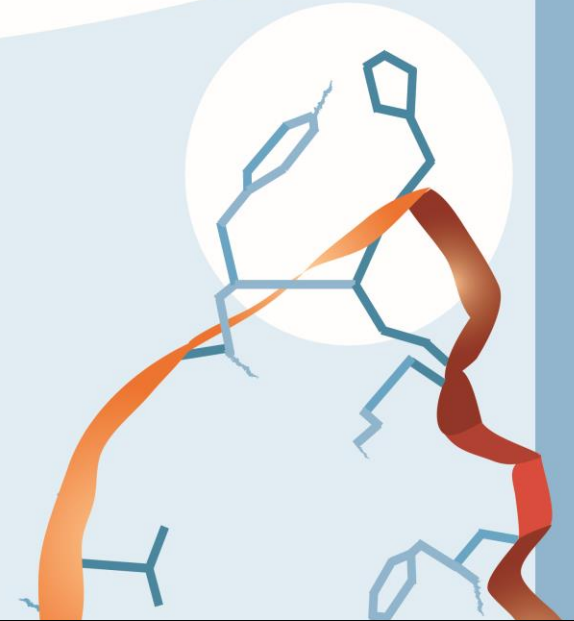


# Zouti Biyoloji STAR

Nouvo lojisyèl pou  
ansèyman biyoloji

**Alison Brauneis, Ph.D.**  
**Lourdes M. Alemán, Ph.D.**  
**Ruthly François**  
**Jimmy Fedna**

13-15 jen 2016





Zouti lojisyèl pou ansèyman  
& rechèch

## Objektif zouti STAR yo

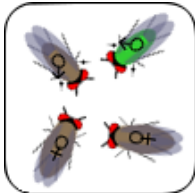
Sèvi ak lojisyèl entèraktif pou konekte **rechèch nan laboratwa & ansèyman nan klas.**

# Zouti Biyoloji STAR



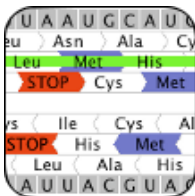
**StarBiochem:** viyzalizè molekil

Kou MIT: Entwodiksyon Biyoloji



**StarGenetics:** laboratwa jenetik vityèl

Kou MIT: Entwodiksyon biyoloji, Jenetik



**StarORF:** jwenn jèn yo

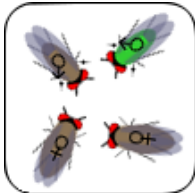
Kou MIT: Jenetik

# Zouti Biyoloji STAR



**StarBiochem:** viyzalizè molekil

Kou MIT: Entwodiksyon Biyoloji



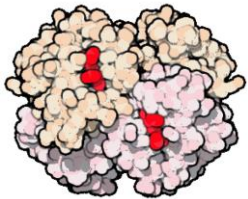
**StarBiochem:** yon vizyalizè molekil an 3-D

## Objektif pedagojik

Esplòre fòm ak estrikti molekil ki enpòtan nan bagay k ap viv



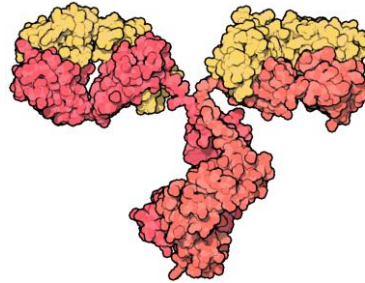
# Pwoteyin ranpli plizyè fonksyon biyolojik ki enpòtan



