

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 9/4/18	Animal ID:	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: MOUSE	Strain/Sex: BU ♂
Investigator: [REDACTED]	Lab Contact: [REDACTED]	Phone No.:

Observations/Comments:

FDIC - BU MICE FOLLOWING IC SURGERY

9/1/18 - 1 MOUSE FROM GROUP/CAGE # 14

9/2/18 - 1 MOUSE FROM GROUP/CAGE # 18

9/3/18 - 1 " " " # 16

9/3/18 - 1 " " " # 15

Clinical Call Submitted By (Name/Date): G 9/4/18

# Veterinary Clinical Call Record

(Continuation Sheet)

Protocol No.: [REDACTED]	Species: MOUSE	Page No.: 1
Surgical Procedure: IC SX	Surgery Date:	Pre-Surgery BW:

Date	Time	Observations/Treatment	Initials
9/4/18	4:05	PI/RP CONTACTED BY ARC FOLLOWING INFORMATION (HX) PROVIDED BY RP: - MICE FROM SURG. COHORT (40 TOTAL) - SX PERFORMED OVER HOLIDAY W/4ND. - FD MICE DIED ON 2ND DAY PO. ACCORDING TO RP - SX PERFORMED AS PREV. TRAINED NO CHANGES. HEMORRHAGE & FROM DEEP LYING IC INJX PREV. OBSERVED - POSSIBLE RESP. DEPRESSION P) SUGGESTED FOLLOWING MOD. TO SX & PO PLAN. PENDING NECROPSY • DIC BUPRENORPHINE • CONT. O <sub>2</sub> ADMIN UNTIL ANIM. IS EG. ADVANCE	
9/5/18	10:40	TWO ADDITIONAL CARCASSES DISCOVERED IN FREEZER. THESE APPEAR TO BE FROM THE SAME SX COHORT. - FD - 8/20/18 - ♂ MOUSE FROM GROUP/CASE #5 & 8 (1 ES)	
9/5/18	10:45	NECROPSY - PRONOUNCED CEREBRAL HEMATOMA IN BOTH MICE FD ON 9/3. NO OTHER GROSS LESIONS. MOUSE FROM 9/2 - NO BRAIN LESIONS OR OTHER GROSS LESIONS. MOUSE FROM 9/1 - CARCASS TOO DECOMPOSED	
9/5/18	11:18	MET w/ RP TO REVIEW FINDINGS & DISCUSS CHANGES - DIC BUP. WAS ALREADY PROVIDING VENT. / OXYG. FOR MICE DURING / AFTER SX	

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 9/19/18	Animal ID: NA	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: SWELL SHARIC	Strain/Sex:
Investigator: [REDACTED]	Lab Contact:	Phone No.:

Observations/Comments:

JUV. SWELL SHARIC FOUND DEAD

Clinical Call Submitted By (Name/Date):

MG 9/19/18

# Veterinary Clinical Call Record

(Continuation Sheet)

<b>Protocol No.:</b>	<b>Species:</b>	<b>Page No.:</b>
<b>Surgical Procedure:</b>	<b>Surgery Date:</b>	<b>Pre-Surgery BW:</b>

[illegible]



Case No.: [REDACTED]

Obtained: NA, rec'd 09/27/18  
Reported: 10/02/18

Dr. Manny Garcia  
University of California Santa Barbara  
Animal Resource Center  
Santa Barbara, CA 93106-5060

Patient ID: Swell Shark  
Account #: [REDACTED]  
Telephone: (805) 893-2333  
FAX #: 893-2005  
E-mail: manuel.garcia@ucsb.edu

**HISTORY:** This 7-month-old, captive bred shell shark was found dead. Necropsy revealed yellow/brown and edematous gill lamellae, a pronounced arch to the spinal cord caudal to the head, and thin body condition.

**CLINICAL DIAGNOSIS:** Open.

**GROSS:** Received in formalin are multiple tissues to 4 cm. in greatest dimension that are processed in three blocks.

**MICROSCOPIC:** **Spleen:** Lymphoid cellularity is moderately depleted. **Gill:** The secondary lamellae are mildly atrophic. **Liver:** The liver has a multiloculated cyst in one of the portal tracts. Lipid storage is adequate. **Stomach:** Mild edema is in the submucosa of the fundus and pylorus. **Coelomic cavity:** Some hemorrhage and edema are present in the serosa of some of the viscera. The following tissues are histologically within normal limits: pancreas, colon, rectal gland, epigonal organ, intestine, heart, ovary, and Leydig organ.

**HISTOPATHOLOGIC DIAGNOSIS:**

1. Lymphoid depletion, spleen.
2. Mild atrophy, secondary lamellae of gills.
3. Focal multiloculated cyst, liver.
4. Edema, stomach.
5. Acute hemorrhage, coelomic cavity.

**COMMENT:** The lymphoid depletion suggests stress, and the coelomic hemorrhage suggests trauma. The cause for the deviation in the cervical spine could not be determined from the submitted tissues, but you may want to consider the possibility of trauma. The atrophy of the gills is a mild lesion and likely due to hypoperfusion rather than suboptimal water quality or exposure to a toxin. The biliary cyst may be a developmental anomaly in this young shark and was considered incidental. The gastric edema is a typical shock related lesion in elasmobranchs. This fish was a female and was in excellent nutritional status at the time of death.

E-mail: [REDACTED]

[REDACTED] shock, probable trauma.

Reviewed by:

EG 10/2/18

Initials/Date

From: [REDACTED]  
Subject: Re: found dead swell shark  
Date: September 20, 2018 at 12:52 PM  
To: [REDACTED]  
Cc: mannydvm@mac.com, [REDACTED]



Hi Manny,

Here is the info you requested on the recently deceased juvenile swell shark.

Shark [REDACTED] *Cephaloscyllium ventriosum* was hatched in captivity from our fertile female shark on 3/1/18.

Since birth, it has been closely monitored:

1) Diet has consisted of minced fish every day, slowly increasing the quantity, over time, as it has grown and eaten more.

2) Water quality

a) Temperature- March was relatively consistent at 11-13 C. It began to increase in mid-June, and throughout the Summer months, at 15-18 C.

b) Oxygen-While there have been no clear signs of water quality issues, we have been concerned with dissolved oxygen levels, we recently purchased a dO monitor and are compiling data from all of the tanks.

3) Health: This shark has not had the red coloration, typically observed, prior to death. This swell shark has appeared consistently healthy throughout its history. Additionally, a bubbler has been operating in its tank to ensure that there was ample dO in the tank.

Let me know if there is anything else you'd like to know, and thank you for the information. If it is possible for me to ever sit in on a necropsy, I'd be very interested to do so.

Best,

On Thu, Sep 20, 2018 at 12:48 PM [REDACTED] wrote:  
Hi Manny,

Thanks for the speedy necropsy. This was a very special little shark to the [REDACTED]

I was wondering about your observations of the gill lamellae and the potential for hypoxia. Tangential info, the Life Support System for Tank [REDACTED] has a protein skimmer with an ozone generator. I currently do not use it because the O3 system was very finicky and we had some issues where fishes gills were getting "burned" by the high levels of Oxygen in the tank. My O-Chem is a little rusty, so I can't remember if O3 dissociates in sea water and just increases the overall dO in the water. Not sure if I am articulating this very well.

We have a bubbler in the little swell sharks tank, and I am wondering if there is a difference between how hypoxia vs. hyperoxia present. I remember the "burned" fish gills looked yellowish-brown but don't know if they were edematous.

Please feel free to call me to discuss further. Not sure any of that made sense!

Best,

On Wed, Sep 19, 2018 at 4:28 PM, Manuel A Garcia <mannydvm@mac.com> wrote:

The main findings from the necropsy of the swell shark carcass:

- 1) yellowish-brown and edematous gill lamella
- 2) pronounced arch to spinal cord behind the head
- 3) very thin body condition

There was no obvious indication that this animal's death was due to an infectious disease process, but I don't know what caused it to die. I suspect that the animal was hypoxic, but I don't know what the initial insult was (chemical toxicant, poor water quality, congenital/heritable abnormality).

Can you please send me the history on this animal so that I can include it in my notes to the pathologist?

Thanks  
Manny

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 10/2/18	Animal ID: T520F	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: [REDACTED]	Strain/Sex: ♀
Investigator: [REDACTED]	Lab Contact: [REDACTED]	Phone No.: [REDACTED]

Observations/Comments:

FDIC ON 10/1/18 - 520
FDIC ON 10/2/18 - 520

Clinical Call Submitted By (Name/Date): [Signature] 10/2/18

## Veterinary Clinical Call Record

(Continuation Sheet)

<b>Protocol No.:</b>	<b>Species:</b>	<b>Page No.:</b>
<b>Surgical Procedure:</b>	<b>Surgery Date:</b>	<b>Pre-Surgery BW:</b>

[illegible]

FINAL REPORT OF LABORATORY EXAMINATION

Received: 10/5/2018  
Completed: 10/12/2018

Submitted By

Manny Garcia  
University of California-Santa Barbara  
Animal Resource Center

Phone: 805-893-7344  
Fax: 805-893-2005  
Email: manuel.garcia@ucsb.edu

Santa Barbara, CA 93106-5061

Specimen Description

Species: rat

Purchase Order #: [REDACTED]

Number of Specimens/Animals: 2

Client ID	Species	Strain /Breed
526	rat	[REDACTED]
528	rat	[REDACTED]

Services/Tests Performed: Histopathology Services (1-2)

Histopathologic evaluation for: heart, intestine, liver, lung, spleen, stomach

**General Comments:** Weanling animals from in-house breeding colony fed high fiber diet. No other exp. manipulations found dead in cage 1 day apart. No clin. symptoms in remaining cage mates.; Tissues - unspecified

**Summary:** Animal 526 had marked splenic atrophy and possible pulmonary microthrombosis and inflammation. Specials stains (Gram and Steiner for bacteria, Fibrin for thrombi) of the lung sections have been requested. Results of the microscopic examination will be included in an addendum as soon as they are available.

The stomach and intestine submitted for animal 528 was too autolyzed for analysis. The livers of both animals had no significant tissue changes. Please see the report for details.

Reviewed by:

[Signature] 10/17/18

Initials/Date



## HISTOPATHOLOGY

### Animal: 526

heart	no significant lesions
liver	no significant lesions
lung	The alveolar septae are multifocally thickened due to deposition of a fibrillar pale eosinophilic material suggestive of fibrin within the capillaries. Increased numbers of neutrophils are also noted within the alveolar capillaries and small pulmonary veins. Special stains to screen the tissue for thrombi and bacteria have been requested. Results of these stains will be included in an addendum as soon as they are available.
spleen	Diffuse marked splenic atrophy of the white and red pulp. Both areas are poorly populated with scarce lymphocytes (white) and hematopoietic cells (red).

### Animal: 528

intestine	postmortem autolysis precludes satisfactory evaluation of tissue(s)
liver	no significant lesions
stomach	postmortem autolysis precludes satisfactory evaluation of tissue(s)

ADDENDUM TO FINAL REPORT OF LABORATORY EXAMINATION

Received: 10/5/2018  
Completed: 10/12/2018  
Addendum Dated: 10/16/2018

Submitted By

Manny Garcia  
University of California-Santa Barbara  
Animal Resource Center

Phone: 805-893-7344  
Fax: 805-893-2005  
Email: manuel.garcia@ucsb.edu

Santa Barbara, CA 93106-5061

HISTOPATHOLOGY

Animal: 526	
lung (fibrin)	Numerous areas of fibrin positive material, consistent with fibrin thrombi, are observed in pulmonary capillaries and within small vessels.
lung (Gram)	No bacterial organisms are identified on Gram stained sections of the lungs.
lung (Steiner)	No bacterial organisms are identified on Steiner stained sections of the lungs.

