

[Home & search](#) / [Search](#) / [Stockholm University Drosophila Development Site and Facility](#)

Stockholm University Drosophila Development Site and Facility

Type

Core facility, Specific technique

Host organisation

[Department of Developmental Biology \(Wenner-Gren Institute\)](#)

We can assist studies of gene function in high throughput gene inactivation experiments in cell lines and through the generation transgenic *Drosophila melanogaster* strains.

Facility website: <http://www.wgi.su.se/research/research-groups/christos-samakovlis>

Interest in collaboration with industry: Yes

Description

The Stockholm University Drosophila Site establishes inducible cellular GFP assays for high throughput gene inactivation via RNAi transfections. It also generates transgenic fly strains for tissue specific expression of tagged forms of any protein, as well as fly strains for conditional gene inactivation via RNAi.

Functional genomics is a dynamic field that is currently shifting from a descriptive period focused on gene identification and expression to a phase addressing the most fundamental question in biology: gene function. Biomedical research is critically dependent on the ability to test gene function in suitable model organisms by examining the phenotypes of mutations. During the last century the fly has been the favourite organism for genetic studies in higher eukaryotes. A large collection of available mutants affecting approximately 25% of the predicted genes is available from public stock centres.

P-element transposon based methods allow the creation of genetically defined, stable lines with regulated transgenes and efficient production of genetic mosaics, techniques not available in other animals including *C. elegans*. Recent comparative genome sequence studies reveal that 2/3 of the human genes that have been implicated in disease have clear orthologs in flies. In addition, the similarities in the molecular control of several developmental and physiological responses have recently enabled the use of *Drosophila* as a model system for the identification and validation of therapeutic agents for human disorders. Wallenberg Consortium North (WCN) has financed the setup of *Drosophila* technology

platforms at Stockholm and Umeå Universities.

The SU facility was initiated in October 2001 and is currently providing two sorts of services:

1. Establishment of inducible cellular GFP assays for high throughput gene inactivation via RNAi transfections.
1. Generation of transgenic fly strains for tissue specific expression of GFP or epitope tagged forms of any protein. Generation of fly strains for conditional gene inactivation of Drosophila genes via RNAi.

Researchers with relevant competence can use our resources, while full service can be provided to those who desire.

Infrastructure/methods

The facility houses both Drosophila cell line cultures and Drosophila mutant strains. The facility mainly performs two sorts of services:

1. *High throughput RNAi gene inactivations in cell lines*

This arm of the facility is dedicated in establishing inducible assays in Drosophila and potentially other insect cell-lines to carry out large scale gene inactivation experiments using standard double stranded RNAi technology in cells and examine gene function using fluorescent assays.

The facility has generated vectors carrying GFP in different open reading frames relatively to the cloning cassette, which is located downstream of the metallothionein promoter. Expression of the fusion protein can thus be induced by the addition of metals into the medium. The system has been tested with four different constructs addressing nucleocytoplasmic protein localization. (NLS-GFP, NES-GFP, GFP and Dorsal GFP) All proteins are inducible and localized to the correct compartment. Two of the 30 Drosophila nucleoporin homologues have been inactivated (as tested by antibodies against the endogenous proteins). Thus the system is ready for large scale experiments.

2. *Transgenic fly facility*

This part of the facility aims to generate stable transformant strains that allow the conditional, tissue-specific expression of genes from any species in flies for phenotypic analysis. The facility also offers help for the generation of RNAi strains for inactivation of endogenous genes.

The facility has generated 4 new UAS vectors that allow the conditional expression of epitope or GFP tagged version of any protein. Injections have been initiated in May 2002 and deliver 300 injected larvae per week and construct, resulting to 2-5 transformant strains per construct. The facility maintains more than 20 GAL4 driver strains that allow the expression of the tagged transgenic gene products in any tissue or developmental stage of interest.

Practical information

If the demand is higher than the availability, then research groups within

the Stockholm region are prioritised, but all academic groups are always welcome to contact us.

External collaborators must fund the running costs of the experiments. The cost of the RNAi experiments depends on the particular cellular phenotype that you wish to study, and the number of genes that you wish to inactivate. The cost generally varies between 500 and 2000 SEK/gene. In high throughput RNAi gene inactivation researchers must be willing and capable to provide double stranded RNA in sufficient quantities to inactivate the genes that they have selected. In the longer term, the system can be used for the identification of chemical inhibitors and their targets. RNAi inactivation of genes generally takes about one week to perform.

The running costs of the generation of transgenic flies mount from 3000-5000 SEK per injected construct. This typically results to 300 injected embryos giving rise to 3-5 transgenic strains per construct. Transgenic flies for analysis are usually available within three to four weeks.

Constructs are injected at the order they arrive.

Keywords

drosophila, RNAi, interference, GFP, transgenic, industryinterest

Categories

Genomics, Experimental models

Present in the following regions

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