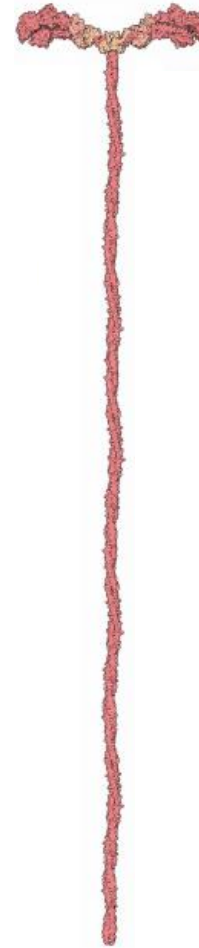
**emoglobin**  
pote oksijèn  
nan san



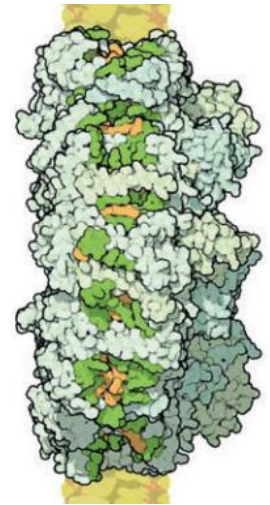
**F1 ATPase**  
jenere enèji



**antikò**  
Pwoteje kont  
enfeksyon



**myosin**  
Mouvman  
misk



**fotosistèm I**  
Fotosentèz

# Se estrikti pwoteyin lan ki detèmine fonksyon I

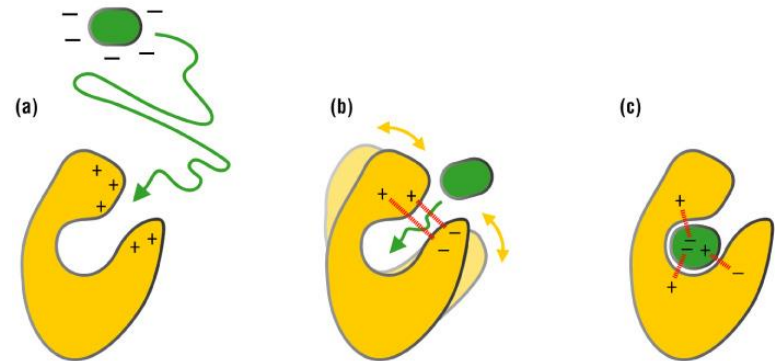
estrikti



fonksyon

# Metòd tradisyonèl pou anseye estrikti pwoteyin ak fonksyon li

Desen anime  
ka lakòz move entèpretasyon



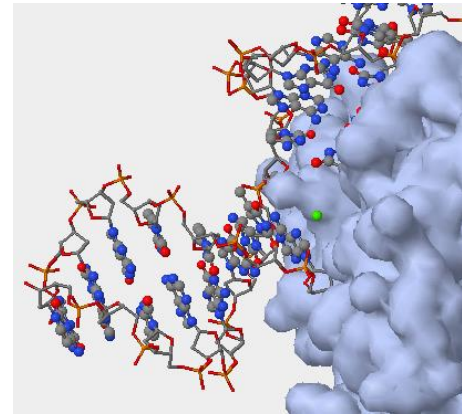
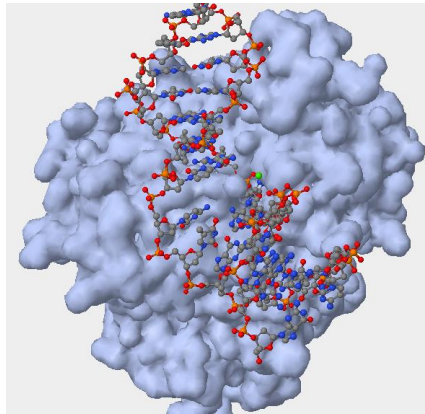
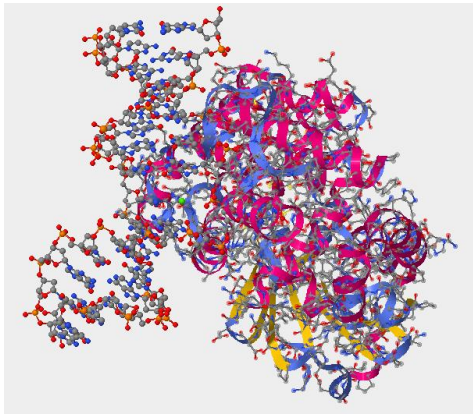
Represantasyon an 2 dimansyon  
limite sa etidyan an ka wè



