

- Jorge Medina

News fEEB

Ecology and Evolutionary Biology Monthly Newsletter

October 2022 • Volume 5 • Issue 2

Author: Mason Clark



SCAN ME

Announcements

OSOS - The Open Source for Open Science Workshop was once again very successful this year with over 150 attendees across the 10 modules taught! Woot!

Darwin Day – We are in need of a new **Darwin Day Chair** (e’hem EEB faculty) to help reboot our once highly successful Darwin Day event. We will also need **volunteers** (faculty and graduate students) for the Darwin Day Planning Committee.

Want to submit a story or announcement for the *News fEEB*?

Let us know by [clicking HERE](#)

EEB Seminar Series

Oct 24th – Serguei Drovetski (USGS)

Oct 31st – Graduate Students

- Natalie Aguirre
- Mason Clark

Nov 7th - Katie Marshall (UBC)

Nov 14th – Alfred Roca (UIUC)

Nov 28th – Marco Alberto Luca Zuffi (UniPi)



Follow us on Social Media!

Twitter: [@TAMUEEB](#)

[Facebook](#)

And updates on our [website!](#)

You or a colleague accomplish something? Let us know by tweeting **#TAMUEEB**



For more information visit:
eeb.tamu.edu

The Halloween Genes: Insects on Steroids

Insects are pretty nifty creatures when it comes to development. Have you ever wondered what's happening under the hood of the exoskeleton as caterpillars molt into larger instars, eventually metamorphosing into alien-like pupae and finally into mature butterflies or moths? The process of metamorphosis is no trivial task, and it is tightly regulated by titers of specific insect hormones in the body. It's a concerted process that requires participation from all the cells and organs in order to successfully resize and reconfigure the body as the insect develops to new stages.

But what oversees this complex process? Similar to humans, anabolic steroid hormones regulate development of the insect body. The most common molting steroid hormone is ecdysone. Caterpillars, for instance, have a steroidogenic organ called the prothoracic gland where stores of cholesterol are converted to ecdysone, which is then released into the insect blood (called the hemocoel). Ecdysone then enters the cells of other organs where it is converted to its active form 20-hydroxy ecdysone (20E). This active form engages with proteins in the cell that eventually regulate the expression of a multitude of genes that play even more specific roles in metamorphosis (insect people call this ecdysis).

Scientists have long wanted to know what genes regulate the conversion of cholesterol to the polyhydroxylated steroid hormone. To my delight, a group of researchers that elucidated a fair portion of this pathway were huge Halloween fans. Through the process of elimination (e.g., gene knockouts in *Drosophila*), a family of cytochrome P450 enzymes which they colloquially called the Halloween Genes were identified over two decades and given super spooky names based on the mutant flies they observed when certain genes were knocked out. These include *spook*, *phantom*, *shadow*, and *shade*, to name a few. My personal favorite is *disembodied* because knocking out this gene causes extreme developmental abnormalities that prevent the development of the fly's head.

In hindsight, the naming convention of the Halloween Genes is rather uninformative. Other insects may not show the same kind of mutant phenotype when homologous genes are knocked out, and the names themselves do not describe the function of the gene. On the other hand, the names remind us of a pre-omics era when we did not have the nearly 100,000 whole genome sequences we have today whose genes, as they are experimentally described, will require a systematic approach to naming and classifying. All in all, we've really come a long way!

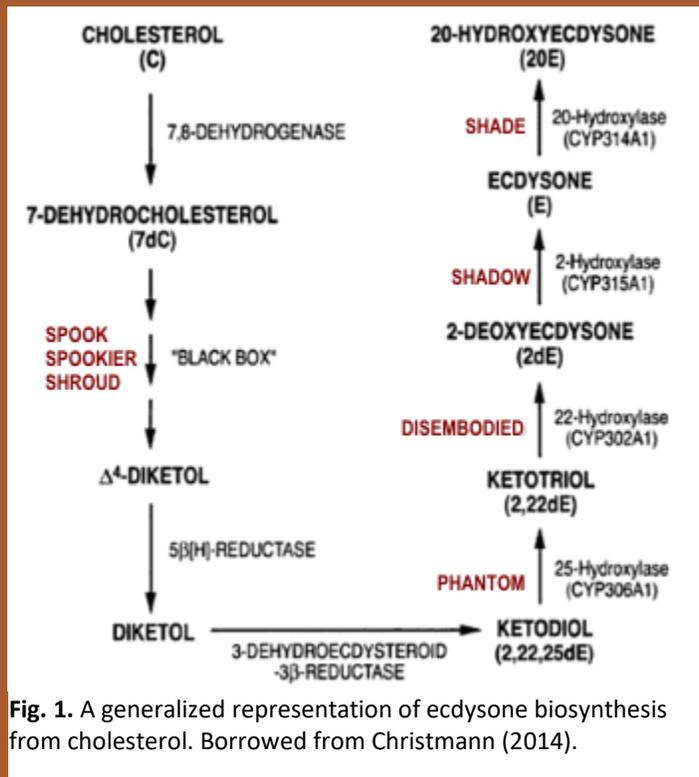


Fig. 1. A generalized representation of ecdysone biosynthesis from cholesterol. Borrowed from Christmann (2014).



