PřF:Bi5614en Genetics in animal model organisms 2024

Lecture 1 *Drosophila* genetics

- **Genetics** on the **Fly**: A Primer on the *Drosophila* Model System
- KG Hales, CA Korey, AM Larracuente, DM Roberts - **Genetics**, 2015 - academic.oup.com
- Read first half of this. Also history and glossary at the end
- The **joy** of **balancers**
- DE Miller, KR Cook, RS Hawley - PLoS genetics, 2019 - journals.plos.org
- Short. Read all of it
- How to Design a Genetic Mating Scheme: A Basic Training Package for *Drosophila* Genetics
- St Johnston, Daniel. "The art and design of genetic screens: Drosophila melanogaster." *Nature reviews genetics* 3.3 (2002): 176-188.

Lecture 2. *Drosophila* genetic screens for mutants affecting embryonic pattern formation

- St Johnston, Daniel. "The art and design of genetic screens: Drosophila melanogaster." *Nature reviews genetics* 3.3 (2002): 176-188.Heidelberg screen, Wieschaus and Nusslein Vollhard
- Wieschaus, Eric, and Christiane Nüsslein-Volhard. "The Heidelberg screen for pattern mutants of Drosophila: a personal account." *Annual Review of Cell and Developmental Biology* 32.1 (2016): 1-46.
- Scott Gilbert textbook chapter of Drosophila

Lecture 3. *Drosophila* maternal effect mutants; formation of eggs, AP and DV axis, homeotic mutants and vertebrate conservations,

- St Johnston, Daniel. "The art and design of genetic screens: Drosophila melanogaster." *Nature reviews genetics* 3.3 (2002): 176-188.

- Wieschaus, Eric, and Christiane Nüsslein-Volhard. "The Heidelberg screen for pattern mutants of Drosophila: a personal account." *Annual Review of Cell and Developmental Biology* 32.1 (2016): 1-46.
- Kimble, Judith, and Christiane Nüsslein-Volhard. "The great small organisms of developmental genetics: Caenorhabditis elegans and Drosophila melanogaster." *Developmental biology* 485 (2022): 93-122.

Lecture 4. *Drosophila* transgenesis, GAL4/UAS and somatic recombination to generate clones of mutant cells, germline clones and germline development

- The **art** and **design** of genetic screens: ***Drosophila*** *melanogaster*
- D St Johnston - Nature reviews genetics, 2002 - nature.com
- **[PDF]** Creating mosaics in **Drosophila**
- N Perrimon - International Journal of Developmental …, 1998 - genepath.med.harvard.edu
- **[PDF]** GAL4 system in ***drosophila***: A fly geneticist's **swiss army knife**
- JB Duffy - genesis, 2002 - fenix.ciencias.ulisboa.pt

Lecture 5 *Drosophila* nervous system development, embryonic and larval neurogenesis

- The **art** and **design** of genetic screens: ***Drosophila*** *melanogaster*
- D St Johnston - Nature reviews genetics, 2002 - nature.com
- ***Drosophila*** Embryonic CNS Development: **Neurogenesis**, Gliogenesis, Cell Fate, and Differentiation
- ST **Crews** - Genetics, 2019 - academic.oup.com

Lecture 6. *Drosophila* temporal specification in neurogenesis, larval CNS development, ecdysone

Doe, Chris Q. "Temporal patterning in the Drosophila CNS." *Annual review of cell and developmental biology* 33.1 (2017): 219-240.

Truman, James W., and Lynn M. Riddiford. "Drosophila postembryonic nervous system development: a model for the endocrine control of development." *Genetics* 223.3 (2023): iyac184.

Lecture 8 *Drosophila* vision and movement

(Lecture 7 Powerpoint file is missing and was never prepared. The file uploaded as Lect 7 is actually Lect 6 with audio)

Currier, Timothy A., Michelle M. Pang, and Thomas R. Clandinin. "Visual processing in the fly, from photoreceptors to behavior." *Genetics* 224.2 (2023): iyad064.

Lecture 9 *Drosophila* Olfaction, learning and memory

Montell, Craig. "Drosophila sensory receptors—a set of molecular Swiss Army Knives." *Genetics* 217.1 (2021): 1-34.

Davis, Ronald L. "Learning and memory using Drosophila melanogaster: a focus on advances made in the fifth decade of research." *Genetics* 224.4 (2023): iyad085.

Lecture 10 *Drosophila* Learning and memory, Internal states, Circadian rythms and sleep

Modi, Mehrab N., Yichun Shuai, and Glenn C. Turner. "The Drosophila mushroom body: from architecture to algorithm in a learning circuit." *Annual review of neuroscience* 43.1 (2020): 465-484.

Dubowy, Christine, and Amita Sehgal. "Circadian rhythms and sleep in Drosophila melanogaster." *Genetics* 205.4 (2017): 1373-1397.

Lecture 11 *C. elegans* genetic screens, microRNAs, RNAi and

Corsi, Ann K., Bruce Wightman, and Martin Chalfie. "A transparent window into biology: a primer on Caenorhabditis elegans." *Genetics* 200.2 (2015): 387-407.

Kimble, Judith, and Christiane Nüsslein-Volhard. "The great small organisms of developmental genetics: Caenorhabditis elegans and Drosophila melanogaster." *Developmental biology* 485 (2022): 93-122.

Jorgensen, Erik M., and Susan E. Mango. "The art and design of genetic screens: Caenorhabditis elegans." *Nature Reviews Genetics* 3.5 (2002): 356-369.

Lecture 12 Vertebrate genetic screens. Zebrafish and mice.

Holtzman, Nathalia G., et al. "Learning to fish with genetics: a primer on the vertebrate model Danio rerio." *Genetics* 203.3 (2016): 1069-1089.

Patton, E. Elizabeth, and Leonard I. Zon. "The art and design of genetic screens: zebrafish." *Nature Reviews Genetics* 2.12 (2001): 956-966.