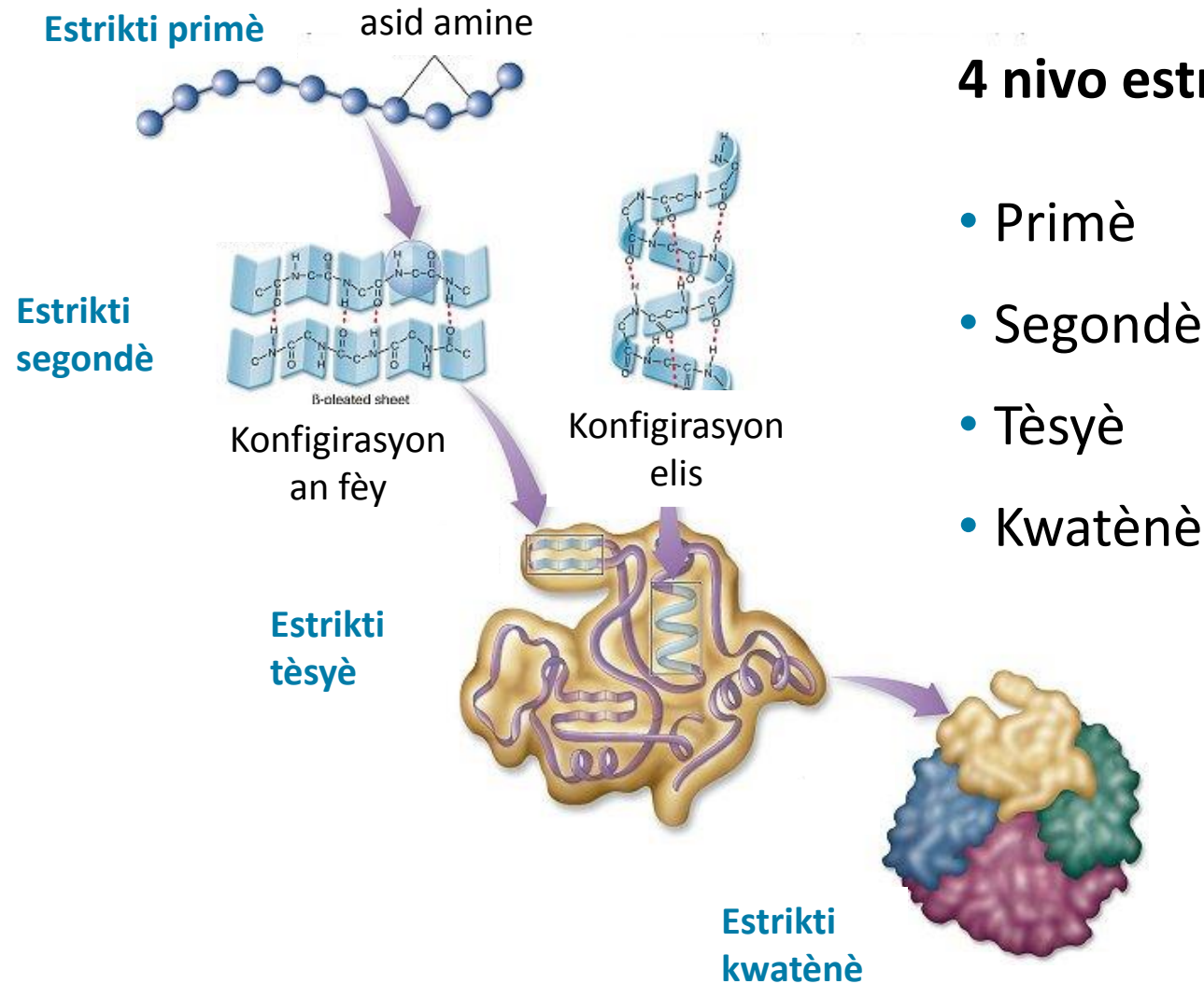


# StarBiochem se yon vizyalizè pwoteyin an 3-D ki devlope espesyalman pou ansèyman

- Sit entènèt: <http://star.mit.edu/biochem/>
- Platfòm endepandan (Windows, Mac, Unix/Linux)
- Entèfas la devlope nan lide pou ede etidyan an.
- Ka telechaje 105,732 estrikti ki soti nan sit “**Protein Data Bank**” (**Bank Done Pwoteyin**).
- Mache men-nan-men ak metòd ansèyman sou pwoteyin nan kou entwodiksyon biyoloji.



# Eleman de baz nan estrikti pwoteyin



4 nivo estrikti pwoteyin:

- Primè
- Segondè
- Tèsyè
- Kwatènè

# StarBiochem

Estrikti molekil ou jwenn ladan l:

