THE WAGNER FREE INSTITUTE OF SCIENCE

Winter 2019
CHEMISTRY SERIES
Stimulating Molecules: The Biochemistry of Euphoria
Professor Joseph B. Rucker

The course meets at the **Independence Branch of the Free Library,** located at 18 S. 7th Street (between Chestnut and Market Streets), Philadelphia.

Dates: 6 Wednesdays, January 23 to February 27, 2019
Time: Lectures are held from 6:15 to 7:45 PM

No pre-registration required. Please register by filling out a registration form at the class.

Course Description

Every day, many of us mess with our brains. We drink coffee to wake up, we smoke cigarettes as a break, we eat spicy food to please our palates, and we have a drink to unwind at the end of the day. This course will be a biochemist's view of how these common substances affect the human nervous system. Each week will focus on a substance, where it comes from, and how it acts at the molecular and cellular level.

Course Schedule

1. Wednesday, January 23, 2019 – This is Your Brain on Molecules
Course introduction; molecules, small and large; neurons and neurotransmitters.

2. Wednesday, January 30, 2019 – Capsaicin: Some Like It Hot!
A brief history of chile peppers; capsaicin and the capsaicin receptor; how we feel heat and pain; capsaicin in the natural world.

3. Wednesday, February 6, 2018 – Caffeine: Your Morning Joe
Coffee, tea, or yaupon? Adenosine receptors and why we get tired; the ups and downs of caffeine.

4. Wednesday, February 13, 2019 – Nicotine: Taking A Break
A puff of smoke; acetylcholine and acetylcholine receptors; moods and addiction; nicotine and pesticides.

5. Wednesday, February 20, 2019 – Ethanol: The Enigmatic Drink
A brief digression on over-ripe fruit; alcohol metabolism; what does ethanol actually do and why do we like it?

6. Wednesday, February 27, 2019 – Learning from Nature
How do you start thinking about treating a disease? What does a biotech company look like?

Wednesday, March 6, 2019 – make-up class (if needed)

Recommended Readings

There is no textbook or required reading for this course. The following general resources can be used as optional supplements to the course for people who wish to learn more.

1. Wenk, Gary L. *Your Brain on Food, 2nd Edition*. New York: Oxford University Press, 2015. This book covers many of the same topics we are covering, although from a somewhat different perspective. It is also an accessible introduction to neuroscience.

2. Any good undergraduate biochemistry textbook (even one that is old) can provide deeper insight into many of the topics discussed in this course. Three faculty members at Oregon State University (Kevin Ahern, Indira Rajagopal, and Taralyn Tan) have produced two free online undergraduate textbooks of biochemistry, available in a variety of formats (PDF, Kindle, and iPad). Files can be downloaded at http://biochem.science.oregonstate.edu/content/biochemistry-free-and-easy

About the Professor

Dr. Joseph B. Rucker is the vice-president of research and development and a co-founder of Integral Molecular, a biotech company in West Philadelphia. His scientific expertise focuses on membrane proteins, sensory receptors, viruses, and antibodies. He is an author on more than 30 publications and has published in journals including Cell, Science, and Nature. He received his Ph.D. in chemistry from the University of California, Berkeley and did post-doctoral work at the University of Pennsylvania. He joined the Wagner's faculty in 2015.

The course is presented by the Wagner Free Institute of Science. Founded in 1855, the Wagner is dedicated to providing free science education. All classes are free and open to the public. To attend, please complete a registration form at the class. For more information about the Wagner Free Institute of Science and its programs, please visit www.wagnerfreeinstitute.org or call 215-763-6529.