Spooky labs with spooky limericks

*There once were mangroves in mass,
Until one cold winter, they passed,
Encroachment no more,
Rotting bark galore,
Their future we cannot forecast.*

-Brooke Torjman

*A pest of cotton should hope you are not,
when we are inspecting our cotton field plots,
'cause we'll research all the ways,
to shorten your days,
until you exist no más.*

-Mason Clark

*There once was a bug who would kiss,
A smooch that you'd sure rather miss,
It bit you and fed,
And now you're all dead,
All because of a little bug piss.*

- Ed Davila

*Cat shared with me,
Bartonella from a flea,
Surprise surprise!
Immunocompromised...
I guess that's bye for me?*

- Sujata Balasubramanian

*Spooky and scary, fill Song's students with freight,
Stinky poop and vomit with jaws that will bite,
Once you smell it, you will soon suspect,
It's the Mormon cricket or Anabrus simplex.
If there are more experiments with this species,
I shall do them in spite*

-Danielle Sherry

*When an insect devours a plant,
it's forced to release a chant,
"Come hither, worm slayer..
... bye bye you betrayer
HAHA here's the end of my rant."*

- Natalie Aguirre

*The kissing bug visits at night,
And feeds on your blood with a bite,
It poops out a friend,
Who's now yours 'til the end,
And lives in your heart 'til it stops.*

- Carlos Rodriguez

*Cache valley, Chikungunya, Dengue,
Japanese, La Crosse, St. Louis E,
Rift Valley, Ross River, West Nile and JCV
Yellow Fever, ZikV
Dude! Are y'all tryin' yet to squash me?*

- Sujata Balasubramanian



And a special *la calaverita literaria*

Jorge H. Medina-Duran

In Mexico we have something like limericks that we write in “El Día de los Muertos” (The Day of the Death). We call it “calaverita literaria”, and they are funny verses or poems whose main reason is the death, making it an excuse to do a parody of how someone is going to die. In a way, describing absurd and funny deaths to your family or friends is a way to actually say the opposite, that we love them and that we wish them long life.

For the non-Mexican native Spanish speakers, it contains a little bit of Mexican slang. For the English speakers, I included a rough translation of the verses, although it loses the rhymes and the slangy parts are hard to literally translate. It also contains some references to our lab culture.

I hope you enjoy.

Some words to consider:

Flaca (skinny) = La Muerte, Catrina. Similar to Grim Reaper, but in Mexico is female.

Unites = Slangy way to say United States, at least in Mexico.

Grillero = Stems from the word cricket (grillo). A colloquial way in Mexico to refer to people (mainly in the political circles) who is all the time arguing and fighting for useless things.

Calaverita para el Song Lab

¡La flaca ya hizo los tramites!
¡Ya se nos va pa’ los ‘Unites’!
Ella se quiere llevar la vida,
De los de Entomología.

Del Song Lab echada ya está su suerte,
Ellos fueron los primeros,
Por andar de grilleros,
La flaca a todos les dio muerte:

A Brandon y Jackson,
fijados en etanol y puestos en la colección.
Y a Seema y Maeva,
les sacó el ARN en una extracción.

En cuarentena yacen Vivian y Alyssa,
puestas en una repisa.
Y muerta en “La Tiendita” quedo Carla,
ahogada con una papita.

A Jorge le dio muerte digna,
lo infecto con una gregarina.
Y todos los undergrad se alegran,
¡Porque en el lab como friegan!

Al Dr. Song le dio la peor muerte,
Y eso a la flaca le divierte,
Por tener la agenda angosta,
¡Hojun fue devorado por una langosta!

Calaverita to the Song Lab

The Death already did the paperwork!
In order to travel to the United States!
She wants to take the life,
Of the people in Entomology.

The luck of the Song lab is settled,
They were the first,
For being so noisy,
The Death gave death to all of them:

To Brandon and Jackson,
She fixed in ethanol and stored them in the collection room.
To Seema and Maeva,
She extracted their RNA.

In the quarantine room lies Vivian and Alyssa,
Placed in a shelf.
And Carla is dead in “La Tiendita”,
choked by a chip.

She gave Jorge a dignified death,
She infected him with a gregarine.
And all of the undergrads are happy,
Because in the lab everybody is annoying!

To Dr. Song she gave the worst death,
And that makes laugh The Death,
Because he has a tight schedule,
Hojun was devoured by a locust!



**ECOLOGY and
EVOLUTIONARY
BIOLOGY**

For more information visit:
eeb.tamu.edu