## Pwoteyin

- Asid amine
- Anpil egzanp pwoteyin

## Sik

- Glikoz
- Friktoz
- Sikwoz
- Galaktoz

## Lipid (Grès)

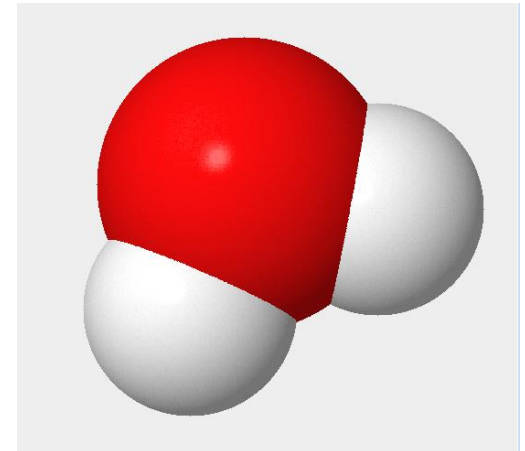
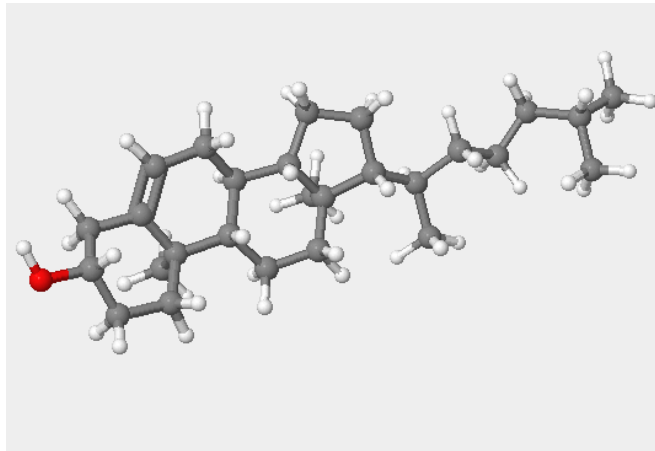
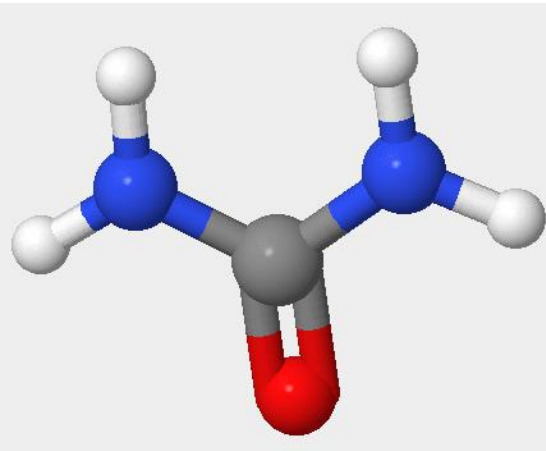
- Trigliserid
- Fosfolipid
- Lasi
- Estewoyid

## Asid nikleyik

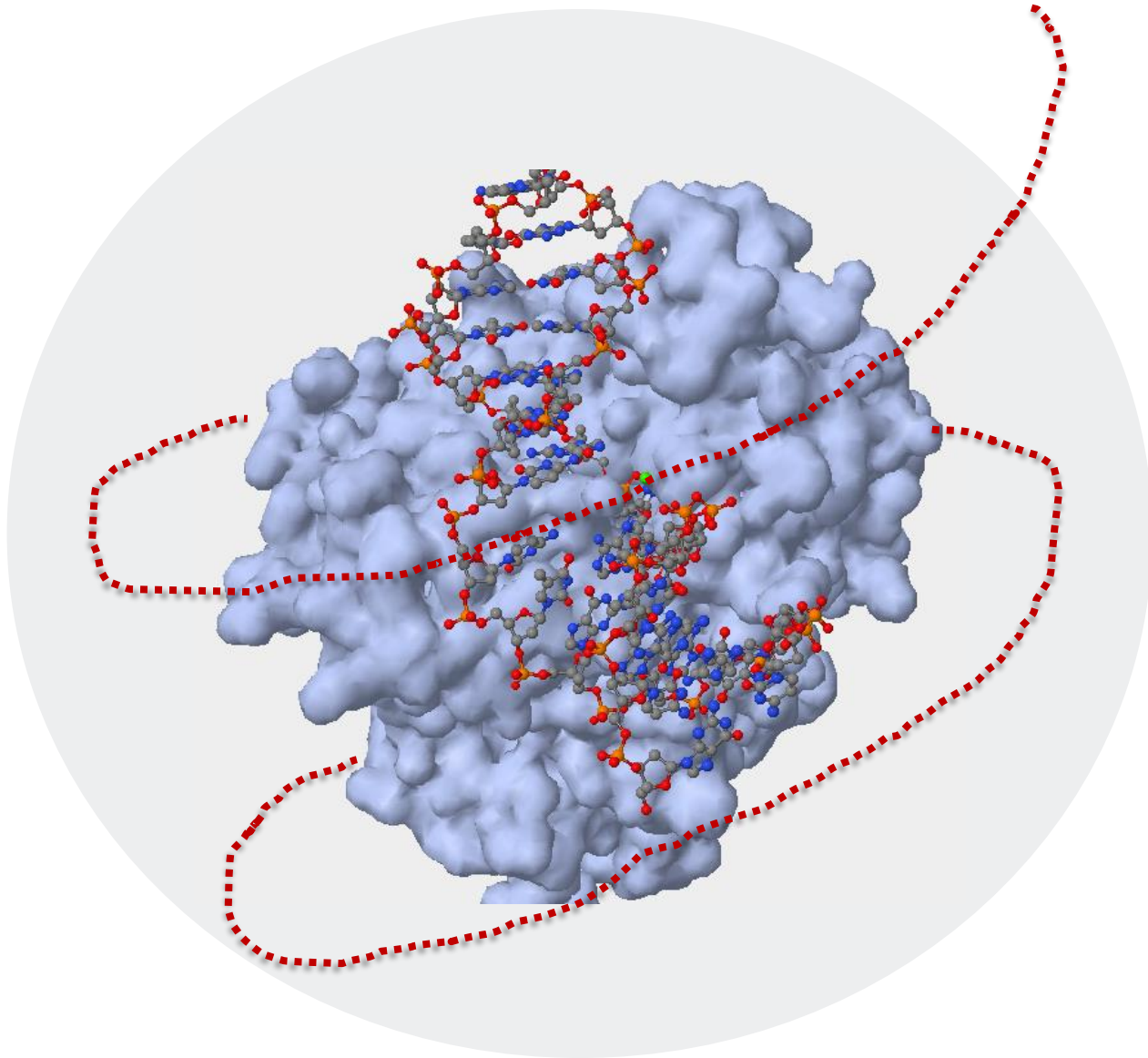
- Tout nikleyotid
- ADN
- ARN - mARN, tARN, rARN