Case No.: [REDACTED]

Obtained: NA, rec'd 10/25/18

Reported: 10/30/18

Dr. Manny Garcia

Patient ID: [REDACTED]

#HF-4

University of California Santa Barbara

Animal Resource Center

Santa Barbara, CA 93106-5060

Account #: [REDACTED]

Telephone: (805) 893-2333

FAX #: 893-2005

E-mail: manuel.garcia@ucsb.edu

**HISTORY:** This wild caught [REDACTED] had a poor appetite, lumpy skin, and was euthanized for humane and diagnostic purposes.

**CLINICAL DIAGNOSIS:** Open.

**GROSS:** Received in formalin is one [REDACTED] to 5 cm. in greatest dimension that is processed in two blocks following appropriate decalcification of both blocks.

**MICROSCOPIC:** **Skin:** Skin of the tail has multifocal hyperkeratosis, mild epidermal hyperplasia, and bacterial colonization of the keratin layers. Some subdermal edema is noted. **Adipose:** Adipose stores are atrophic to the level of the bone marrow. The following tissues are histologically within normal limits: musculoskeletal system, central nervous system, ears, eyes, oral and nasal cavities, kidney, spleen, liver, heart, ovary, oviduct, and alimentary tract.

**HISTOPATHOLOGIC DIAGNOSIS:**

1. Marked atrophy of fat.
2. Multifocal epidermal hyperplasia and hyperkeratosis with bacterial colonization, tail.

**COMMENT:** Histologic findings are consistent with emaciation. The skin lesion is likely due to opportunistic bacterial infection and suboptimal environmental conditions or stress. Hypovitaminosis A may also have contributed to the skin lesion, although foci of squamous metaplasia were not noted in the visceral tissues. There could possibly also be a fungal component to the skin lesion, and a fungal stain is pending in this regard with an addendum to follow. This salamander was a female. It may have been maladapted to captivity.

**Addendum, 10/31/18:** A fungal stain (GMS) is negative; however, at the level of section for the fungal stain, a mite is detected in the keratin layers of the epidermis, and a separate microgranuloma is detected in the dermis. These lesions are consistent with acariasis, which in [REDACTED] can be associated with dermal granulomas and dermal migration of the mite. These lesions account for the "lumpy skin" noted clinically.

Reviewed by:

G 11/1/18

Initials/Date

E-mail: [REDACTED]

[REDACTED] cutaneous acariasis, emaciation, hyperkeratosis with bacterial colonization. Euthanasia

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 10/23/18	Animal ID: [REDACTED] 442, HF 4, HF6	Protocol No.: [REDACTED]
Location: [REDACTED]	Species:	Strain/Sex:
Investigator: [REDACTED] / GARUA	Lab Contact: [REDACTED]	Phone No.:

**Observations/Comments:**

LAB CONTACT REPORTED 1 [REDACTED]  
FDIC, & 2 THAT WERE SICL. 10/20/18, 3PM  
SEE EMAIL

Clinical Call Submitted By (Name/Date): MG 10/23<sup>2</sup>/18

## (Continuation Sheet)

<b>Protocol No.:</b>	<b>Species:</b>	<b>Page No.:</b>
<b>Surgical Procedure:</b>	<b>Surgery Date:</b>	<b>Pre-Surgery BW:</b>

[illegible]



From: [REDACTED]  
Subject: Re: weekly log  
Date: October 20, 2018 at 7:36 PM  
To: Manny Garcia <mannydvm@ucsb.edu>

I only started about 1 month ago. Exo-terra cricket quencher.

On Sat, Oct 20, 2018 at 7:26 PM Manny Garcia <mannydvm@ucsb.edu> wrote:  
thank you. are you gut-loading the crickets, and if so, what's the brand name of the cricket gut load that you're using?

Manny

On Oct 20, 2018, at 7:03 PM, [REDACTED] wrote:

I feed them once a week. The [REDACTED] eat fairly well. Upon cleaning their tubs after a feeding, I won't see any crickets and I'll see stools.

On Sat, Oct 20, 2018 at 3:55 PM Manny Garcia <mannydvm@ucsb.edu> wrote:

Hi [REDACTED]

Have these [REDACTED] been eating well? When were they last fed?

I'll have a look at them on Monday.

thanks

Manny

On Oct 20, 2018, at 2:58 PM, [REDACTED] wrote:

Hello Manny,

Here is the weekly [REDACTED] Husbandry Log. I found one [REDACTED] dead yesterday. The [REDACTED] don't seem to adapt as well to long term captivity as the [REDACTED] do. I pickled the dead [REDACTED]. The ID number was [REDACTED]

I put a note that [REDACTED] and [REDACTED] are "very thin" (you can see [REDACTED]'s vertebrate and ribs). They have been thin for some time now, but nothing has really changed over that time.

<2nd\_week\_Oct\_18\_[REDACTED].Husbandry\_Log.ods>

Case No.: [REDACTED]

Obtained: NA, rec'd 11/08/18  
Reported: 11/15/18

Dr. Manny Garcia

Patient ID: [REDACTED] Frog #1  
(tank #1 FD)

University of California Santa Barbara  
Animal Resource Center  
Santa Barbara, CA 93106-5060

Account #: [REDACTED]  
Telephone: (805) 893-2333  
FAX #: 893-2005  
E-mail: manuel.garcia@ucsb.edu

**HISTORY:** This captive bred frog of unstated age and gender had abnormal skin condition that included depigmentation and hemorrhage of one week's duration.

**CLINICAL DIAGNOSIS:** Open, UV-B radiation overexposure.

**GROSS:** Received in formalin is one frog to 5 cm. in greatest dimension that is processed in three blocks following appropriate decalcification of blocks #2-3.

**MICROSCOPIC:** **Intestine:** The small intestine contains numerous ascarid-like nematodes (probable pinworms). **Skin:** Skin of the dorsal skull has extensive ulceration and exfoliation of epithelial cells subtended by zones of mixed inflammation and resorption of bone in the calvarium. **Kidney:** Low numbers of tubules are dilated. The following tissues are histologically within normal limits: central nervous system, ears, eyes, oral and nasal cavities, thymus, pancreas, ovary, oviduct, larynx, stomach, esophagus, liver, and heart.

**HISTOPATHOLOGIC DIAGNOSIS:**

1. Severe ulcerative dermatitis with bone resorption, dorsum of skull.
2. Renal tubular dilatation.
3. Intestinal nematodiasis (pinworms).

**COMMENT:** Histologic findings corroborate the clinical suspicions. The morphologic features and distribution of the lesion over the skull are most consistent with chronic dorsal irritation, as might occur with solar or thermal radiation, irritation from a caustic mist, or other localized trauma. The nematodes were considered an incidental finding. The renal tubular dilatation is the early stage of tubular degeneration associated with skin diseases in amphibians. This frog was a female and was in excellent nutritional status.

E-mail: [REDACTED]

[REDACTED] ulcerative dorsal dermatitis.

Case No.: [REDACTED]

Obtained: NA, rec'd 11/08/18  
Reported: 11/15/18

Dr. Manny Garcia

Patient ID: [REDACTED] Frog #2  
(tank #1, FD)

University of California Santa Barbara  
Animal Resource Center  
Santa Barbara, CA 93106-5060

Account #: [REDACTED]  
Telephone: (805) 893-2333  
FAX #: 893-2005  
E-mail: manuel.garcia@ucsb.edu

**HISTORY:** This captive bred frog of unstated age and gender had abnormal skin condition that included depigmentation and hemorrhage of one week's duration.

**CLINICAL DIAGNOSIS:** Open, UV-B radiation overexposure.

**GROSS:** Received in formalin is one frog to 3 cm. in greatest dimension that is processed in four blocks following appropriate decalcification of blocks #3-4.

**MICROSCOPIC:** **Liver:** Moderate, periportal to random infiltrates of lymphocytes are noted. **Kidney:** Some of the tubules are dilated and lined by necrotic epithelium. **Intestine:** Numerous pinworms are in the lumen. **Skin:** Skin of the dorsal skull has extensive ulceration and exfoliation of epithelial cells subtended by zones of mixed inflammation and resorption of bone in the calvarium. The following tissues are histologically within normal limits: musculoskeletal system, central nervous system, ears, eyes, oral and nasal cavities, stomach, adipose, lung, thymus, heart, and ovary.

**HISTOPATHOLOGIC DIAGNOSIS:**

1. Severe ulcerative dermatitis with bone resorption, dorsum of skull.
2. Acute renal tubular necrosis.
3. Intestinal nematodiasis (pinworms).
4. Moderate, periportal to random, lymphocytic hepatitis.

**COMMENT:** Histologic findings are as seen in a conspecific submitted at the same time. The skin lesion is likely due to some form of solar or thermal irritation or other form of trauma. The renal tubular necrosis is a secondary event associated with the skin lesion. This frog also had hepatitis possibly related to sepsis associated with the skin lesion or an ascending inflammatory process of the biliary tree. The frog was in excellent nutritional status and was a female.

E-mail: [REDACTED]

ulcerative dorsal dermatitis, renal tubular necrosis, hepatitis.

Reviewed by:  
[Signature] 11/15/18  
Initials/Date

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 11/2/18	Animal ID: NA	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: [REDACTED]	Strain/Sex:
Investigator: [REDACTED]	Lab Contact: [REDACTED]	Phone No.:

Observations/Comments:

2 FDIC

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Clinical Call Submitted By (Name/Date): MG 11/2/18



# Veterinary Clinical Call Record

(Continuation Sheet)



Protocol No.:	Species:	Page No.:
Surgical Procedure:	Surgery Date:	Pre-Surgery BW:

Date	Time	Observations/Treatment	Initials
11/2/18	1314	<p>ON RP REPORTED ABN FINDINGS IN SOME OF HER FROGS (SEE EMAIL).</p> <p>ON TODAY SHE REPORTED TH/ST 2 FROGS WERE FOUND DEAD IN THEIR TANK (SAME ENCLOSURE, BUT FROGS IN OTHER TANKS MAY BE AFFECTED)</p> <p>A) OPEN</p> <p>P) SUBMIT CARCASS OF FD ANIMAL FOR DIAGNOSTIC PURPOSE</p> <p>RP INITIATED HOUSING CHANGES</p> <p>- NEW ENCLOSURE, NO UV-B RADIATION</p>	
11/6/18	1328	Two frogs sent to [REDACTED]	[REDACTED]
11/14/18	901	<p>REMAINING FROGS MOVED TO NEW ENCLOSURES, DISCON. UV-B LIGHT. &amp; 3 COMPLETED 1-WK COURSE OF CIPRO (10 mg/L BATH, 6h/d x 7)</p> <p>RP REPORTS FROGS ARE EATING WELL, ACTIVE, BUT DEPIG SKIN REMAINS</p> <p>P) REV ON THURS.</p>	
11/15/18	1421	<p>REMAINING FROGS (6) SINGLY-HOUSED. SKIN LESIONS HEALED OR HEALING NICELY. GOOD BODY CONDITION. NORMAL BEHAVIOR</p> <p>P) CONT. CIPRO BATH TX</p> <p>REV ON 11/24</p>	
11/19/18	1408	<p>DOING WELL, ONLY 2 FROGS HAVE NOT COMPLETELY HEALED</p> <p>P) DIC CIPRO BATH</p> <p>CONT. MONITORING</p>	
11/29/18	1414	<p>1 OF 2 - FDIC. 2nd CONT. TX CIPRO BATH</p>	



# Veterinary Clinical Call Record

(Continuation Sheet)

Protocol No.: 	Species: 	Page No.: 2
Surgical Procedure:	Surgery Date:	Pre-Sx Body Weight:

[illegible]

From: Manny Garcia [manuel.garcia@ucsb.edu](mailto:manuel.garcia@ucsb.edu)  
Subject: Re: Frog  
Date: November 2, 2018 at 1:57 PM  
To: [REDACTED]  
Cc: [REDACTED]

I've examined the carcass that you dropped off, and we'll send it off to the path lab on Monday.

