

Tidelines

Sep 2019

St. Petersburg Shell Club, Inc.

Web site: stpeteshellclub.org

Shell Club meetings are held on the first Friday of the month, except June, July and August, at the **Seminole Recreation Center, 9100 113th Street North, Seminole**. The doors open at 6:30p.m. and the meetings start at 7:00 p.m. The public is always invited.

How a snail's shell gets its twist

By Vicky Stein

Science May 14, 2019 posted on Facebook from the PBS News Hour site

Symmetry is a feature of many plants, animals and even some molecules — like water. But that's not the case with snails and their coiled shells.

They are chiral — asymmetrical in such a way that they can't be superimposed on mirror images of themselves. Golf clubs have chirality, as do scissors and shoes. There are clubs and scissors made for right-handed and left-handed people, and good luck walking with a left shoe on your right foot.

"Right-handed" snails, or snails whose shells spiral clockwise from their smallest point, can only be the mirror image of "left-handed" snails, whose shells spiral anticlockwise. A snail's slimy organs and parts follow suit, developing with a twist that echoes the asymmetrical shell — a fact that inspired a team of researchers to identify that trait's source.

According to a study published Tuesday in "Development", this fundamental spiral is all down to one gene.

"There aren't many phenotypes you can just put your finger on," said Reiko Kuroda, a chemist and developmental biologist from Chubu University in Japan who is the study's senior author.

Most characteristics in living things are based on a slate of genes, like the 10 or more genes that affect a person's eye color, or the hundreds of genes that each contribute to a person's height. In this rare case, a single gene affects a single protein, which changes the way the cells grow their structure and eventually affects the shape of the entire snail, inside and out.

Moreover, her team found a snail's chiral nature starts from its earliest moment as a single cell.

What the researchers did

Great pond snails — *Lymnaea stagnalis* — grow almost as big as a golf ball. Nearly all of them feature right-handed bodies and shells, but about 2 percent of the population spirals the other way.



Just one gene in these snails controls whether their shells — and the rest of their bodies — coil to the left or the right. Image by Hiromi Takahashi via dev.biologists.com



A MESSAGE FROM THE DESK OF YOUR PRESIDENT

Hi all,
With a new shell club meeting season starting up, my thoughts turn to past and future shell-related reflections. Cheryl and I participated in the COA convention held on Captiva Island this past June. I came away with several new additions to my collection which I am currently researching and cataloging. I'll be presenting a talk on this convention at the first meeting of the Suncoast Conchologists in September.

Sometime around three decades ago, the club donated many shells for display at the Science Center in Pinellas County. We used to hold our meetings there. With the advent of the center possibly being sold, we made an effort to find out the status of the shells which had been put on display. The displays were gone, and no one there knew anything about the shells. Thankfully, Marilyn and Stan Myers were able to coordinate with the center, and the shells are now back in our possession. I wish to extend my whole-hearted gratitude to them for all they did. If not for this, the shells could very easily have ended up in a dumpster.

The future is bringing shell shows (including our own), field trips, the next COA convention in Melbourne, Florida, and lots of fun. Now that I am fully retired, I have the time to take more advantage of the opportunities to participate in these events.

Wishing you all the best,

John

Tides are for Mullet Key Channel (Skyway). Other specific locations may be up to 2 hours later or earlier. Listings from saltwatertides.com.

Club Officers and Committees

President John Jacobs; Vice President Robert Gould; Recording Secretary open; Treasurer Tamara Hein; Newsletter Editor Cheryl Jacobs; Directors at Large: Peggy Dill, Jane McKinney, Otis Taylor; COA Representative John Jacobs; Refreshments open; Photographer John Jacobs; Field Trips Entire Board; Corresponding Secretary Pat Linn, Shell Show Cheryl Jacobs; Annual Picnic the Board; Raffle/Door Prizes Cheryl Jacobs & Peggy Dill; Facebook Cheryl Jacobs; Webmaster Cheryl Jacobs.