## Lòt molekil

- Dlo
- Ire
- Asid sitrik
- Asid pirivik
- Asid laktik
- Alkòl etilik
- Gwoup fosfat



**Annou fè yon vizit!**



# http://star.mit.edu/biochem/

STAR: Biochem - Home

web.mit.edu/star/biochem/index.html

The Education Group STAR Websites Stellar Websites SurveyMonkey WebMoira TWC Somerville Weather Home MIT IS&T

StarBiochem

Home Biochem Genetics Orf Biogene Hydro Molsim Cluster Hpc

star > biochem > Home

## StarBiochem

*Note: This is the newly released StarBiochem Version 2.3. To access version 2.1 or earlier click on [Previous Versions](#).*

StarBiochem is a 3-D protein viewer that allows students to learn key concepts about the biology of proteins in an interactive manner.

Unlike traditional 3-D protein viewers which may require installation and significant technical expertise, StarBiochem is an intuitive 3-D protein viewer designed with students in mind. StarBiochem's user interface was designed to visually represent protein structural information based on the four different levels of protein structure, which mirrors how students get introduced to this topic in class and in textbooks.

## Using StarBiochem

StarBiochem is accessible via the web. Press the **START** button to get started.

**Start** StarBiochem Version 2.3 **Klike la a pou demare StarBiochem**

**Manual** Read StarBiochem documentation

**Feedback** Send Us Feedback

## Exercises

Sample exercises for StarBiochem, covering a range of concepts and difficulty, can be found in [Sample Exercise](#).

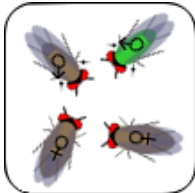
## StarBiochem in Action

# Zouti Biyoloji STAR



**StarBiochem:** viyzalizè molekil

Kou MIT: Entwodiksyon Biyoloji



**StarGenetics:** laboratwa jenetik vityèl

Kou MIT: Entwodiksyon biyoloji, Jenetik



**StarORF:** jwenn jèn yo

Kou MIT: Jenetik

# Metòd tradisyonèl pou anseye jenetik gen limit ...

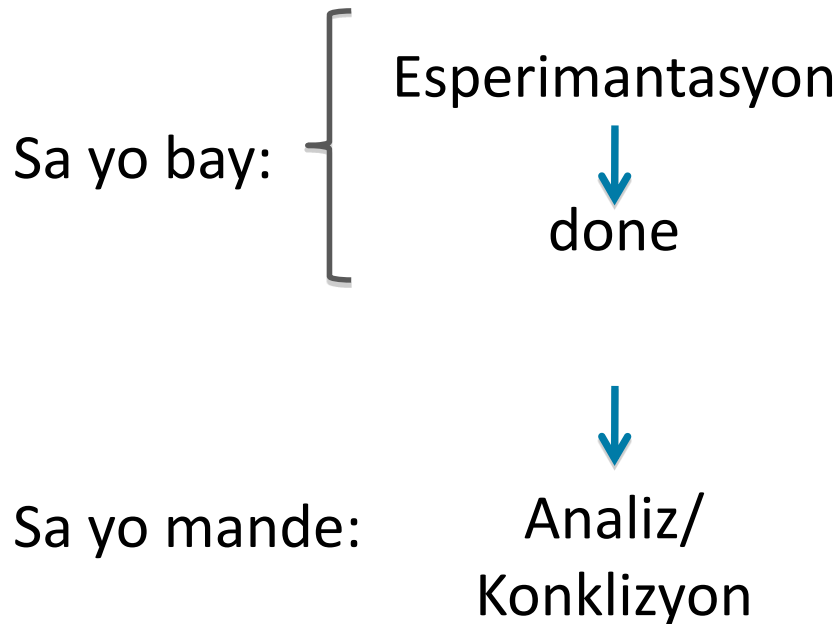
Pwoblèm ki genyen nan yon manyèl jenetik tipik:

Sa yo bay: { Esperimantasyon  
↓  
done

Sa yo mande: ↓  
Analiz/  
Konklizyon

# Metòd tradisyonèl pou anseye jenetik gen limit ...

Pwoblèm ki genyen nan yon manyèl jenetik tipik:



**Kisa ki manke?**

Sa pa pèmèt etidyan  
yo developpe pwòp  
ipotèz pa yo epi  
teste ipotèz sa yo!



