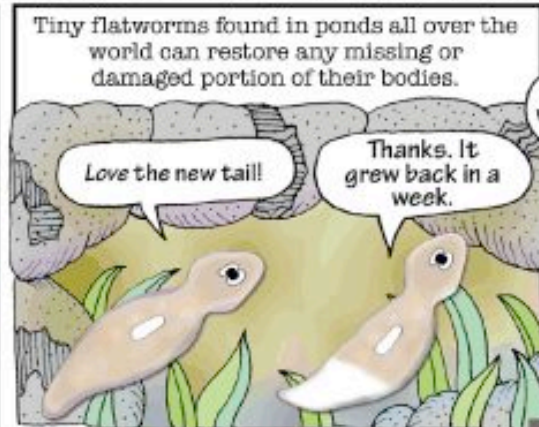
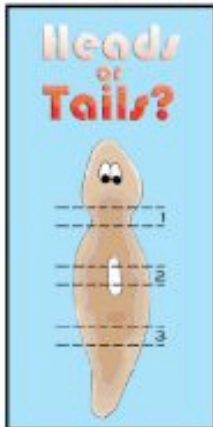


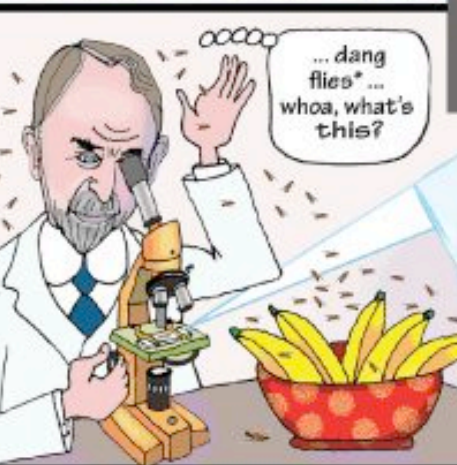
Whitehead tales

story by Carol Cruzan Morton | art by Peaco Todd



In fact, just about any piece of a flatworm grows itself into a new body, **Thomas Hunt Morgan** observed more than 100 years ago.

* Morgan's research with fruit flies won him a Nobel Prize in 1933.



A century later, **Peter Reddien** found more old scientific studies in the library basement.



After Reddien opened his Whitehead lab, **Christian Petersen** started looking for genes that told the animal where to position and how to restore a head or other body part.

Dinnertime!

Using a technique called **RNA interference**, Petersen slipped individual gene-blocking elements into the flatworms' liver paste meal.

Paté again?

I crave good old-fashioned mosquito larvae.

One week later, Petersen cut the flatworms. He waited another week to observe the effects of each blocked gene.

Just a flesh wound.... Here we grow again.

In most cases, the worms regenerated normally...

...except for the dish with the blocked **Smed-beta-catenin-1**.

TWO-headed worms!

beta-catenin

This was a major clue to an old question.

Two heads are better than one. I agree.

Hear, hear! So true.

Ah, shut up.

In other animals, beta-catenin takes orders from genes called **Wnt**.

Me, too!

We think Wnt turns on beta-catenin in worms, too. Then beta-catenin turns on the genes that tell tissue to grow into a head or tail.

Reddien and Petersen found different kinds and amounts of Wnt proteins lined up from head to tail in the flatworm.

Even whole flatworms need ongoing direction from Wnt genes, acting through Smed-beta-catenin-1, to maintain their bodies. Otherwise, tails eventually morph into heads.

Where did that come from?

We're a little low on beta-c.

Liver Paté

* with beta-catenin blocker

We think we're beginning to understand how animals take shape from head to tail.