Forecast Minus Tides

Sep

No minus tides

Oct

29 Tue 7:41AM -0.1
30 Wed 8:29AM -0.2
31 Thu 9:18AM -0.1

Nov

12 Tue 5:53AM -0.1
13 Wed 6:28AM -0.2
14 Thu 7:08AM -0.3
15 Fri 7:53AM -0.3
16 Sat 8:45AM -0.3
17 Sun 9:45AM -0.2
18 Mon 10:50AM -0.1
25 Mon 5:08AM -0.3
26 Tue 5:53AM -0.5
27 Wed 6:36AM -0.5
28 Thu 7:19AM -0.5
29 Fri 8:03AM -0.4
30 Sat 8:49AM -0.3

Dec

1 Sun 9:37AM -0.2
2 Mon 10:28AM -0.1
9 Mon 4:27AM -0.1
10 Tue 5:05AM -0.3
11 Wed 5:43AM -0.5
12 Thu 6:22AM -0.6
13 Fri 7:04AM -0.6
14 Sat 7:50AM -0.6
15 Sun 8:39AM -0.6
16 Mon 9:31AM -0.5
17 Tue 10:24AM -0.3
18 Wed 11:18AM -0.1
22 Sun 3:27AM -0.2
23 Mon 4:20AM -0.5
24 Tue 5:07AM -0.6
25 Wed 5:50AM -0.7
26 Thu 6:30AM -0.7
27 Fri 7:08AM -0.6
28 Sat 7:45AM -0.6
29 Sun 8:22AM -0.5
30 Mon 8:59AM -0.4
31 Tue 9:38AM -0.2

Jan 2020

6 Mon 3:21AM -0.2
7 Tue 4:08AM -0.5
8 Wed 4:52AM -0.6
9 Thu 5:35AM -0.7
10 Fri 6:18AM -0.8
11 Sat 7:00AM -0.9
12 Sun 7:43AM -0.8
13 Mon 8:26AM -0.7
14 Tue 9:08AM -0.6
15 Wed 9:49AM -0.3

Upcoming Club Meetings

6:30pm Meet and Greet, 7pm Meeting

Sep 3 Meeting of Suncoast Conchologists

Sep 6 Regular Meeting John Jacobs will be speaking "A World of Shells Captiva COA Convention".

Sep 7 Tampa Bay Fossil Club Meeting

Oct 1 Meeting of Suncoast Conchologists

Oct 4 Regular Meeting to be announced.

Oct 5 Tampa Bay Fossil Club Meeting

Oct 12 Vulcan mine field trip. See article on page 6.

Nov 1 Regular Meeting to be announced.

Nov 2 Tampa Bay Fossil Club Meeting

Nov 5 Meeting of Suncoast Conchologists

UPCOMING SHELL SHOWS & RELATED EVENTS

Oct 19-20 **FOSSIL FAIR** Florida Fossil Hunters, Central Florida Fairgrounds, Orlando, FL

Jan 13-12 **55th ANNUAL BROWARD SHELL SHOW**, Emma Lou Olson Civic Center, 1801 NE 6th St, Pompano Beach, FL. www.browardshellclub.org

Jan 18-19 **ASTRONAUT TRAIL SHELL SHOW** Eau Gallie Civic Center, Melbourne, FL

Feb 7-9 **SARASOTA SHELL SHOW**, Roberts Arena in Potter Building, 3000 Ringling Blvd. Sarasota FL

Feb 15 **FLORIDA UNITED MALACOLOGISTS MEETING**

Feb 15 **FOSSIL FESTIVAL** The Shell Factory, Ft. Myers, FL

Feb 21-22 **ST PETERSBURG SHELL SHOW** Seminole Recreation Center, Seminole, FL

Mar 5-7 **SANIBEL SHELL FAIR** Sanibel, FL

Mar 14-15 **FOSSIL FEST** Tampa Bay Fossil Club, Florida State Fairgrounds, Tampa, FL

COA Convention 2019

Here are two pictures from the Snail Parade, John with the Birthday Snail and the crew that "Snailed it". Sharlene Totten, Carolyn Petrikin and Mary Ellen Akers were the people that put on the Snail Parade.

Sanibel was a nice venue for the convention and I think everyone had a good time. The Silent Auctions were busy, the Snail Parade had a fair number of voters and participants. We had a great



group of speakers and the bourse was fantastic. The oral auction was fun and exciting.

Hope you can come to the convention next year in Melbourne. June 15-21, 2020.