# Anseye jenetik nan yon vre laboratwa se sitiyayon ideyal la. MEN, sa pa toujou posib...

## Lajan

Enstale laboratwa pou etidye mouch ka koute chè (\$10,000 - \$50,000).

## Tan

Esperimantasyon jenetik yo ka dire plis pase tan ki disponib pou anseye yon konsèp.

## Planifikasyon

Se pa tout kou jenetik ki ofri yon konpozant laboratwa.



**StarGenetics:** yon laboratwa jenetik vityèl

## **Objektif edikatif**

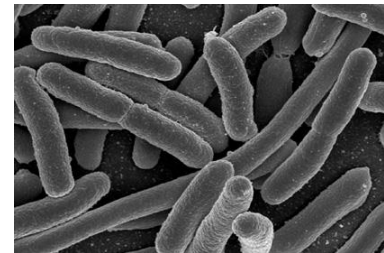
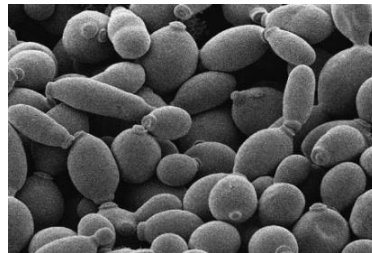
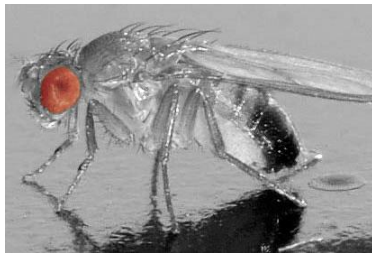
Anseye konsèp jenetik yo, montre planifikasyon yon  
esperimantasyon, montre rezonman lojik epi analiz.





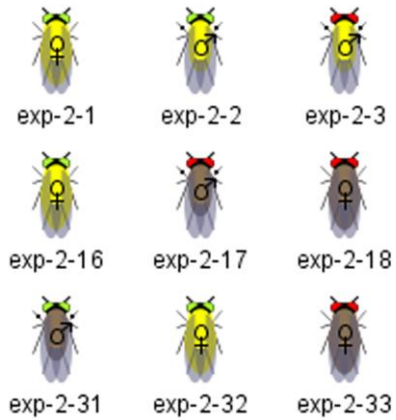
# StarGenetics ...

- Disponib sou entènèt: <http://web.mit.edu/star/genetics/>
- Mache ak nenpòt ki òdinatè (Windows, Mac, Unix/Linux)
- Fè kòm si se esperimantasyon nan laboratwa k ap fèt tout bon
- Gratis!
- Rapid!
- Ofri esperimantasyon sou fòm similasyon, selon objektif ou
- Gen anpil modèl òganis ki disponib...



