**Independent Study: Epigenetics**

Instructor: Christopher Chabot, Boyd 210, X 5-2864, chrisc@plymouth.edu

BI 5910, Time – Weekly Meeting; Place - Boyd 117/101

Book: Kovalchuk, I., & Kovalchuk, O. (2012). *Epigenetics in health and disease*. Upper Saddle River, NJ: FT Press.

Supplemental Text: Hallgrímsson, Benedikt, and Brian Keith Hall. *Epigenetics: Linking Genotype and Phenotype in Development and Evolution*. Berkeley: University of California, 2011. Print.

Readings: Weekly

Course Description: Learning outcomes for this independent study are to comprehend the key epigenetic mechanisms and how these are applicable to inheritance and the development of organisms. Next, we would aim to understand how epigenetics is applied to health and disease as well as evolution, behavior, and ecology as individual organisms interact within their environments. Specific learning objectives include the role of non-coding RNAs, the interaction of alleles, how genes are silenced, epigenetic memory, ect. Lastly, we would like to understand the application of this knowledge for future cures and technologies in modern health and disease research and treatment.

9/5 - Week 1: Historical Perspective (Chapter 1) Chris

9/16 - Week 2: Chromatin Dynamics/ Remodeling in Animals/Plants (Chapters 2) Chris

9/23 - Week 3: DNA Methylation as Epigentic Mechanism (Chapter 4) Christopher

9/30 - Week 4: Histone Modification in Epigenetic Regulation (Chapter 5) Ashely

10/7 - Week 5: Non-coding RNAs (bacteria + humans) (Chapter 6) Ashley

10/14 – Week 6: Non-coding RNAs in Epigenetics (Chapter 7) \*\*\*Columbus Day\*\*\*

10/21 - Week 7: Non-coding RNAs across kingdoms- Animals (Chapter 10)

10/28 - Week 8: Paramutation, Transactivation, Transvection, and Cosuppression (Chapter 13)

11/4 - Week 9: Bacterial Adaptive Immunity (Chapter 14) Ashley

11/11 - Week 10: Gene Silencing (Chapters 15) Chrisopher \*\*\*Veterans Day\*\*\*

11/18 - Week 11: Epigenetics in Health and Disease- Cancer (Chapter 17) Christopher

11/25 - Week 12: Epigenetics in Health and Disease- Behavioral Neuroscience (Chapter 18) Chris

12/2 - Week 13: The Role of Epigenetics in Nervous System Development- Hallgrímsson, Benedikt, and Brian Keith Hall (Chapter 9) Chris

12/9 – Week 14: Epigenetics in Health and Disease- Diet, Toxicology, and Environmental Exposures (Chapter 19) Christopher

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**Evaluation and Logistics:** Discussion based notes, questions, and topics should be prepared prior to each meeting time. Completion of the reading and preparation of thoughtful discussions for each scheduled meeting ( as indicated by the syllabus) are required.