

# THE WAGNER FREE INSTITUTE OF SCIENCE

Spring 2018  
BIOLOGICAL SCIENCES SERIES  
**Sex in the Wild: Strategies of Sexual Reproduction in the Animal Kingdom**  
Professor Patrick Slavin

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, March 28 to May 9, 2018. Class meets from 6:15 to 7:30 PM

## Course Description

The course explores the myriad ways that animal evolution has devised to reproduce sexually from meiosis to fertilization. Topics include the advantages of sexual reproduction, determination of gender, hermaphroditic organisms, mating systems and mate selection and some modes of sexual reproduction unique in the animal kingdom. The animal kingdom has many bizarre and amazing ways to assure their genes are represented in the next generation.

## Course Schedule

### **1. Wednesday, March 28, 2018 – Asexual Reproduction**

Asexual reproduction in animals including fragmentation, budding, parthenogenesis. Aphids can give birth to their daughters and granddaughters at the same time. Meiosis and the production of eggs and sperm. Why sex is better than no sex.

### **2. Wednesday, April 4, 2018 – Gender Determination**

Genetic determinants (XY and WZ systems, haplodiploidy) and environmental determinants of gender (such as crocodiles and turtles whose sex depends on the temperature at which the eggs are incubated).

### **3. Wednesday, April 11, 2018 – Hermaphroditic Animals**

Simultaneous hermaphrodites: some flatworms fight over who will be the father and who the mother. Sequential hermaphrodites: oysters usually begin life as males but change to females – and may change back again. How some animals, like the sea squirt, avoid selfing (self-fertilization).

NO CLASS – Wednesday, April 18, 2018

### **4. Wednesday, April 25, 2018 – Mating Systems**

Obligate and facultative monogamy. The meadow vole mates for life – as long as certain hormone levels are high enough. This class will also explore polygyny, polyandry and promiscuity.

### **5. Wednesday, May 2, 2018 – Mate Selection**

Why do some female birds select males with the biggest tail feathers? Territoriality. Leks and courtship displays. Other pre-mating behaviors.

### **6. Wednesday, May 9, 2018 – Post-copulatory Behaviors**

Some unique sexual systems: Polychaete worms grow appendages that do the mating for them. Some salamanders only produce females but must mate with males of closely related species. Gynogenesis in fish, androgenesis in clams. Some animals have more than one kind of male.

Wednesday, May 23, 2018 – Make-up class (if needed)

### **Recommended Readings**

No textbook is required. The following readings are suggested:

Venton, D. 2013. Highlight: On the Origin of the Sexes.  
[www.ncbi.nlm.nih.gov/pmc/articles/PMC4292172](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4292172)

Scharer, L., et al. 2015. Sexual Conflict in Hermaphrodites.  
[www.ncbi.nlm.nih.gov/pmc/articles/PMC4292171](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4292171)

Jones, A. G. and N. L. Ratterman. 2009. Mate Choice and Sexual Selection: What Have We Learned since Darwin? [www.pnas.org/content/106/Supplement\\_1/10001](http://www.pnas.org/content/106/Supplement_1/10001)

Krasnec, M. O., et al. 2012. Mating Systems in Sexual Animals.  
[www.nature.com/scitable/knowledge/library/mating-systems-in-sexual-animals-83033427](http://www.nature.com/scitable/knowledge/library/mating-systems-in-sexual-animals-83033427)

Dastagir, S., et al. 1997. Evolution of Leks.  
[www.nyu.edu/projects/fitch/resources/student\\_papers/dastagir.pdf](http://www.nyu.edu/projects/fitch/resources/student_papers/dastagir.pdf)

Tinbergen, N. 1957. The functions of territory.  
<https://doi.org/10.1080/00063655709475864>

**Dr. Patrick Slavin** received his doctorate in Ecology from Rutgers University. He has worked in public health and agriculture. As an academic he taught biology at Rowan College at Burlington County and continues to teach there as an adjunct professor. He served as the ecologist on the New Jersey State Pesticide Control Board and the New Jersey Pinelands Council.

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