# Òganis ki nan StarGenetics:

Ti mouch nan fwi



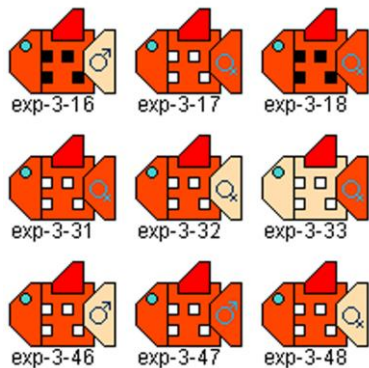
Pwa Mendel



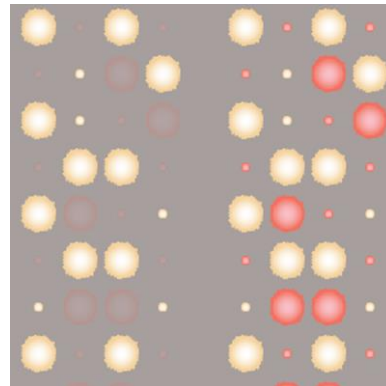
Bèf



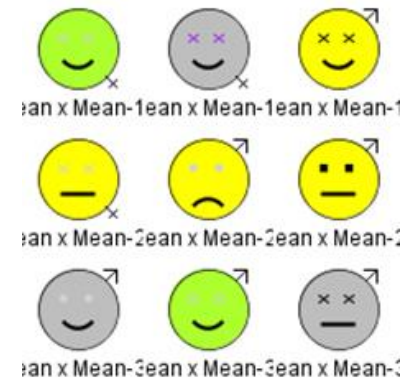
Pwason



Leven/Levi



Ti figi



# Ki konsèp ou ka anseye ak StarGenetics?

## konsèp jenetik



- jenotip → fenotip
- dominan v. resesif
- mòd ak estrateji transfè jenetik
- konplemantasyon
- jèn ki lye youn ak lòt
- yon fenotip → plizyè alèl
- yon mitasyon → plizyè fenotip
- epistazi
- wout/sekans regilasyon jenetik

## zouti jenetik



- kwazman jenetik  
(P/F1/F2; tèz kwazmam,  
kwazman envès; kwazman di-  
ibrid; kwazman resipwòk, eks.)
- analiz ki kare
- Echikye Punnett

# Karakteristik ki kapab defini nan StarGenetics

## Karakteristik òganis

- # desandan pa kwazman
- # akoupleman pa òganis
- to rekonbinezon

## Jenotip ak fenotip ki koresponn youn ak lòt

- fenotip vizib ak fenotip ki “pa vizib”