This does not appear to be a rostral abrasion. The skin is intact, although there is evidence of depigmentation, and hemorrhaging. UV-B radiation is a possibility. Because the skin is such an important defensive barrier in amphibians, opportunistic bacterial infections will be our greatest concern when the skin is damaged. I would recommend that you provide topical antibiotics (by immersion) until the skin has healed. You can use Ciprofloxacin for this treatment - 10 mg/L for a 6 hr bath once a day for 7 days. We should have some Ciprofloxacin in the ARC. I'll head over in a few to check, and can drop it off for you.

Thanks  
Manny

On Nov 2, 2018, at 11:24 AM, [REDACTED] wrote:

Hi Manny,

I wanted to let you know that 2 frogs died overnight- they are being fixed in formalin now. I did turn off the UV lights yesterday.

The 2 frogs were in the same tank- the one furthest from the window (likely exposed to the most UV).

I have re-arranged the tanks in a U shape around the windows.

Here is the response from [REDACTED]

Hey [REDACTED]

*That looks like an abrasion that is infected. Often times called nose rub because it is most common in animals that are attempting to escape. Looking at your enclosure. Do you have glass tops under that screen or is it just the screen tops? Is there anything abrasive in your vivarium?*

*If you have any other questions please let us know.*

*Thank you*

[REDACTED]

[REDACTED]

To answer their questions, there isn't anything abrasive in the tanks. The frogs in the tanks by the window are fine- and I've never seen the animals try to escape. I talked to [REDACTED] at the [REDACTED] and he is going to get me 3 new tanks by the end of the day today- but I still need to purchase soil and plants for those.

Let me know if you have any other questions.

[REDACTED]

On Thu, Nov 1, 2018 at 11:42 AM Manny Garcia <[manuel.garcia@ucsb.edu](mailto:manuel.garcia@ucsb.edu)> wrote:

Hi [REDACTED]

Erosions or ulcerations of the skin caused by ultraviolet B radiation have been reported in newts, and it's possible

that a similar problem is occurring here. Less likely, but also possible, is an opportunistic bacterial or fungal dermatitis, but at least in the case of the former, these are usually seen on the tips of the nose (i.e., more rostral than depicted in your photo).

If it was due to UV-B radiation, and a secondary bacterial infection doesn't develop, then the problem should resolve on its own now that the UV lights are turned off. Make sure that the frogs are eating well, as poor nutrition or additional stress will increase the likelihood that they'll develop a bacterial dermatitis or that it will worsen.

Thanks  
Manny

On Nov 1, 2018, at 11:00 AM, [REDACTED] wrote:

Hi [REDACTED] and Manny,

This morning I noticed an odd coloration on the top of their heads (1st picture attached)- but only for the 3 tanks under the UV light (with 12:12 hr light:dark cycles). The 2 tanks by the windows- the animals looked fine (2nd picture attached).

I decided to turn off the UV lights. I don't think they are necessary for adult frogs, but more important for tadpole growth.

I also contacted [REDACTED] (the vendor) this morning that has animal husbandry help/services to see what they say.

Let me know what you think,  
[REDACTED]

<IMG\_8117.JPG>

<UNADJUSTEDNONRAW\_thumb\_2587.jpg>

[REDACTED]  
University of California, Santa Barbara  
[REDACTED]

Postdoctoral research associate  
[REDACTED]  
[REDACTED]

[Professional Website](#)

[Google Scholar](#)

[Twitter](#)

Pronouns: She/her/hers

[REDACTED]  
[REDACTED]  
University of California, Santa Barbara  
[REDACTED]

Postdoctoral research associate  
[REDACTED]  
[REDACTED]

[Professional Website](#)

[Google Scholar](#)

Case No.: [REDACTED]

Obtained: NA, rec'd 11/28/18  
Reported: 12/04/18

Dr. Manny Garcia  
University of California Santa Barbara  
Animal Resource Center  
Santa Barbara, CA 93106-5060

Patient ID: [REDACTED] #NM12  
Account #: [REDACTED]  
Telephone: (805) 893-2333  
FAX #: 893-2005  
E-mail: manuel.garcia@ucsb.edu

**HISTORY:** This wild caught [REDACTED] was found dead in its enclosure and had no signs of illness prior to death. This is the second animal from the colony that has died over the past month. Dietary changes were recently instituted.

**CLINICAL DIAGNOSIS:** Open, maladaptation, malnutrition.

**GROSS:** Received in formalin is one [REDACTED] to 3 cm. in greatest dimension that is processed in one block at three different levels.

**MICROSCOPIC:** **Kidney:** Numerous tubules are dilated and contain necrotic cellular debris or are lined by necrotic epithelium. **Skin:** Skin of the tail is ulcerated and the ulcerated surface lined by bacteria. Edema is present in the underlying dermis. **Adipose:** Adipose stores are severely atrophic. The following tissues are histologically within normal limits: alimentary tract, musculoskeletal system, central nervous system, ears, eyes, oral and nasal cavities, gallbladder, liver, and lung.

**HISTOPATHOLOGIC DIAGNOSIS:**

1. Marked atrophy of fat.
2. Acute epidermal ulceration with bacterial colonization.
3. Acute renal tubular necrosis.

**COMMENT:** Histologic changes confirm the clinical suspicion. This animal was emaciated. It had developed acute epidermal ulceration with bacterial colonization, a lesion that was likely precipitated by stress. As is common with amphibians, skin lesions of this nature frequently are associated with acute renal tubular necrosis, as in this case.

E-mail: [REDACTED]

[REDACTED] inanition, epidermal ulceration, renal tubular necrosis.

Reviewed by:  
[Signature] 12/5/18  
Initials/Date

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 11/13/18	Animal ID: NM12 & [REDACTED] 450	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: [REDACTED]	Strain/Sex:
Investigator: [REDACTED] / GARCIA	Lab Contact: [REDACTED]	Phone No.:

Observations/Comments:

NM12 - FDIC

[REDACTED] 450 - SUN VERSION

Clinical Call Submitted By (Name/Date): MG 11/13/18



## (Continuation Sheet)

<b>Protocol No.:</b>	<b>Species:</b>	<b>Page No.:</b>
<b>Surgical Procedure:</b>	<b>Surgery Date:</b>	<b>Pre-Surgery BW:</b>

Date	Time	Observations/Treatment	Initials
11/13/18	1544	SICK (██████ H50) & FD ██████ (NM12) REPORTED BY RP ON 11/10 EXAMINED CARCASS OF NM12: EMACIATED ██████. IT LIKELY DID NOT / COULD NOT ADAPT TO CAPTIVITY. DID NOT OBSERVE ANY OBVIOUS LESIONS. DO NOT SUSPECT AN INFX DZ OF COUNTY HEALTH SIG. ██████ H50 - SWELLING AROUND BASE OF NECK. SMOOTH MASS NO ULCERATION OF NECROSIS SUSPECT SQUAMOUS METAPLASIA OR HYPERPLASTIC/NEOPLASTIC LESION OF EPIDERMAL/INT. EG. ORIGIN P) NM12 - HISTOPATH ██████ H50 - INVESTIGATE ALT DIET. VERIFY NEEDED. SOURCE OF VIT A IN CRICKET GUT LOAD	
12/7/18	1431	██████ H50 - NO OBVIOUS SWELLING DIETARY ΔS HAVE IMPROVED/RESOL. THE NUTRITIONAL IMBALANCE NM12 - SEE PATH REPORT. ANIMAL WAS UNABLE TO ADAPT TO CAPTIVE ENVIR.	M CS

[REDACTED] death

---

From: [REDACTED]

Saturday, Nov 10, 6:51 PM

To: **Manny The Uc Vet** | manuel.garcia@ucsb.edu

Hi Manny,

Here is the information on the deceased [REDACTED]

catalog ID: NM12, species: [REDACTED], wild caught

Not sure of the cause of death. That [REDACTED] has been pretty healthy up to this point.

[REDACTED] 450 is showing a some weird symptom. There seems to be a hard, half-ring at the base of its neck. Maybe you can check on this Monday.

Thank you,

[REDACTED]

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FINAL REPORT OF LABORATORY EXAMINATION

Case #

Received: 11/29/2018  
Completed: 12/13/2018

Submitted By

Manny Garcia  
University of California-Santa Barbara  
Animal Resource Center

Phone: 805-893-7344  
Fax: 805-893-2005  
Email: manuel.garcia@ucsb.edu

Santa Barbara, CA 93106-5061

Specimen Description

Species:  
Breed/Strain:  
Number of Specimens/Animals: 3

Purchase Order #:

Client ID	Species
A	
B	
C	

Reviewed by:  
1/3/19  
Initials/Date

Services/Tests Performed: Histopathology Services

Histopathologic evaluation for: heart, intestine, liver, lungs, muscle, skin

**Summary:** Frogs were from a recent shipment that experienced very low temperatures in transit with several animals found dead upon arrival. The submitted frogs were found dead approximately two weeks after arrival. Clinically the frogs were reported to have fair appetite and non-specific signs (skin slough and lethargy). Frogs were submitted in formalin for diagnostic evaluation.

There is extensive multifocal epidermal ulceration with numerous intralesional Gram-negative bacilli and occasional branching fungal hyphae (Periodic Acid Schiff stain pending for confirmation) in all frogs examined. These findings are suggestive of opportunistic bacterial and fungal infection consistent with the case history of shipping stress and clinical observation of sloughing skin. Please see report for additional details.

