1 Introduction

Welcome to *Evolution of Development* (aka *Evo-Devo*).

1.1 Brief Description

The aim of this course will be to study:

- how developmental mechanisms are shaped during evolution
- how developmental processes influence evolution

The course will draw from, among others, the following fields: cell, developmental and evolutionary biology; comparative embryology and morphology; molecular, population and quantitative genetics; genomics; life-history evolution; experimental evolution; paleontology; theoretical and computational biology; phylogenetics; ecology.

1.2 Schedule

Duration August 23 – December 1, 2004 (29 lectures)

Times Mon/Wed, 10:00 – 11:30 AM

Location E312-D3

Note: the lecture scheduled for 09/15 will be replaced by a seminar on the same day by Prof. Günter Wagner (4:00 – 5:00 PM, 102 HSC).

1.3 Contact Details

Office Dept. Biology & Biochemistry, 350 Science & Research Bldg. 2

Office hours Tue/Fri, 10:00 – 11:00 AM (or by appointment)

Email razevedo@uh.edu

Telephone 713-743-4149

1.4 Materials

1.4.1 Reading

There is no single reference text for this course. Instead, at each lecture I will distribute lecture notes like the ones you are reading now, and will assign required and recommended reading materials for the following lecture. However, everyone will benefit from consulting the following textbooks throughout the course:

1. Arthur, W. *The origin of animal body plans: a study in evolutionary developmental biology* (Cambridge University Press, Cambridge, UK, 1997).

2. Carroll, S. B., Grenier, J. K. & Weatherbee, S. D. *From DNA to diversity: molecular genetics and the evolution of animal design* (Blackwell Science, Malden, MA, 2001).

3. Davidson, E. H. *Genomic regulatory systems: development and evolution* (Academic Press, San Diego, 2001).

4. Gerhart, J. & Kirschner, M. *Cells, embryos, and evolution: toward a cellular and developmental understanding of phenotypic variation and evolutionary adaptability* (Blackwell Science, Malden, Mass., 1997).

5. Gilbert, S. F. *Developmental biology* 7th edn. (Sinauer Associates, Sunderland, MA, 2003).

6. Minelli, A. *The development of animal form: ontogeny, morphology, and evolution* (Cambridge University Press, Cambridge, UK, 2003).

7. Raff, R. A. *The shape of life: genes, development, and the evolution of animal form* (University of Chicago Press, Chicago, 1996).

8. West-Eberhard, M. J. *Developmental plasticity and evolution* (Oxford University Press, New York, 2003).

9. Wilkins, A. S. *The evolution of developmental pathways* (Sinauer Associates, Sunderland, MA, 2002).

1.4.2 Website

Lecture notes, slides and required reading materials will either be made available for download at the website listed in the footer or distributed in lectures. Other course-related information will be added continuously to the website, so check it regularly for updates.

1.5 Grading System

1.5.1 Exams

Evaluation will consist of 5 in-term tests, held during the regular class period. The provisional dates for these tests are: 09/13, 10/4, 10/25, 11/15 and 12/1. The tests will last 45 min, and will contain a mixture of multiple-choice and short-answer questions covering any topics discussed in class or included in the required reading materials. The final grade (100%) will be the mean of the 4 best test scores. There will be no other exam.

1.5.2 Participation

I expect full attendance throughout the course. Participation will be monitored using attendance sheets. The number of classes missed, above 4 "free" absences, will be deducted as percentage points from the final grade (attending less than 45 min of a class will count as half a point).

1.6 Next Lecture

In the next lecture I will give a brief overview of evolutionary developmental biology. The required paper is Raff (2000).