## Pozisyon jèn ak entèraksyon pami jèn

- lyezon
- relasyon epistatik

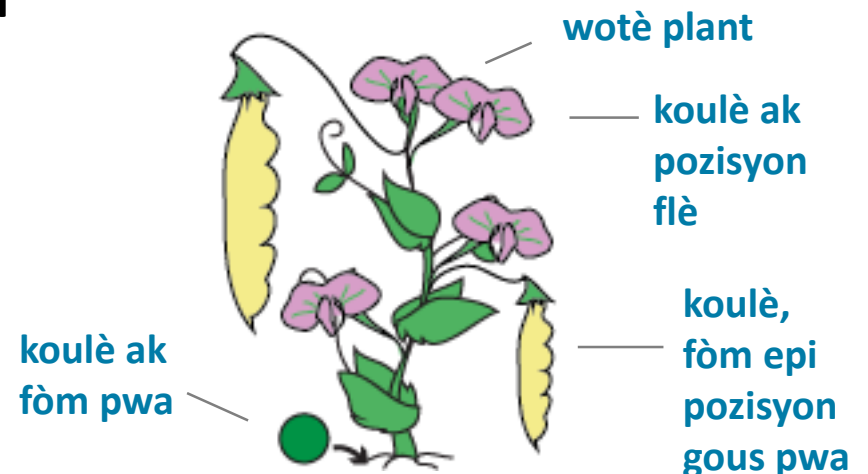
## Òganis

- sèks
- jenotip

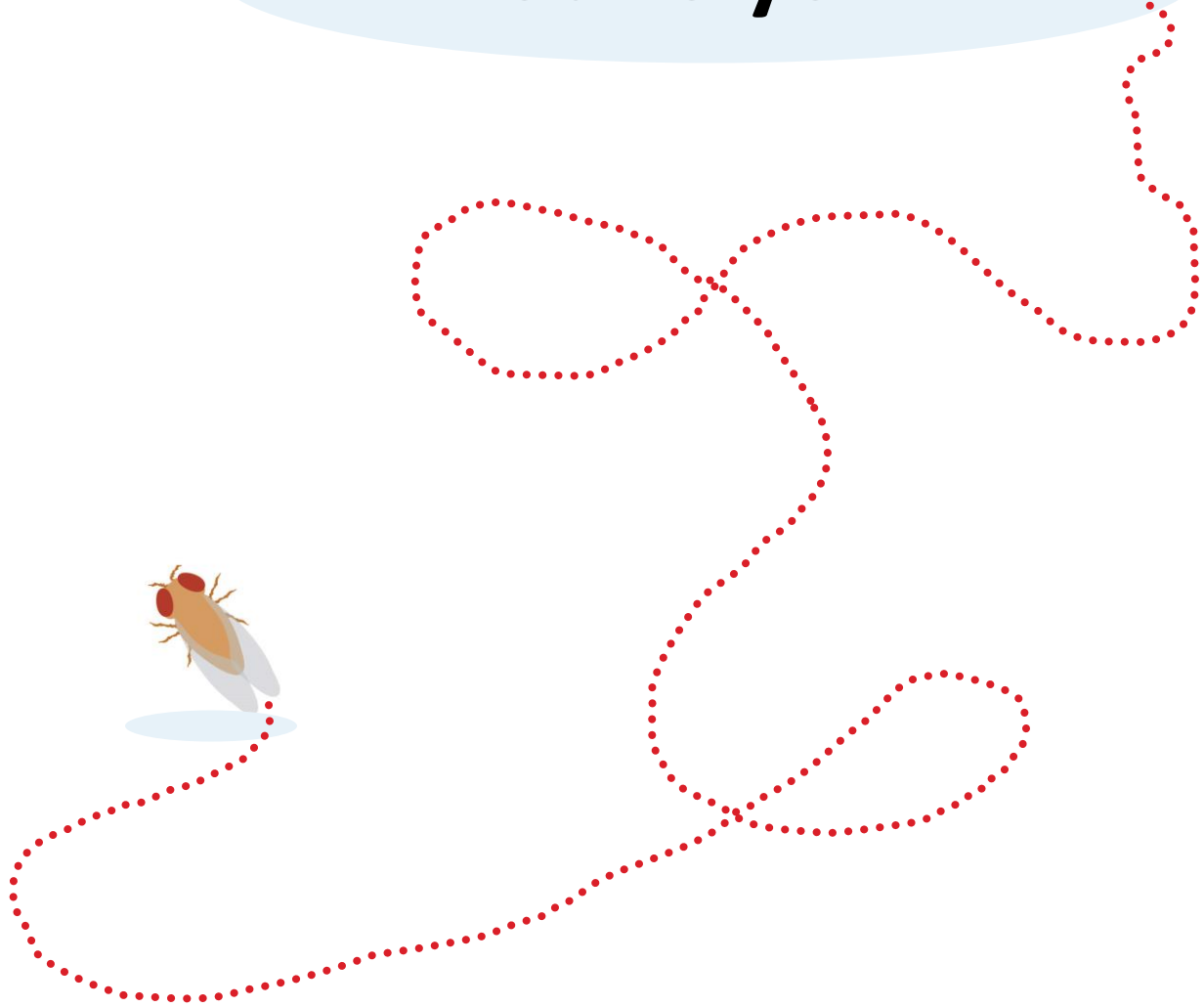
## Ti mouch nan fwi



## Pwa Mendel



**An nou fè yon vizit!**



# http://star.mit.edu/genetics/

STAR: Genetics - Home

web.mit.edu/star/genetics/index.html

The Education Group STAR Websites Stellar Websites SurveyMonkey WebMoira TWC Somerville Weather Home MIT IS&T

StarGenetics Home Biochem Genetics Orf Biogene Hydro Molsim Cluster Hpc

star > genetics > Home

## StarGenetics

StarGenetics is a Mendelian genetics cross simulator developed at MIT by biology faculty, researched-trained scientists and technologists at MIT's [OEIT](#). StarGenetics allows students to simulate mating experiments between organisms that are genetically different across a range of traits to analyze the nature of the traits in question. Its goal is to teach students about genetic experimental design and genetic concepts. For more information on StarGenetics click [here](#).

### Using StarGenetics

StarGenetics is freely accessible via the web. Press the **Start** button to get started.

**Start** ← klike la a pou demare StarGenetics

Manual

Feedback

### Overview

StarGenetics can be used to teach simple genetics concepts that are appropriate for high school biology students as well as complex genetics concepts that are appropriate for advanced biology undergraduate students. In addition, StarGenetics allows for instructors to customize the exercises presented to the student. To find out how to create your own StarGenetics exercise and for more information on the concepts that can be taught using StarGenetics, click [here](#).

StarGenetics simulates genetic experiments using known model organisms such as Mendel's garden peas, flies (*Drosophila melanogaster*), and yeast (*Saccharomyces cerevisiae*). StarGenetics simulate crosses in cows, which can be used to explore traits in organisms with similar genetics to humans. In addition, StarGenetics can simulate crosses between non-model organisms such as "smiley faces", which are typically used for introducing genetic concepts to younger



## Ekip HHMI Edikasyon

Lourdes Alemán  
Alison Brauneis  
Stacie Bumgarner

## Ekip STAR

Sara Bonner  
Stacie Bumgarner  
Rocklyn Clarke  
Ivan Ceraj  
Justin Riley  
Chuck Shubert

## Depatman Biyoloji

Graham Walker  
Chris Kaiser  
Diviya Sinha

## ODL

Vijay Kumar

## Kolèg

Melissa Kosinski-Collins  
Megan Rokop  
Kathy Vandiver

## Finansman ki soti deyò MIT

HHMI  
Davis Educational Foundation

## Enstitisyon ki kolabore

Brandeis University  
Broad Institute  
Howard University  
MIT Museum  
Suffolk University  
Tufts University

[star@mit.edu](mailto:star@mit.edu)

<http://web.mit.edu/star>

[educationgroup@mit.edu](mailto:educationgroup@mit.edu)

<http://educationgroup.mit.edu/>

# Remèsimam pou