## HISTOPATHOLOGY

heart	A	B	C
lesions	-	-	-

Intestine	A	B	C
no significant lesions; however, postmortem autolysis precludes satisfactory evaluation of tissue(s)	+	+	+

kidney	A	B	C
no significant lesions; however, small areas of mixed bacterial populations present within the tissue parenchyma with no inflammatory response (consistent with animals that are found dead).	+	+	+

liver	A	B	C
no significant lesions; however, small areas of mixed bacterial populations present within the tissue parenchyma with no inflammatory response (consistent with animals that are found dead).	+	+	+

lungs	A	B	C
lesions	-	-	-

muscle	A	B	C
lesions	-	-	-

skin	A	B	C
Multifocally, the epidermis is extensively ulcerated and replaced by eosinophilic cellular debris, inflammatory cells, and numerous intralesional Gram-negative bacilli. Occasionally within epidermal lesions and extending into the underlying dermis are narrow, branching fungal hyphae (pending confirmation by Periodic Acid Schiff stain).	+	+	+

ADDENDUM TO FINAL REPORT OF LABORATORY EXAMINATION

Case #

Received: 11/29/2018

Completed: 12/13/2018

Addendum Dated: 12/18/2018

Submitted By

Manny Garcia  
University of California-Santa Barbara  
Animal Resource Center

Phone: 805-893-7344  
Fax: 805-893-2005  
Email: manuel.garcia@ucsb.edu

Santa Barbara, CA 93106-5061

HISTOPATHOLOGY

skln	A	B	C
Occasionally within epidermal lesions and extending into the underlying dermis and glands are narrow, septate, branching fungal hyphae that stain faintly positive with PAS stain.	+	+	+

**Comments:** Occasional, multifocal areas of branching, septate fungal hyphae were confirmed by positive staining for Periodic Acid Schiff (PAS) stain. Fungal hyphae are present in skin samples from all frogs examined. Please see addendum to diagnostic report for additional details.



FINAL REPORT OF LABORATORY EXAMINATION

Case #

Received: 1/8/2019  
Completed: 1/15/2019

Submitted By

Manny Garcia  
University of California-Santa Barbara  
Animal Resource Center

Phone: 805-893-7344  
Fax: 805-893-2005  
Email: manuel.garcia@ucsb.edu

Santa Barbara, CA 93106-5061

Specimen Description

Species:  
Breed/Strain:  
Number of Specimens/Animals: 1

Purchase Order #:

Client ID	Strain /Breed	Sex
Tank		F

Services/Tests Performed: Histopathology Services

Histopathologic evaluation for: heart, intestinal tract, kidney, liver, lung, ovary, skin, stomach

**Summary:** On gross examination, this frog had multifocal graying of the skin on the ventrum, flank and limbs. In the skin, there were multifocal ulcerations with colonies of Gram-negative rod-shaped bacteria within necrotic debris. This lesion may represent a primary bacterial infection (Gram-negative rods associated with "red-leg syndrome") or secondary invasion of abraded skin. No evidence of red-leg like septicemia were noted in other tissues. This frog had a focal gastric ulcer. No parasites or fungal organisms were identified. Please see the report for details.

Reviewed by:

1/15/19  
Initials/Date

## HISTOPATHOLOGY

Animal: Tank 3	
heart	no significant lesions
intestinal tract	no significant lesions
kidney	no significant lesions
liver	no significant lesions
lung	no significant lesions
ovary	no significant lesions
skin	Multiple sections of skin were evaluated from the ventrum, flank and limbs. There is multifocal acute necrosis of the epidermis (ulceration) with sloughing. On Gram-stained sections multifocally there are Gram-negative rod-shaped bacteria within the necrotic tissue and rarely in adjacent intact epidermis. No fungal organisms or parasites were identified.
stomach	There is a moderate focal ulceration with mononuclear cell infiltrates and submucosal edema.

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 1/3/19	Animal ID: NA	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: [REDACTED]	Strain/Sex: BOTH
Investigator: [REDACTED]	Lab Contact:	Phone No.:

Observations/Comments:

SEVERAL FPIC IN MULT. TANKS  
ALL FROM SAME SHIPMENT, WHICH  
SUFFERED SEVERE SHIPPING STRESS  
& HYPOTHERMIA  
♀ TANK 3 - 1 FD 1/1/19  
♀ TANK 7 - 1 FB 12/22/18; 1 FD 12/30/18  
♂ TANK 8 - 1 FD 12/27/18, 12/28/18, 12/30/18  
♂ TANK 9 - 1 FD 12/31/18, 1/1/19  
TOTAL 8 FD

Clinical Call Submitted By (Name/Date): [Signature] 1/3/19

# Veterinary Clinical Call Record

(Continuation Sheet)

Protocol No.:	Species:	Page No.:
Surgical Procedure:	Surgery Date:	Pre-Surgery BW:

Date	Time	Observations/Treatment	Initials
1/3/18	9/29	OBSERVED FOLLOWING SKIN LESIONS ON FROGS IN TANKS 3, 7, 9 DARK BODY COLORATION & MULT. TAN/WHITE FOCI (SKIN ULCERATIONS) 1 ♀ FROG IN TANK 3 WAS ALSO HYPEREMIC & EDEMATOUS A) OPPORTUNISTIC BACT. INFX MOST LIKELY GIVEN HX & ABSENCE OF WATER QUAL PROBLEM. P) CONTACT RP/PI Δ SM TANKS & CONSOLIDATE SICK ANIMALS BAYTRIL 10mg/kg SC BID x 14	
1/3/19	1003	MODIFY TX PLAN TX - CIPRO BATH 10mg/L DAILY x 10d PUT SICK FROGS IN SM. MOUSE TUB SEPARATE BY SEX. DIWTE 3mg/ml CIPRO DROPS (2 ml) TO TANKS CONTAINING 600ml each REPLACE MED. WATER DAILY RETURN FROGS TO MAIN TANKS AFTER TX & AT END OF DAY	H
1/3/19	1052	WITH ♀ TANK 3 & LOSS OF RIGHTING REFLEX & SEVERE ULCERATIVE LESIONS P) SET PRESERVE CAPSULES IN FORMALIN & SUBMIT TO PATH LAB	H

1/1/19 1550 Sent to



# Veterinary Clinical Call Record

(Continuation Sheet)

Protocol No.:	Species:	Page No.: 2
Surgical Procedure:	Surgery Date:	Pre-Sx Body Weight:

Date	Time	Observations/Treatment	Initials
1/4/18 9	952	AT LEAST 1 FROG U ULCERATIVE SKIN LESION OR SLOUGHING FOUND IN TANKS 2, 3, 7 & 9 P) TREAT FROGS IN ALL 4 TANKS U CIPRO SM TANKS - 12L x 10mg/ml = 120mg LG TANKS - 13L x " = 130mg MAKE 10 mg/ml CIPRO STOCK SOLN. BY DISSOLVING 2 x 250mg TABLETS IN 70ml OF STERILE WATER IN A 50ml CONICAL TUBE. MAKE FRESH EA. DAY DOSING: SM TANK = 12 ml SID LG TANK = 13 ml SID TURN OFF WATER @ DOSING & TURN BACK ON AFTER ~ 4 hrs	
1/7/19	1428	1 ♀ FROG IN TANK #7 - SLOUGHING SKIN. FROGS IN THE OTHER TANKS - NO ABN NOTED TANK <del>W/</del> WATER EXCHANGE RATE FOR [REDACTED] SYSTEM ↑ FREQ TX REMOVE RESIDUAL ANTIBIOTIC. WATER QUAL. WNL P) CONT TX PUSH AS-IS	MS
1/7/19	1559	Frog from tank 3 sent to [REDACTED]	
1/11/19	854	2 ♀ FROGS IN TANK #7 - SLOUGHING SKIN. ALL FROGS IN THE OTHER TANKS LOOK FINE. P) CONT TX FOR FROGS IN TANK #7 ONLY. RE-✓ ON MONDAY REPLACE CARBON FILTER	MS



## (Continuation Sheet)

Protocol No.:	Species:	Page No.: 3
Surgical Procedure:	Surgery Date:	Pre-Surgery BW:

[illegible]

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 1/15/19	Animal ID: [REDACTED]	Protocol No.: [REDACTED]
Location: [REDACTED] - Rack (6 sink on heat right)	Species: Mouse	Strain/Sex: α M-11 Type 1 (F)
Investigator: [REDACTED]	Lab Contact: —	Phone No.: —

Observations/Comments:

Recently weaned (1/10/19) - not eating / drinking.  
Underdeveloped, weak, thin + lethargic.  
OFFERED diags, wet food + placed on heat.

Clinical Call Submitted By (Name/Date):

[REDACTED]

1/15/19

000000

44

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 3/12/19	Animal ID: A29.1	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: RAST	Strain/Sex: [REDACTED]
Investigator: [REDACTED]	Lab Contact:	Phone No.:

Observations/Comments: FDIC

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Clinical Call Submitted By (Name/Date): GA 3/12/19

# Veterinary Clinical Call Record

(Continuation Sheet)

<b>Protocol No.:</b>	<b>Species:</b>	<b>Page No.:</b>
<b>Surgical Procedure:</b>	<b>Surgery Date:</b>	<b>Pre-Sx Body Weight:</b>

[illegible]



UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 3/19/19	Animal ID: T522M	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: [REDACTED]	Strain/Sex: 07
Investigator: [REDACTED]	Lab Contact:	Phone No.:

Observations/Comments:

FDIC

Clinical Call Submitted By (Name/Date):

MG

3/19/19

# Veterinary Clinical Call Record

(Continuation Sheet)

Protocol No.:	Species:	Page No.:
Surgical Procedure:	Surgery Date:	Pre-Surgery BW:

Date	Time	Observations/Treatment	Initials
3/19/A	1250	<p>NECROPSY FINDINGS:</p> <ul style="list-style-type: none"> <li>- NLGD LIVER <math>\sim</math> LG (45mm)</li> <li>MULTI-FOCAL WHITE RAISED MASSES. 2 OF WHICH WERE ADHERED TO THE DIAPHRAGM ON CT-SURFACE ONE OF THE MASSES CONTAINED A THICK WHITE-GREEN VISCOUS MATERIAL</li> <li>- PLEURAL CAVITY - ABUNDANT CLEAR AMBER FLUID</li> <li>- LUNGS - ATLECTIC</li> </ul> <p>A) OPEN, SUSPECT HEPATIC NEOPLASIA. R/O INFECTION</p> <p>DZ OF COLONY HEALTH SIG.</p> <p>P) HISTOPATH</p> <p>AEROBIC BACT. C/S</p>	

Patient Info:  
Name: T522m  
Chart No: N  
Owner: D1137  
Doctor: Garcia

Species: Rodent  
Breed: Rat  
Age:  
Sex: M

Hospital:  
University of California - Santa  
Barbara  
Attn: Animal Resource  
Santa Barbara, CA 93106

Lab:

Reported: 03/22/19 11:56  
Received: 03/20/19

Accession No.	Doctor		Owner		Pet Name		
	Garcia		D1137		T522m		
Test	Results	Adult Reference Range			L	Normal	H
Culture, Aerobic	#1	#2	#3	#4	#5		

SOURCE Swab

#### HEPATIC MASS

Preliminary #1 03/21/2019

MODERATE GROWTH OF POTENTIAL PATHOGENS TO BE IDENTIFIED.

Final Report 03/22/2019


Organism # 1 **Staphylococcus**  
Aureus

MODERATE GROWTH

Small Herbivore KB Sensi	#1	#2	#3	#4	#5
AMIKACIN	S				
CEFOTAXIME	S				
CEFTIOFUR	S				
CHLORAMPHENICOL	S				
DOXYCYCLINE	S				
ENROFLOXACIN	S				
GENTAMICIN	S				
Marbofloxacin	S				
ORBIFLOXACIN	S				
PENICILLIN	R				
TETRACYCLINE	S				
TMP / SULFA	S				

Conventional & accepted microbiology procedure is to use one sample per culture. We have inoculated separate culture media, under different accessions, from the samples procured from this patient in order to optimize isolation of potential pathogens.

