

Genetics/MB&B/MCDB 425/625a

First set of readings

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Readings for the discussions:

We have given you three papers to read that all describe the same experiment. We are using this work as an illustrative example to teach you how to think about genetic screens. The third reading is optional.

I. Mutations affecting segment number and polarity in *Drosophila* (*Nature*, 1980)

Christiane Nüsslein-Volhard and Eric Wieschaus

This paper summarizes the most interesting results and implications of a genetic screen for *Drosophila* mutants with defects in embryonic development. This *Nature* paper describes the work only in outline form, and was meant to be understood by a general scientific readership with little specialized knowledge of genetics. It therefore serves as a good introduction.

We have added technical footnotes to help you read the paper (see the "technical notes" handout on the web site).

II. Mutations affecting the pattern of the larval cuticle in *Drosophila melanogaster* (*Roux's archives*, 1984)

C. Nüsslein-Volhard, E. Wieschaus, and H. Kluding

This paper describes the same work as the first reading, but goes into all the technical details of the experiments. This second reading restricts its discussion to technical issues of the experiments rather than describing (as the *Nature* paper does) the implications of the results for understanding developmental biology. ***You need to read both papers to really understand the work.***

Read this second paper carefully prior to our discussion, which is entirely devoted to a discussion of both this paper and the first reading listed above. Again, we have added technical footnotes to help you slog through all of the specialized techniques. During the discussion section you can expect to be called on to describe and analyze particular experiments, figures, techniques, and conclusions from the papers. Discussion section is not meant to be a test - it is a format to allow us to learn from each other by having an interesting discussion of the papers.

You should prepare a summary of this paper (max 1 page). It is due at the beginning of the discussion section.

III. From molecular patterns to morphogenesis: the lessons from *Drosophila* (*Nobel lecture*)

Eric Wieschaus

An optional reading. This is the Nobel lecture by Eric Wieschaus (a former Yale graduate student) describing in fairly non-technical terms some of the interesting intellectual aspects of the same work from the first two readings. You may find this reading helps you more fully understand and critically analyze the work.