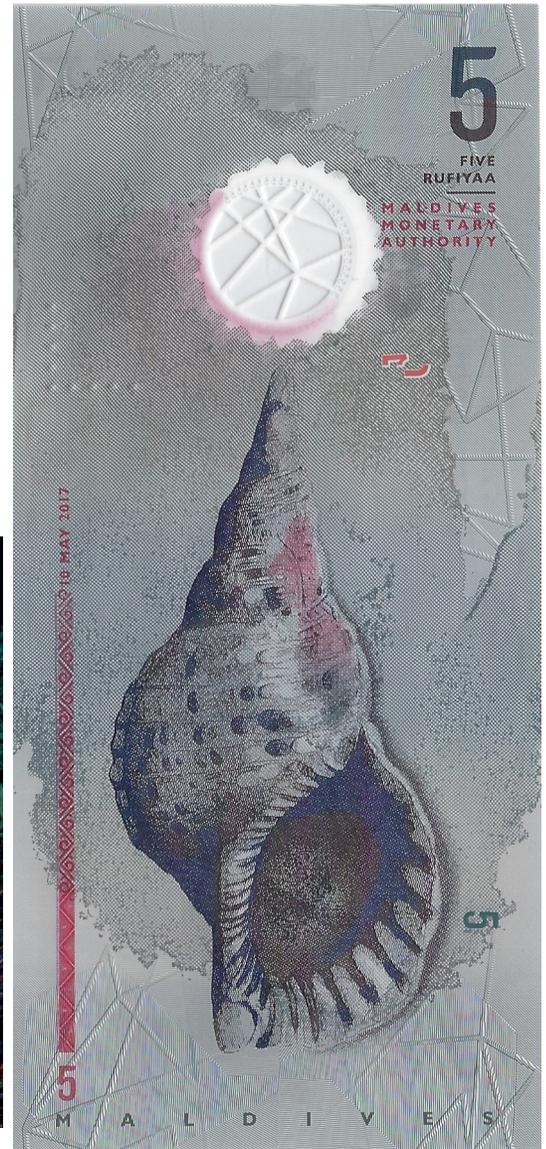
Shells on Money by John Jacobs

Besides shells themselves, there are many ways to collect these fascinating animals. One way is on money, either depicted on coins or paper/plastic notes. Currency is no longer just printed on paper. Many countries actually use plastic because of its durability, and increased difficulty in counterfeiting.

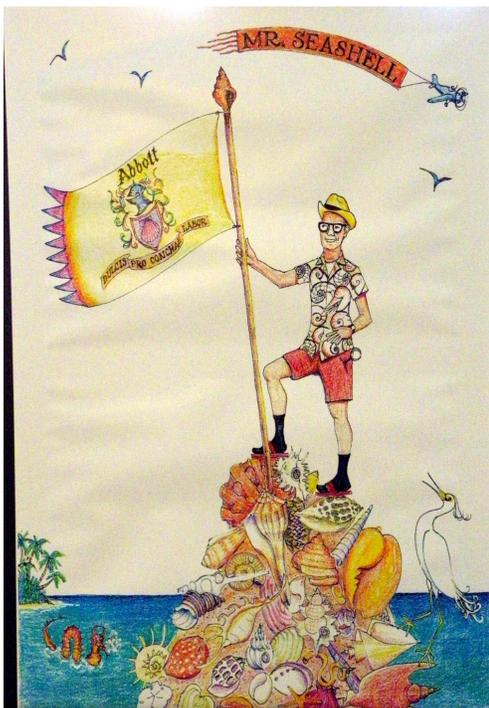
The featured item here is a 5 rufiyaa note from the Maldives issued in 2017. The shell depicted is the Pacific Triton's trumpet, *Charonia tritonis* (Linnaeus, 1758). This is a large predatory snail found throughout the Indo-Pacific which is known to feed on crown-of-thorns sea stars. These large sea stars can decimate a coral reef. The tritons are about the only predator of the stars, and help keep their population in check.



Charonia tritonis attacking a crown-of-thorns sea star (Alamy stock photo)



COA Pictures



Mary Ellen Akers did the art work for the convention. Here is just one of the original posters she did. Tucker Abbott is Mr. Seashell.

There was a shell shirt competition during the Welcome Party. Here are the winners.



That twist has fascinated researchers back to the Victorian age, said Kuroda. In 2016, she and her team proposed that a single gene — known as *Lsdia1* — was likely related to snail chirality, but she didn't feel that the question was fully settled. Even with the earlier study, there was still a chance that the true "handedness" gene was simply located near *Lsdia1* on the snail chromosomes.

With the 2015 discovery of CRISPR, a gene-editing tool that can accurately snip out sequences of DNA, Kuroda realized that she and her team could "knock out" *Lsdia1* and see if its absence could create mirror-image snails.

