Muscular Dystrophy*
 Zimmermann, Susan. *Grief Dancers: A Journey into the Depths of the Soul*
 Zimmermann, Susan. *Keeping Katherine: A Mother's Journey to Acceptance**(library e-book)
 Zuckoff, Mitchell. *Choosing Naia: A Family's Journey**

Group Projects: As part of this course, you will be working with other students in teams of 3 (which I will assign). As a group, you will select a disorder/disease to research during the semester from the following list. Alternatively, your group may come up with your own topic with my approval. As the molecular basis of the disorder/disease selected will be part of your presentation, information about altered gene function should be available for any disorder/disease selected which is not on the list. Please let me know your choice by 3/21 (or earlier). If a disorder/disease is selected by more than one group, the earliest choice will have precedence.

Osteogenesis imperfecta	Achondroplasia
Hemochromatosis	Down syndrome
Duchenne Muscular Dystrophy	Familial Adenomatous Polyposis
Celiac disease	Sickle cell anemia
Breast cancer (BRCA1 or BRCA2)	Cystic fibrosis
Huntington's disease	Marfan's syndrome
Neurofibromatosis	Tay-sach's disease
Hearing loss (Connexin26)	Noonan syndrome
Bloom syndrome	Fragile X syndrome
Rett syndrome	

Grades: Group projects: News article (15%), The Big Show (25%). Individual presentations: Book Report (20%). Discussion participation (10%). Exams (30%): Midterm (15%), Final (15%). **To comply with attendance verification requirements, a report of your attendance will be made on Jan 29.** Points will be deducted from your participation grade for any unexcused absences during the semester.

Exams will have a multiple choice/fill-in-the-blank/short answer format and will be based on the material we cover in class, including the news articles about genetics and diseases/disorders presented as individual and group projects. Late individual or group

presentations will automatically receive half credit. The plus/minus grading system will be used with standard cutoffs. ie. 94-100% = A, 90-93 = A-, 87-89% = B+, 84-86 = B.

Useful websites

<http://www.genetests.org/>

<http://www.geneticalliance.org/>

<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=OMIM>

Examples of (older) news articles about human genetics

***http://www.salon.com/2014/03/23/hitlers_favorite_american_biological_fascism_in_the_shadow_of_new_york_city/ (everyone, please read for discussion on eugenics)

http://www.slate.com/blogs/future_tense/2015/01/07/23andme_has_a_60_million_contract_deal_with_genentech_to_provide_data_for.html

http://www.slate.com/blogs/wild_things/2014/08/25/human_pheromones_the_lack_of_a_jacobson_s_or_vomerinasal_organ_doesn_t_keep.html

<http://www.bbc.com/news/health-30742774>

<http://www.nytimes.com/2014/08/17/opinion/sunday/cancer-and-the-secrets-of-your-genes.html>

http://www.cnn.com/2014/03/08/us/mississippi-unmarked-graves/index.html?hpt=hp_t2

http://www.slate.com/articles/health_and_science/new_scientist/2014/08/dna_donors_for_the_resilience_project_carriers_of_inherited_diseases_could.html

<http://www.reuters.com/article/2014/07/29/us-healthcare-23andme-idUSKBN0FY2IM20140729>

http://www.slate.com/blogs/xx_factor/2014/06/18/jesse_lee_herald_agrees_to_a_vasectomy_as_part_of_his_plea_deal_bad_idea.html

http://www.nytimes.com/2014/03/06/health/study-gives-hope-of-altering-genes-to-repel-hiv.html?_r=0

<http://www.sciencedaily.com/releases/2014/07/140730043402.htm>

<http://www.nytimes.com/2014/03/18/science/shoukhrat-mitalipovs-mitochondrial-manipulations.html?hpw&rref=science>

http://www.nytimes.com/2014/06/29/magazine/the-brave-new-world-of-three-parent-ivf.html?_r=0

<http://www.telegraph.co.uk/news/worldnews/asia/tibet/11044316/Tibetans-developed-genetic-mutation-to-help-them-survive-on-roof-of-the-world.html>