Reviewed by:

 3/22/19

Initials/Date

Patient Info:  
Name: T522m  
Chart No: N  
Owner: D1137  
Doctor: Garcia

Species: Rodent  
Breed: Rat  
Age:  
Sex: M

Hospital:  
University of California - Santa  
Barbara  
Attn: Animal Resource  
Santa Barbara, CA 93106

Lab:

Reported: 03/23/19 08:08  
Received: 03/20/19

Accession No.	Doctor	Owner	Pet Name		
	Garcia	D1137	T522m		
Test	Results	Adult Reference Range	L	Normal	H
Culture, Aerobic	#1	#2	#3	#4	#5

SOURCE Fluid

#### PLEURAL FLUID

Preliminary #1 03/21/2019

NO GROWTH ON DIRECT PLATING MEDIA AND BROTH CULTURE  
IN 24 HOURS.

Preliminary #2 03/22/2019

NO GROWTH ON DIRECT PLATING MEDIA AND BROTH CULTURE  
IN 48 HOURS.

Final Report 03/23/2019

NO GROWTH ON DIRECT PLATING MEDIA AND BROTH CULTURE IN  
72 HOURS.

Conventional & accepted microbiology procedure is to use one sample  
per culture. We have inoculated separate culture media, under  
different accessions, from the samples procured from this patient in  
order to optimize isolation of potential pathogens.

Reviewed by:

3/25/19

Initials/Date

FINAL REPORT OF LABORATORY EXAMINATION

Received: 3/22/2019

Completed: 4/1/2019

Submitted By

Manny Garcia  
University of California-Santa Barbara  
Animal Resource Center

Phone: 805-893-7344  
Fax: 805-893-2005  
Email: manuel.garcia@ucsb.edu

Santa Barbara, CA 93106-5061

Specimen Description

Species: rat

Purchase Order #: [REDACTED]

Breed/Strain: [REDACTED]

Number of Specimens/Animals: 1

Client ID	Species	Strain /Breed	Sex
T522M	rat	[REDACTED]	M

Services/Tests Performed: Histopathology Services (1)

Histopathologic evaluation for: heart, liver, liver (Gram), lung

**Summary:** This animal had large coalescing abscesses with intralesional Gram positive cocci in the liver. If any other animals in the colony are found with liver lesions, culture of the foci would be recommended. Please see the report for details.

Reviewed by:

EG 4/1/19

Initials/Date



## HISTOPATHOLOGY

Animal: T522M	
heart	The heart chambers have increased numbers of inflammatory cells trapped within fibrin aggregates.
liver	The liver sections have large coalescing abscesses with intralesional bacteria. Other liver changes include large areas of hepatocellular necrosis, single cell necrosis, hemorrhage, fibrosis, oval cell hyperplasia, inflammatory infiltrate, occasional multinucleated giant cells and sinusoid congestion. Large and small clear cytoplasmic vacuoles, consistent with lipid droplets, are noted in scattered viable hepatocytes.
liver (Gram)	Numerous colonies of Gram positive cocci are noted within the liver abscesses.
lung	insufficient inflation of the lungs precludes accurate evaluation

Reviewed by  
[Signature]  
Initialed/Date

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 4/1/19	Animal ID: 5HT 1	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: RAT	Strain/Sex: SD ♂
Investigator: [REDACTED]	Lab Contact:	Phone No.:

Observations/Comments:

FDIC

Clinical Call Submitted By (Name/Date):

MG 4/1/19

## (Continuation Sheet)

Protocol No.:	Species:	Page No.: 17
Surgical Procedure: CRANIOT. + IMP.	Surgery Date: 3/27/19	Pre-Surgery BW:

[illegible]

From: [REDACTED]  
Subject: Re: found dead animal  
Date: April 1, 2019 at 2:39 PM  
To: Manny Garcia manuel.garcia@ucsb.edu, [REDACTED]  
Cc: [REDACTED]

Hi Manny,

Thank you for letting me know. I will check in with [REDACTED] and try sure to sit in on his next surgery.

On 4/1/2019 1:43 PM, Manny Garcia wrote:

One of your animals was found dead in their cage by the ARC staff. The details of this animal mortality are provided below. We are not generally aware of the experimental treatments or induced genetic mutations that your animals receive; therefore, we are not able to determine if they may have contributed to the death of the animal. We depend on your feedback to be able to determine if the mortality is expected, or unexpected and of significance (e.g., an unexpected adverse effect of the treatment). Please let us know if this animal mortality was unusual or unexpected and of significance.

Details:

SD rat #5HT1 was found dead in its cage this morning. On necropsy there was evidence of marked intracranial hemorrhaging. This animal would have appeared lethargic or inactive on post-op observations.

[REDACTED] who are you working with for direct and supervised training on this new surgical procedure? Have you had any problems, and do you need assistance?

Thanks  
Manny

--  
Manuel (Manny) A. Garcia  
Campus Veterinarian  
Director, Animal Resource Center  
Cell: (805) 451-5931  
Office: (805) 893-7344

**UC SANTA BARBARA**

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 5/21/19	Animal ID: NA	Protocol No.:
Location: [REDACTED]	Species: [REDACTED]	Strain/Sex:
Investigator: [REDACTED]	Lab Contact:	Phone No.:

Observations/Comments:

FDIC

Clinical Call Submitted By (Name/Date): W 5/21/19

# Veterinary Clinical Call Record

(Continuation Sheet)

Protocol No.:	Species:	Page No.:
Surgical Procedure:	Surgery Date:	Pre-Surgery BW:

[illegible]



Case No.: [REDACTED]

Obtained: NA, rec'd 05/23/19

Reported: 05/30/19

Dr. Manny Garcia  
University of California Santa Barbara  
Animal Resource Center  
Santa Barbara, CA 93106-5060

Patient ID: [REDACTED] (no ID)  
Account #: [REDACTED]  
Telephone: (805) 893-2333  
FAX #: 893-2005  
E-mail: manuel.garcia@ucsb.edu

**HISTORY:** This [REDACTED] is from a collection in which chytridiomycosis has been diagnosed.

**CLINICAL DIAGNOSIS:** Open.

**GROSS:** Received in formalin is one [REDACTED] to 9 cm. in greatest dimension that is processed in eight blocks following appropriate decalcification of blocks #5-8.

**MICROSCOPIC: Skin:** Skin of the toes, ventral abdomen, and ventral mandible have mild hyperkeratosis and sloughing of the keratin layers. The keratin layers frequently contain developing stages of chytrids. Plaques or discs are not seen. **Kidney:** Moderate tubular necrosis is noted, and some of the tubules are dilated and contain proteinaceous material or necrotic cellular debris.

**Peripheral blood:** Circulating erythrocytes have smudged intranuclear inclusions (probable euthanasia artifact). The following tissues are histologically within normal limits: musculoskeletal system, central nervous system, ears, eyes, oral and nasal cavities, pituitary, alimentary tract, ovary, oviduct, adipose, liver, heart, gallbladder, and lung.

**HISTOPATHOLOGIC DIAGNOSIS:**

1. Hyperkeratosis with intralesional chytrids.
2. Moderate renal tubular necrosis.

**COMMENT:** Histologic findings are classic for chytridiomycosis, particularly *Batrachochytrium dendrobatidis*. The plaque or disc-like formations associated with BSAL are not represented. As is typical of amphibians with extensive cutaneous lesions, this animal also had acute renal tubular necrosis. It is unclear from the history if this animal was euthanized or if it died, but there are inclusions in the erythrocytes that may represent artifact associated with euthanasia solution. This [REDACTED] was a female and was in good nutritional status.

E-mail: [REDACTED]

[REDACTED] chytridiomycosis.

Reviewed by:

 5/31/19

Initials/Date

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 5/22/19	Animal ID: NA	Protocol No. [REDACTED]
Location: [REDACTED]	Species: [REDACTED]	Strain/Sex:
Investigator: [REDACTED]	Lab Contact:	Phone No.:

Observations/Comments:

FDIC REPORTED BY UGS [REDACTED] @ 4:43 PM  
ON 5/21/19

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Clinical Call Submitted By (Name/Date): MS 5/22/19

## (Continuation Sheet)

████████████████████

5

From: [REDACTED]  
Subject: Re: [REDACTED]  
Date: May 21, 2019 at 4:57 PM  
To: Manny Garcia mannydvm@ucsb.edu

Manny,

I mentioned to [REDACTED] last week in the lab that it hadn't been eating well when the [REDACTED] were being swabbed for Bd. I realize that I should have sent out an email about it in addition. All the other [REDACTED] and [REDACTED] are eating as normal.

[REDACTED]

On Tue, May 21, 2019, 4:51 PM Manny Garcia <mannydvm@ucsb.edu> wrote:

How come it wasn't reported that it hadn't been eating? Are there any other [REDACTED] that are not eating? I'll go and collect the carcass.

Thanks  
Manny

> On May 21, 2019, at 4:43 PM, [REDACTED] wrote:

>

> Hi Manny,

>

> When I went to change the bedding just now I noticed that the breeding female [REDACTED] is dead. It was the one that was housed with the other [REDACTED] that died, so I am thinking it probably got infected as it hasn't been eating very well the past few weeks. I am hoping none of the others turn out to be infected as well. I am leaving it in the fridge in its tupperware for further inspection.

>

> Best,

>

> [REDACTED]

From: [REDACTED]  
Subject: Re: [REDACTED]  
Date: May 21, 2019 at 5:29 PM  
To: Manny Garcia [mannydvm@ucsb.edu](mailto:mannydvm@ucsb.edu)  
Cc: [REDACTED], [REDACTED]

Hi all,

I am very shocked to hear it has died. I believe this was the male [REDACTED] I took care of the [REDACTED] fed the [REDACTED] Thursday and Saturday I believe (I'll have to check what I marked off).

From last Thursday, I thought it had ate all the crickets I fed it (5) because I didn't notice any dead ones when I changed the bedding on Saturday. When I checked on the [REDACTED] Sunday and Monday (just a visual check) nothing seemed out of the ordinary.

Hopefully we can figure out what caused this. Have any of the test results came back for Bsal or Bd?

Best,  
[REDACTED]

On Tue, May 21, 2019 at 4:51 PM Manny Garcia <[mannydvm@ucsb.edu](mailto:mannydvm@ucsb.edu)> wrote:

How come it wasn't reported that it hadn't been eating? Are there any other [REDACTED] that are not eating? I'll go and collect the carcass.

Thanks  
Manny

> On May 21, 2019, at 4:43 PM, [REDACTED] wrote:

>

> Hi Manny,

>

> When I went to change the bedding just now I noticed that the breeding female [REDACTED] is dead. It was the one that was housed with the other [REDACTED] that died, so I am thinking it probably got infected as it hasn't been eating very well the past few weeks. I am hoping none of the others turn out to be infected as well. I am leaving it in the fridge in its tupperware for further inspection.

>

> Best,

>

> [REDACTED]

From: Manny Garcia [mannydvm@ucsb.edu](mailto:mannydvm@ucsb.edu)

Subject: Re: [REDACTED]

Date: May 21, 2019 at 5:27 PM

To: [REDACTED]

Cc: Stu Feinstein [feinstein@lifesci.ucsb.edu](mailto:feinstein@lifesci.ucsb.edu), [REDACTED]

This [REDACTED] had severe skin ulcerations and sloughing, which suggests that it too died of chytridiomycosis. I collected a skin swab, which I will send out tomorrow to the diagnostic lab. I saw no skin lesions on any of the other [REDACTED]

Please let me know right away if you notice any other [REDACTED] that is not eating, or not eating all its food, or has any skin sloughing. Please continue to carefully disinfect and change your gloves and disinfect your workstation before and after handling these animals so we do not spread this fungal agent to any uninfected animals.