Under a microscope, the researchers injected snail eggs with CRISPR, which worked as a molecular pair of scissors, seeking out and removing just the copies of *Lsdia1* from the snail's genes. Recent work with CRISPR technology has revealed that it can have off-target effects, cutting into genetic material that researchers didn't intend to alter, but in this case the researchers reported no evidence that any gene but *Lsdia1* was harmed. As proof of its accuracy, the team checked another very similar gene — *Lsdia2* — and found it intact.

That's important because *Lsdia1* and *Lsdia2* both act as genetic blueprints for two versions of a protein called formin.

Formin helps assemble tiny strands of actin, another protein that's crucial to engineering the basic structure of life. Actin is the most abundant protein in most animal and plant cells.

The formin sits at the top of each actin strand — a filament — and helps them grow, said cell biologist Tim Mitchison of Harvard Medical School, who was not involved in this study.

"You can think of it as a molecular dance," Mitchison said. As a formin builds actin filaments, the filaments spread out in a cell, pushing against its sides and propping up our bodies' 3-D shape. Aside from forming our cells' internal structure, actin filaments aid the contractions of muscle and non-muscle tissue.

After CRISPR chopped out *Lsdia1*, a developing snail had to rely entirely on the slightly altered formins encoded by *Lsdia2* to build vital actin fibers. And in the absence of *Lsdia1*, the team found whole generations of snails developed left-handed shells — a trait rarely seen in nature. The researchers concluded that *Lsdia1* must have been the gene responsible for giving snails their more typical right-handed twist.

Then, they delved a little deeper into the development of left-handed snails, looking at the growth of their offspring.

That's because snails actually develop their twist based on their mother's genes — the genes that formed the egg from which they grow. By the time that a single egg cell is fertilized and begins to split into two, a snail's right- or left-handed fate is decided.



By the time these snail eggs are a single cell each, their mother's genes have already determined whether they will be right- or left-handed. Image by Frank Vincentz/Wikimedia

Kuroda could actually see the beginnings of asymmetry from the single-cell stage.

Why it matters

Chirality is abundant in the microscopic world of molecules. Amino acids are all left-handed when they serve as the building blocks of life on Earth, yet out in the cosmos, they're both right- and left-handed. The artificial sweetener aspartame in your diet soda is always left-handed, while its mirror image is tasteless.

Kuroda's work links a single gene to an entire body plan, demonstrating how chirality can stretch from the atomic scale of molecules to the visible, tangible world of a snail.

"It's sort of a lovely problem in biology," Mitchison said. "It's not going to cure cancer or save the rainforest. It's one of those curiosity problems for its own sake, although you never know — there could be medical applications, too."

Mitchison studies the way that cell structure — namely a molecule similar to actin called a microtubule — affects human health. Some types of chemotherapy, for example, work to stabilize or destabilize microtubules. Inflammatory diseases like gout are linked to an overabundance of microtubules, and neurodegenerative diseases like ALS and Alzheimer's feature missing microtubules in nerve cells. Given that, he's charmed by the idea of research undertaken for its own sake in order to answer a fundamental biological question.

"What Kuroda is really looking for is a way that the chirality of building blocks gets amplified up into the chirality of the organism," Mitchison said. "These snails have a wonderful story to tell us."

Kuroda began her research career as an X-ray crystallographer, a chemist who studied the way proteins and other molecules fit their atoms together. Although her current research deals with sticky snails rather than the elegant images produced in X-ray diffraction, she's still fascinated with the way billions of molecules gather to form crystals, DNA, proteins and eventually living creatures.

In Japan, where she does her work, Kuroda is just past the country's mandatory retirement age. But, she said, she still has too much left to do.

According to Kuroda, "They told me, maybe it's a good time for you to retire and take it easy. I said, 'No, thank you.'"

Instead, she's moved her equipment and her colony of snails (which she transported via bullet train) to a new lab.

Field trip:

Vulcan Mine Field Trip

October 12, 2019

Meet at 8:30, going in at 9am (Once we have gone into the pit, the gate will be closed, so don't be late! You will NOT be allowed in after the gate is closed.) We all leave at the same time.

