

NSC 1001.01 The Epigenetics Era: What new Discoveries in Epigenetics Tell us about the Interface of Genes and Environment

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W 3:10-4:25pm (ten weekly 75-min. sessions: 1/11-3/22)

Course Description

For centuries, philosophers and scientists alike have contemplated whether, and to what extent, nature and nurture contribute to our development and ultimately, to whom we become. Are we just the sum of our genes, simply the product of our environments, or both? In this seminar we will address these questions and many others through the lens of epigenetics, a recently-established scientific field that examines the interactions of our genes with the effects of our environment(s).

Through investigations into these processes, researchers and clinicians are now beginning to piece together how diet, exercise, stress, chemical exposures, and even our day-to-day experiences can influence which of our genes are turned “on” or “off”, with clear implications for the areas of cancer, diabetes, obesity, neuropsychiatric disorders and many others. Also, because these epigenetic “changes” are potentially reversible (unlike genetic mutations), they hold the promise of one day enabling the design of treatments using food or drugs to reverse some of these detrimental alterations to our genomes and epigenomes.

Please join us as we explore this fascinating topic using a combination of out-of-class readings, in-class discussions and group presentations. Students will come away from this commons seminar with a basic understanding of epigenetics and why this research area has expanded exponentially in recent years, impacting nearly every area of biomedicine and its related basic science disciplines.

Evaluation

30% Attendance and participation
20% Group presentations
50% Reading-related writing assignments

Required Reading

Nessa Carey, *The Epigenetics Revolution: How Modern Biology Is Rewriting Our Understanding of Genetics, Disease, and Inheritance*

Plus additional readings from Michael Bess, *Our Grandchildren Redesigned: Life in the Bioengineered Society of the Near Future* (2015, Beacon Press) and

David Sweatt, *Epigenetic Regulation in the Nervous System* (2014, Elsevier/Academic Press)