Unfortunately, I'm not aware of any anti-fungal (itraconazole) treatment dose for this species. I will contact [REDACTED] for suggestion, if any.

Manny

Manuel (Manny) A. Garcia, DVM, PhD, DACLAM  
Campus Veterinarian  
Director, Animal Resource Center  
0105 BioEngineering Building  
University of California  
Santa Barbara, CA 93106-5061  
Office: (805) 893-7344  
Mobile: (805) 451-5931  
Email: [manuel.garcia@ucsb.edu](mailto:manuel.garcia@ucsb.edu)

On May 21, 2019, at 4:51 PM, Manny Garcia <[mannydvm@ucsb.edu](mailto:mannydvm@ucsb.edu)> wrote:

How come it wasn't reported that it hadn't been eating? Are there any other [REDACTED] that are not eating? I'll go and collect the carcass.

Thanks

Manny

On May 21, 2019, at 4:43 PM, [REDACTED] wrote

Hi Manny,

When I went to change the bedding just now I noticed that the breeding female [REDACTED] is dead. It was the one that was housed with the other [REDACTED] that died, so I am thinking it probably got infected as it hasn't been eating very well the past few weeks. I am hoping none of the others turn out to be infected as well. I am leaving it in the fridge in its tupperware for further inspection.

Best,

[REDACTED]



From: [REDACTED]  
Subject: Re: blotch spotted [REDACTED]  
Date: May 21, 2019 at 5:53 PM  
To: Manny Garcia mannydvm@ucsb.edu  
Cc: [REDACTED]

Hi Manny,

I'm suggesting that folks use lower itraconazole doses than have been published in the past (0.005 or 0.0025% rather than 0.01%). Based on feedback (all anecdotal) most [REDACTED] seem to tolerate itraconazole better than some of the anuran species. I always give the caveat that there could be species variation and idiosyncratic intolerance. But if you've got a clinical case I think itra is the best hope for turning it around. Papers attached go through treatment protocols.

If you are seeing ulcers I'm definitely more worried about Bsal chytridiomycosis rather than Bd...most [REDACTED] Bd is proliferative rather than ulcerative and I haven't seen ulcers often...even with secondary bacterial infections. Of course your ulcers could be something else entirely (we'll hope). Coverage for gram-negative bacteria would be good in addition to the itraconazole (some data suggests cause of death with Bsal could be secondary sepsis associated rather than osmotic).

If you have sloughing skin and there is enough to collect please include along with the swab sample on an ice pack (in a cryovial or a couple of zip lock bags).

Best,

[REDACTED]

[REDACTED]

---

From: Manny Garcia <mannydvm@ucsb.edu>  
Sent: Tuesday, May 21, 2019, 5:31:57 PM  
To: [REDACTED]  
Cc: [REDACTED]  
Subject: Re: blotch spotted [REDACTED]

Hi [REDACTED]  
do you have any recommendation on itraconazole dose and treatment for this species of [REDACTED] I just heard from the students that are caring for these [REDACTED] that the cage mate to this animal was not eating. When I examined it, I was clearly infected (severe and large ulcerations on the ventrum, and marked skin sloughing). I've collected a swab sample, and will have someone send it to your lab tomorrow.

Thanks  
Manny

On May 10, 2019, at 5:13 PM, [REDACTED] wrote:

Hi [REDACTED]

Nothing has been sent here yet. I just sent a different reply saying that I thought it was fine if you guys wanted to run the screen and if it were Bsal positive we'd be happy to help with verification that would likely be requested by regulatory folks (in an "accredited" diagnostic lab ect). Or if you guys want to send we can do it (it may be cheaper to do it "in-house").

Cheers,

[REDACTED]

[REDACTED]

---

From: [REDACTED]  
Sent: Friday, May 10, 2019 5:04:16 PM  
To: Manny Garcia; [REDACTED]  
Subject: Re: Fw: blotch spotted [REDACTED]

Hi everyone,  
I hadn't realized that you were already running qPCR for Bd and Bsal when I offered. I don't need to repeat your effort. Please just let me know

what you need.

Thanks,  
[REDACTED]

On 5/10/19 4:55 PM, Manny Garcia wrote:

F/1

Begin forwarded message:

From: Manny Garcia <mannydvm@ucsb.edu>

Subject: Re: blotch spotted [REDACTED]

Date: May 10, 2019 at 4:54:18 PM PDT

To: [REDACTED]

Cc: [REDACTED]

Hi [REDACTED]

[REDACTED] has requested to run the qPCR for Bd and Bsal in [REDACTED] lab. The graduate student working with these animals is coordinating the test with [REDACTED]. Would you like me to ask [REDACTED] if we can send you parallel samples?

Thanks

Manny

On May 10, 2019, at 4:22 PM, Fessler, [REDACTED] wrote:

Hi Manny,

Below is a link to our submission form. They usually let me know when any amphibian samples come in, but you can also include in the history section Attn: [REDACTED] and I'll watch them through the process. Otherwise just check the PCR box towards the middle of the form and write in "Bd and Bsal" either next to PCR or in the history section. Shipping addresses are at the top of the form.

[REDACTED]

Cheers,

[REDACTED]

[REDACTED]

---

From: [REDACTED]  
Sent: Thursday, May 9, 2019 4:18:03 PM  
To: Manny Garcia [REDACTED]  
Subject: Re: blotch spotted [REDACTED]

[REDACTED] is copied here

[REDACTED]

[REDACTED]

On Thu, May 9, 2019, 4:26 PM Manny Garcia <mannydvm@ucsb.edu> wrote:

Do you have [REDACTED] contact information at [REDACTED]? We have swabs that we use for routine chytrid screening in our X. tropicalis colony (different building and different technicians handling them). I'll try and get a sample up to [REDACTED] as soon as possible. I still need to figure out quarantine procedures here, and notify the lab, which is going to be difficult because the PI is not available.

Thanks for your help.

Manny

On May 9, 2019, at 12:57 PM [REDACTED] wrote:

try swabs, especially from the feet or medial aspects of the hind legs, although the lesion is more or less diffuse in the submitted animal. [REDACTED] is interested in the case, and [REDACTED] has the primers for both chytrids. I recommend you send the sample there. I will do the same with the block from this animal.

On Thu, May 9, 2019 at 3:13 PM Manny Garcia <mannydvm@ucsb.edu> wrote:

I don't have the tail in my lab. Please proceed with the PCR from the paraffin block. I'll try and arrange for testing of her cage mate. This was a breeding pair.

Thanks  
Manny

Sent from my iPhone

On May 9, 2019, at 12:06 [REDACTED] wrote:

the [REDACTED] dropped its tail prior to death. I didn't get the tail, so maybe that tissue is in the freezer? If not, we should proceed with PCR from the paraffin block. This animal has chytridiomycosis, most likely *C. dendrobatidis* (based on its native distribution), but we want to be sure it's not *Bsal*, which would be a first for U.S.

On Thu, May 9, 2019 at 3:03 PM Manny Garcia <mannydvm@ucsb.edu> wrote:

Hi [REDACTED]

No Bd results that I performed or know about. [REDACTED] is not available and I don't know if [REDACTED] has any Bd result. I can ask [REDACTED] grad student.

Manny

Sent from my iPhone

On May 9, 2019, at 11:56 [REDACTED] wrote:

Manny, do you have any chytrid PCR results for the salamander you submitted recently. The animal had no I.D. # Submitting vets are [REDACTED] Garcia.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



Itraconazole.pdf



Pathogenesis  
diagno...AP.pdf

Case No.: [REDACTED]

Obtained: NA, rec'd 06/06/19  
Reported: 06/13/19

Dr. Manny Garcia  
University of California Santa Barbara  
Animal Resource Center  
Santa Barbara, CA 93106-5060

Patient ID: Blacksmith Fish [REDACTED]  
Account #: [REDACTED]  
Telephone: (805) 893-2333  
FAX #: 893-2005  
E-mail: manuel.garcia@ucsb.edu

**HISTORY:** This wild caught fish has been in captivity in an open flow seawater tank and was identified with an unusual swimming pattern. There was no evidence of external trauma or edema, and the fish was able to maintain normal buoyancy but in lateral body position. The fish was isolated to a quarantine tank but was found dead the following morning.

**CLINICAL DIAGNOSIS:** Neurologic disease.

**GROSS:** Received in formalin are multiple tissues to 2 cm. in greatest dimension that are processed in four blocks.

**MICROSCOPIC:** **Brain:** A laminar focus of edema, glial cell necrosis, and focal spheroid formation are noted in the brain in what appears to be optic tectum. **Mesentery:** Large numbers of encysted nematodes are present within the mesentery. **Heart:** Mild lymphocytic inflammation is in the epicardium. **Adipose:** Adipose stores are markedly atrophic. **Stomach:** Transmural infiltrates of histiocytes, some with cytoplasmic pigment interpreted as iron are noted in the submucosal and muscular tunics, and a few microgranulomas are in the submucosa, one of which is oriented around a degenerative nematode. **Gill:** Mild atrophy of the secondary lamellae is noted, and a few of the filaments have some scarring. The following tissues are histologically within normal limits: swim bladder, intestine, pancreas, esophagus, large nerve, liver, spleen, pancreas, and conus arteriosus.

**HISTOPATHOLOGIC DIAGNOSIS:**


1. Laminar necrosis, brain.
2. Marked atrophy of fat.
3. Mesenteric nematodiasis.
4. Chronic transmural gastritis with nematode microgranulomas.

**COMMENT:** Histologic findings support the clinical observations. There is a focus of laminar necrosis in the brain possibly due to regional vascular insult, although thiamine deficiency can produce a similar lesion. This fish was emaciated, and this is likely due to a combination of maladaptation, stress, and heavy parasite burden. The gill atrophy in this case is likely due to hypoperfusion associated with underlying disease processes rather than suboptimal water quality.

E-mail: [REDACTED]

[REDACTED] laminar necrosis, inanition, mesenteric nematodiasis.