Address: 16313 Ponce de Leon Blvd, Brooksville, FL

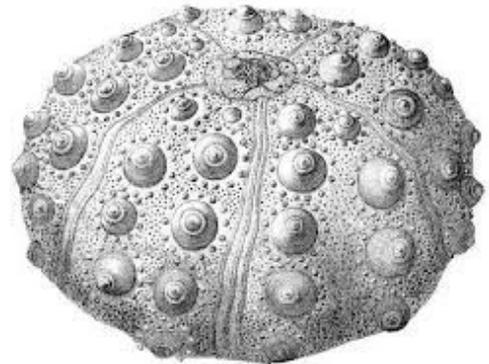
This is a fossil collecting trip primarily for echinoids such as sea urchins, sea biscuits, and sand dollars.

A waiver will be signed by all attendees (will have at the meeting and at Vulcan). You must check in with John before we drive in, so that we know who is there.

There is no bathroom where we will be at **so go before you arrive**.

Wear hat, sunscreen, closed toe shoes. Bring bucket, screwdriver, hammer, chisels, trowel, etc.

Contact John Jacobs 813-309-2608 or 309-0295,
email johncheryl@earthlink.net



THE SHELL COLLECTOR'S CODE OF ETHICS

I realize that molluscs are part of our precious national wildlife resources, therefore:

I WILL make every effort to protect and preserve them not only for my own future enjoyment, but for the benefit of generations to come.

I WILL always leave every shelling spot as undisturbed as possible.

I WILL take only those specimens needed for my collection and for exchange at the time... Shells in a box cannot reproduce while I am waiting for a place to send them.

I WILL leave behind the damaged and the young specimens so that they may live and multiply.

I WILL **NOT** collect live egg cases unless they are to be used for study, and then, only in small quantities.

I WILL **NEVER** "clean out a colony" of shells.

I WILL practice and promote these conservation rules in every way possible.

MEMBER NEWS

Hoping all our members that had Birthdays during the summer had a great day.

A BIG Thank you to Marilyn Myers for working so hard to get our shells back from the old Science Center. The building is being sold and demolished so we are very glad to have these items back.

Wishing Sandy Boddy a speedy recovery from her knee surgery.

Got a shell question???
Send me an email. I will try to answer it in the [Tidelines](#).

Send in any member news to Cheryl Jacobs
Email stpeteshellclub@gmail.com

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Monday thru Saturday

Happy Birthdays

Sep

2 – Otis Taylor
10 – Linda Taylor
11 - Sharlene Totten
20 – Robert Marchiselli

Oct

11 – Barbara Fite
19 – Doug Thompson
21 – Earl Petrikin
21 – Peggy Dill
24 - Meredith Myers
26 – Dolores Seagren
31 – Carol Harrison

Nov

4 - Rob Geater
7 – Isabel McKinney
9 – Carolyn Petrikin
11 – Robert Holzworth
13 – Marilyn Myers



St. Petersburg Shell Club, Inc.
Founded 1936
Annual Dues: Individual \$15.00
Family \$20 (1 copy of TIDELINES per household)

Meetings are held on the 1st Friday of the month, except June, July and August, at the **Seminole Recreation Center, 9100 113th Street North, Seminole**. Meetings start at 7:00p.m. and include educational short programs, social times, opportunities to identify shells, and a main program on some aspect of the shell collecting hobby. The club publishes "**TIDELINES**" 5-6 times a year with a special edition at Shell Show time. The membership year begins Jan 1st and dues are delinquent after Apr 1st. Please make your check payable to the St. Petersburg Shell Club.

Return the application to the membership chairperson at the address below.

Please complete—Detach and Return

New Member: Individual _____ Family _____
 Renewal: Individual _____ Family _____

Name: _____ Phone: _____

Address: _____ Apt# _____

City, State, Zip: _____

E-mail: _____

Birthday: _____ Shell Interests: _____

If you use another address part of the year, please list where & when here:

Donation to the Awards and Ribbons Fund for the Shell Show

Print as you want to be listed.

Return to: Membership Chairperson
 P. O. Box 3472
 Seminole, FL 33775-3472

	Total Enclosed:
Membership \$ _____	
Awards and Ribbons Fund \$ _____	
Total \$ _____	

E-mail: stpeteshellclub@gmail.com
 Web site: stpeteshellclub.org
 Like us on Facebook

Show 'n Tell
 Bring that special shell to the meeting and talk for a few minutes about it. What was it that appealed to you about that specimen? Was it the color, the family, the location it came from?

Do you have a question on the identification of a shell? Whatever the reason, blow your horn, show it off.



HAVE I RENEWED ?



Our club membership runs from January to December. If you are not sure if you have renewed call or email us.

Contact Cheryl & John Jacobs
johncheryl@earthlink.net
 or 813-309-2608