Reviewed by:

 6/13/19

Initials/Date



UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 01/3/19	Animal ID: NA	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: BUSHSMITH FISH	Strain/Sex:
Investigator: [REDACTED]	Lab Contact: [REDACTED]	Phone No.:

Observations/Comments:

[REDACTED] [REDACTED] SENT EMAIL ON  
5/29/19 ABOUT THE BUSHSMITH  
FISH "THAT IS SWIMMING VERY  
ODDLY"

Clinical Call Submitted By (Name/Date): [Signature] 5/ 0/3/19

## (Continuation Sheet)

Protocol No.: [REDACTED]	Species: BLACKSMITH	Page No.: <u>1</u>
Surgical Procedure: N/A	Surgery Date: <u>          </u>	Pre-Surgery BW: <u>          </u>

[illegible]

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 6/28/19	Animal ID:	Protocol No.: [REDACTED]
Location: [REDACTED] rack 1	Species: Mice	Strain/Sex: Male Rx/RB1/RB2/Rosa
Investigator: [REDACTED]	Lab Contact:	Phone No.:

Observations/Comments:

hunched, eyes sunken, dehydrated, extremely  
hyper active. Hydro pack possibly not rigged  
correctly

Clinical Call Submitted By (Name/Date): [REDACTED], 6/28/19

## (Continuation Sheet)

Protocol No.: [REDACTED]	Species: MOUSE	Page No.: 1
Surgical Procedure: NA	Surgery Date: —	Pre-Surgery BW: —

[illegible]

Reviewed by:

8/19/19

Initials/Date

Case No.: [REDACTED]

Obtained: NA, rec'd 07/12/19

Reported: 08/06/19

Dr. Manny Garcia

Patient ID: African Clawed Frog  
(no ID)

University of California Santa Barbara  
Animal Resource Center  
Santa Barbara, CA 93106-5060

Account #: [REDACTED]  
Telephone: (805) 893-2333  
FAX #: 893-2005  
E-mail: manuel.garcia@ucsb.edu

**HISTORY:** This frog of unstated age and gender was found dead in its cage.

**CLINICAL DIAGNOSIS:** Open.

**GROSS:** Received in formalin is one frog to 7 cm. in greatest dimension that is processed in seven blocks following appropriate decalcification of blocks #4-7.

**MICROSCOPIC:** **Lung:** The pulmonary parenchyma has marked hypertrophy and hyperplasia of respiratory epithelium with occasional syncytial cell formation, nuclear enlargement and edema, and possible rare intranuclear inclusions. Faveolae are filled with sloughed epithelial cells, necrotic cellular debris, and thin-walled clear structures (possible necrotic epithelial cells or fungi). **Liver:** Blood vessels are congested. **Trachea:** The mucosa is necrotic. **Skin:** Skin on the dorsum of the head has *Saprolegnia* overgrowth. A digit on the hind foot has loss of epidermis at the apex of P3. The following tissues are histologically within normal limits with the exception of advanced autolysis: musculoskeletal system, ears, eyes, central nervous system, oral and nasal cavities, heart, adipose, great vessels, intestine, ovary, and pancreas.

**HISTOPATHOLOGIC DIAGNOSIS:**

1. Severe proliferative pneumonia.
2. Tracheal mucosal necrosis.

**COMMENT:** Histologic findings are consistent with respiratory tract disease. Autolysis substantially impedes microscopic interpretation, and the etiologic agent is not apparent in the H & E stained slides. There are some possible fungi in some of the faveolae, and a fungal stain is pending in this regard. There are also some syncytia and rare intranuclear inclusions. These inclusions could be intranuclear edema, hypertrophied nucleoli, or possibly viral inclusions. I would be interested in any additional history that may be available for this case and if any other frogs have died.

**Addendum, 08/06/19:** A GMS stain is negative for fungal elements in the lung. If additional frogs become clinically morbid, you may want to consider euthanasia with immediate necropsy and formalin fixation to optimize histologic examination. You may also want to freeze a set of tissues, particularly lung, for future reference pending results of histologic examination. I have some concerns that the pulmonary lesion could have a viral component.

E-mail: [REDACTED] proliferative bronchointerstitial pneumonia.



UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 7/10/19	Animal ID: N/A	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: SNELL SHARK	Strain/Sex:
Investigator: [REDACTED]	Lab Contact: [REDACTED]	Phone No.:

Observations/Comments: FDIC - ON 7/8/19

REPORT OF ANIMAL MORTALITY &  
Hx ARE PROVIDED IN ATTACHED  
EMAIL.

Clinical Call Submitted By (Name/Date):

MA 7/10/17

## (Continuation Sheet)

[illegible]

**From:** Manny Garcia [mannydvm@ucsb.edu](mailto:mannydvm@ucsb.edu)  
**Subject:** Fwd: [REDACTED] mortality 7/8/19  
**Date:** July 16, 2019 at 12:45 PM  
**To:** [REDACTED]

Hi [REDACTED]

Please print a copy of this email thread to be attached to a clinical call that I will drop off.

Thanks  
Manny

Begin forwarded message:

**From:** Manny Garcia <[mannydvm@ucsb.edu](mailto:mannydvm@ucsb.edu)>  
**Subject:** Re: [REDACTED] mortality 7/8/19  
**Date:** July 16, 2019 at 12:34:04 PM PDT  
**To:** [REDACTED]  
**Cc:** [REDACTED], [REDACTED], [REDACTED]

Hi [REDACTED], and [REDACTED]:

I didn't observe any abnormalities in the appearance or behavior of the 20 sharks in this enclosure. I'm unable to determine the cause of death for the found dead shark, but my main concern is that there may have been an opportunistic infection (bacterial sepsis) in this animal resulting from environmental stress (over-crowding). I would recommend that you try and find new homes for some of the juveniles sharks, and that in the meantime you decrease the stocking density by moving some of the sharks to a different enclosure, if possible.

Thanks  
Manny

On Jul 16, 2019, at 9:43 AM, [REDACTED] wrote:

Hi Manny,

At the time there were 19 other sharks in the tank. I have not noticed any abnormal activity with them before or after the incident.

They are all being fed chopped fish (pieces in between 1/4 and 1/8 of an inch). I check the food before feeding them to make sure there aren't any large or stinky pieces. I also target feed each of them to make sure they are all eating.

There aren't any problems with the seawater system or water quality that I'm aware of and the others seem to be doing well.

I will be at the [REDACTED] today from 11-12:30 if you happen to stop by today!

Thanks.  
[REDACTED]

On Mon, Jul 15, 2019 at 8:25 AM Manny Garcia <[mannydvm@ucsb.edu](mailto:mannydvm@ucsb.edu)> wrote:

Hi [REDACTED] and [REDACTED]

I just got back. I won't be able to determine anything from the carcass at this point, so you can dispose of it. Please provide me with answers to the following questions. I'll be over some time this week to look at the other sharks, probably tomorrow afternoon.

How many other fish in the tank with the shark and are any of them showing any abnormal appearance or behavior?

What was this shark being fed? How was it eating?

Any problems with the seawater system?

Any water quality problems?

Thanks  
Manny

> On Jul 8, 2019, at 1:10 PM, [REDACTED] wrote:

>

> Hi Manny,

>

> We had a female juvenile swell shark (*Cephaloscyllium ventriosum*) pass today in our juvenile shark tank at the [REDACTED]

>

> The individual has been bagged, labeled and placed in our fridge for you. Let us know when would be a good time to transfer

it to you for necropsy. I've cc'd [REDACTED] and [REDACTED] (acting lead aquarist) as I will be out of town starting tomorrow and won't be around for the rest of the summer. In my absence, we have appointed [REDACTED] (cc'd) who will be standing in as Shark aquarist in my absence.

>

> Thank you,

> [REDACTED]

Case No.: [REDACTED]

Obtained: NA, rec'd 07/26/19  
Reported: 07/30/19

Dr. Manny Garcia  
University of California Santa Barbara  
Animal Resource Center  
Santa Barbara, CA 93106-5060

Patient ID: Swell Shark (#1)  
Account #: [REDACTED]  
Telephone: (805) 893-2333  
FAX #: 893-2005  
E-mail: manuel.garcia@ucsb.edu

**HISTORY:** This shark was found dead in its cage.

**CLINICAL DIAGNOSIS:** Open.

**GROSS:** Received in formalin are multiple tissues to 6 cm. in greatest dimension that are processed in two blocks.

**MICROSCOPIC:** **Rectum:** Transmural congestion, hemorrhage, and edema with ulceration are noted in the mucosa of the rectum. **Heart:** Endothelial cells are mildly hypertrophied. **Epigonal organ:** The epigonal organ is edematous, and random low numbers of necrotic cells are noted. **Gill:** The gill arch is edematous, and some mild necrosis is noted in the secondary lamellae. **Liver:** A single small focus of portal lymphocytic inflammation is noted. **Stomach:** The submucosa is edematous. The following tissues are histologically within normal limits: gallbladder, spiral colon, pancreas, rectal gland, and spleen.

**HISTOPATHOLOGIC DIAGNOSIS:**

1. Acute transmural congestion, hemorrhage, edema, and ulceration, rectum.
2. Endothelial cell hypertrophy, heart.
3. Edema with mild necrosis, epigonal organ.
4. Edema with mild necrosis, gill and gill arch.
5. Mild focal portal lymphocytic hepatitis.
6. Mild edema, submucosa of stomach.

**COMMENT:** The primary problem in this case appears to be the transmural hemorrhage and other changes associated with the rectum. Lesions of this nature are sometimes associated with prolapse, and I would be interested in the history in this regard. Subsequent to this process, this animal developed findings consistent with endotoxemia or cardiovascular shock. The fish was in excellent nutritional status. No underlying chronic disease processes were noted.

E-mail: [REDACTED]

[REDACTED] rectal ulceration with transmural hemorrhage (prolapse-like).

Case No.: [REDACTED]

Obtained: NA, rec'd 07/26/19  
Reported: 07/30/19

Dr. Manny Garcia  
University of California Santa Barbara  
Animal Resource Center  
Santa Barbara, CA 93106-5060

Patient ID: Swell Shark (#2)  
Account #: [REDACTED]  
Telephone: (805) 893-2333  
FAX #: 893-2005  
E-mail: manuel.garcia@ucsb.edu

**HISTORY:** This swell shark was euthanized. No other history is provided.

**CLINICAL DIAGNOSIS:** Open.

**GROSS:** Received in formalin are multiple tissues to 6 cm. in greatest dimension that are processed in two blocks.

**MICROSCOPIC:** **Gill:** The gills have some atrophy of the secondary lamellae and hemorrhage between the lamellar folds. **Rectum:** Transmural congestion, hemorrhage, and edema with ulceration are noted in the mucosa of the rectum. **Stomach:** The submucosa is edematous. The following tissues are histologically within normal limits: liver, gallbladder, pancreas, spiral colon, and spleen.

**HISTOPATHOLOGIC DIAGNOSIS:**


1. Acute transmural congestion, hemorrhage, edema, and ulceration, rectum.
2. Atrophy and hemorrhage, gills.
3. Edema, stomach.

**COMMENT:** Histologic findings in the rectum are as seen in a conspecific submitted at the same time and are suggestive of prolapse or other form of trauma. The gill lesions may be related to euthanasia. I would be interested in any additional history for these swell sharks and any gross photographs that may be available of the rectal lesion.

E-mail: [REDACTED]

[REDACTED] rectal ulceration with transmural hemorrhage (prolapse-like), euthanasia.

Reviewed by:

 7/31/19  
Initials/Date



UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 7/23/19	Animal ID: NA	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: SWEET SHARK	Strain/Sex:
Investigator: [REDACTED]	Lab Contact:	Phone No.:

Observations/Comments:

1 JUV. SWEET SHARK, ♂ EPIC 7/22/19  
1 JUV. SWEET SHARK, ♂ EUTH 7/22/19  
FOR HUMANE & DIAG. REASONS

Clinical Call Submitted By (Name/Date): [Signature] 7/23/19

## Veterinary Clinical Call Record

(Continuation Sheet)

Protocol No.:	Species:	Page No.:
Surgical Procedure:	Surgery Date:	Pre-Surgery BW:

[illegible]

From: Manny Garcia [mannydvm@ucsb.edu](mailto:mannydvm@ucsb.edu)  
Subject: Re: [REDACTED] Mortality 7/22/19  
Date: July 23, 2019 at 4:18 PM  
To: [REDACTED]  
Cc: [REDACTED]

Hi [REDACTED] and [REDACTED]:

I will send out the tissues from the two juvenile swell sharks, but on preliminary examination of the carcasses my suspicion is that these succumb to an opportunistic bacterial infection and sepsis.

Per our conversation, please test the water quality in the larger tank, especially the dissolved oxygen levels. Also, if the pale shark with an increased respiration rate in the large tank is not doing better by tomorrow, then you should euthanize it.

Finally, the 12 sharks in the smaller tank (1/2 size of original tank) are still overcrowded, and you should separate them or move them to a larger tank, if possible (I know you're running out of tank space). Long-term, you should reduce the size of the shark colony (too many fish for the available space).

Thanks  
Manny

On Jul 23, 2019, at 11:10 AM, [REDACTED] wrote:

I am available and will plan on being at the [REDACTED] by 3. See you then!

On Tue, Jul 23, 2019 at 9:20 AM Manny Garcia <[mannydvm@ucsb.edu](mailto:mannydvm@ucsb.edu)> wrote:

Thank you. I will have some time late afternoon (after ~3pm). Will anyone be available, can I stop by and have a look at the sharks?

Manny

On Jul 22, 2019, at 6:51 PM, [REDACTED] wrote:

Hi Manny,

Early this afternoon I examined the shark [REDACTED] mentioned. It was breathing hard and the dorsal side appeared to be sloughing off mucous. In observing the ventral side, there was a very obvious cherry-red "donut" around it's cloaca.

Per your direction, I euthanized the shark with MTS. [REDACTED] bagged and refrigerated it along with the earlier deceased shark. [REDACTED] tried dropping them off at ARC late this afternoon, but said no one was there. We'll drop them off tomorrow am.

We did an examination of all the other juveniles and none showed any similar symptoms or any others signs of stress or disease, with the exception of one individual that showed, according to [REDACTED] some fin rot on one fin.

We move 12/20 sharks to a deeper tank to address possible overcrowding, and I am placing the order for vitamins tomorrow

Best,

[REDACTED]

Sent from my iPhone

On Jul 22, 2019, at 12:44 PM, Manny Garcia <[mannydvm@ucsb.edu](mailto:mannydvm@ucsb.edu)> wrote:

Hi [REDACTED]

Please drop off the carcass in the ARC, [REDACTED]. Please euthanize the other shark as well as I will not be able to look at it for a while and I'm afraid it may die before I examine it.

Have you separated the sharks and started feeding the vitamin supplements?

Thanks  
Manny

On Jul 22, 2019, at 12:38 PM, [REDACTED] wrote:

Hi Manny,

We had a male juvenile swell shark (*Cephaloscyllium ventriosum*) pass today in our juvenile shark tank at the [REDACTED]

The individual has been bagged, labeled and placed in our fridge. Let us know when would be a good time to transfer

The animal has been bagged, tagged and placed in our cage. Let us know when there is a good time to transfer it to you for necropsy.

We have another shark in the tank that is acting strange and doesn't seem healthy. Please let me know if you are available to come down to the [REDACTED]

Thanks,  
[REDACTED]

From: manuel.garcia@ucsb.edu  
Subject: Shark update  
Date: July 31, 2019 at 8:00 AM  
To: [REDACTED]  
Cc: [REDACTED]

Good Morning,  
How are the juvenile swell sharks doing? What about the water quality?

I received good news on the path report - there was no infectious disease in either of the two sharks. The primary health problem identified in both swell sharks was rectal hemorrhaging, edema and ulceration. This was the bright red swelling of the area around the cloaca. Unfortunately, the cause of the rectal lesion was not identified/determined by the pathologist, and I'm not sure either what could have caused it. The pathologist speculated that a rectal prolapse or some other form of trauma. I'll consult with some of my colleagues.

Thanks  
Manny



A0777

## Supplier / Line Item Details

C01  
FILE [REDACTED] USA

Contract no value  
PO Number To Be Assigned  
PO Clauses  
no clause  
Quote number

Add discount for this supplier...

Product Description	Catalog No	Size / Packaging	Unit Price	Quantity	Ext. Price
1 3 BUFFER SDL PH 7.00 CERT 500ML 0-	[REDACTED]	EA	2.59 USD	1 EA	2.59 USD
Add discount...					
Supplier only fields (same as header)					
Supplier subtotal					2.59
Sales Tax					0.20
Shipping					0.00
Handling					0.00
Supplier total					2.79 USD
Shipping, Handling, and Tax charges are calculated and charged by each supplier. The values shown here are for estimation purposes, budget checking, and workflow approvals.					
Subtotal					2.59
Sales Tax					0.20
Shipping					0.00
Handling					0.00
Total					2.79 USD



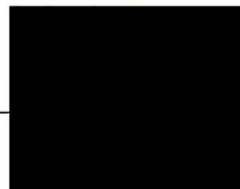
UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 8/6/19	Animal ID:	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: swell shark	Strain/Sex: ♂
Investigator: [REDACTED]	Lab Contact:	Phone No.:

Observations/Comments:

1 FD 8/6/19  
1 FD 8/7/19  
1 FD 8/9/19: same symptoms, did not  
collect carcass for necropsy  
5 FB BETWEEN 8/9 & 8/24/19 G 8/28/19

Clinical Call Submitted By (Name/Date):



8/16/19

# Veterinary Clinical Call Record

(Continuation Sheet)

Protocol No.:	Species:	Page No.:
Surgical Procedure:	Surgery Date:	Pre-Surgery BW:

Date	Time	Observations/Treatment	Initials
8/7/19	9.59	<p>(1) One hatchling found dead on 8/6/19 - Male swell shark (total 3)</p> <p>Necropsy - Moderate ventral erythema mid-body. Ulceration around the vent/loaca.</p> <p>Liver - NAD. One area of dark pigment seen in the liver</p> <p>GIT - Had 3 small stones in the stomach for intestine.</p> <p>Otherwise NAD on exam</p> <p>Samples in formalin - liver, kidney, stomach, spiral colon, heart, skin (including ulcerated cloaca).</p> <p>Dx - open</p>	
8/7/19	9.59	<p>(2) One hatchling found dead on 8/7/19 - male swell shark.</p> <p>Necropsy - no external lesions</p> <p>Liver - NAD. One area of dark pigment seen in the liver similar to the above shark.</p> <p>GIT - NAD. No gravel found</p> <p>Otherwise NAD on exam</p> <p>Samples in formalin - liver, kidney, stomach, spiral colon, heart, skin.</p> <p>Dx - open</p>	

# Veterinary Clinical Call Record

(Continuation Sheet)

Protocol No.:	Species: SWELL SHARK	Page No.: 2
Surgical Procedure: NA	Surgery Date: _____	Pre-Sx Body Weight: _____

Date	Time	Observations/Treatment	Initials
8/28/19	1503	5 MORE SWELL SHARKS, JUV., ALL OF V. SIMILAR AGE, HAVE BEEN FD SINCE THE LAST REPORTED CASE (8/9/19). ALL ANIMALS HAD SIMILAR CLINICAL PROBLEM - ULCERATION/SWELLING OF CLOACA & LONG WHITE STRINGY MATERIAL PROTRUDING FROM CLOACA. SOME ALSO HAD V. ABDOMINAL ERYTHEMA. NECROPSY PERFORMED ON 2 OF THE SHARKS: ① ♂ JUV. SWELL SHARK. FD ON 8/24/19. MARKED ERYTHEMA V. ABDOMEN. LONG WHITE VISCIOUS MATERIAL PROTRUDING FROM CLOACA. LIVER, HEART, SPLEEN, GONAD, KIDNEY - NO ABN, GROSS OBSERVED. STOMACH ALSO WNL. SM. INTESTINE, 1 SMALL PEBBLE IN LUMEN BUT NO EVID. OF OBSTRUCTION LG INTESTINE - LG AMOUNT OF WHITE VISCIOUS SUBSTANCE (?pus) IN THE LUMEN. NO FB. SPIRAL VALVE - HEMOR. & SOME WHITE VISCIOUS SUBST. RECTUM - HEM. / ULCERATION. SWAB OF WHITE VISCIOUS MATERIAL COLLECTED FOR AEROBIC BACT. C/S. 2) ♀ JUV. SWELL SHARK. FD ON 8/17/19. MARKED DECOMP. SIMILAR FINDINGS TO #1, EXCEPT NO FB IN SM INT.; NO WHITE VISCIOUS MATERIAL IN LG INT. OR SPIRAL VALVE.	



From: [REDACTED]  
Subject: Re: [REDACTED] Mortality 8/6/19  
Date: August 7, 2019 at 1:30 PM  
To: [REDACTED]  
Cc: [REDACTED] Manny Garcia mannydvm@ucsb.edu,

Hi [REDACTED]

Thank you for update.

We removed all of the gravel yesterday to A) clean it, and B) dispose of, if the vet's findings showed that they were swallowing gravel.

The reason we cleaned it is, after running water quality test yesterday am, the results showed a high level of ammonia in the tank. So, we wanted to make sure it wasn't due to dirty gravel.

Given the vet's findings, we are not going to put the gravel back in. The volume in tank 3 is great than the volume in the space in tank 2, and as previously indicated we split the population to minimize the densities, which now are below the max. The sharks in tank 2 have not had any problems. At this point, I am hoping that, now that the gravel is removed, we will not have any more morts.

We have been contacting other aquariums to see if there is any interest in taking some of ours. So far, though, we've not had any requests.

We'll continue to monitor them and keep you posted.

Thanks,

On Wed, Aug 7, 2019 at 11:51 AM [REDACTED] wrote:

Hi [REDACTED]

The dead shark from today was from the same tank as all of the others that have died (Tank 3).

Thank you,

On Wed, Aug 7, 2019, 10:07 AM [REDACTED] wrote:

Hi [REDACTED]

What tank did the second dead shark come from? Also, [REDACTED] did find 3 pieces of gravel in the shark found dead yesterday, but none in the shark found dead today. [REDACTED] collected tissues in formalin and wrote up the necropsy report. We'll wait for Manny to get back from vacation to determine if we need to send them out.

[REDACTED]  
[REDACTED]  
[REDACTED]  
UC Santa Barbara  
Animal Resource Center  
Office: (805) 893- [REDACTED]  
Mobile: [REDACTED]  
Email: [REDACTED]

On Aug 6, 2019, at 2:22 PM, [REDACTED] wrote:

Hi [REDACTED] (and Manny).

██████████ will be in this afternoon and can drop the carcass by before 4:30.

██████████ one of my interns, asked an interesting question yesterday with regards to the recent shark morts. ██████████ was wondering if, perhaps the sharks might be ingesting the gravel, as it is similar in size and color to their food. And, that, perhaps, the gravel was getting lodged in the spiral valves of digestive tract. Given their size, I am wondering if it is even possible to dissect an individual to this degree, but wanted to put it out there.

Thanks,

██████████

On Tue, Aug 6, 2019 at 9:57 AM ██████████ wrote:

Hi ██████████

Thank you for the notification. Please drop the carcass off at the ARC ██████████. I will try to have our back-up vet perform a necropsy on this animal but her schedule may not allow her to look at it right away.

Best,

██████████

██████████

██████████

UC Santa Barbara  
Animal Resource Center  
Office: (805) 893-██████████  
Mobile: ██████████  
Email: ██████████

On Aug 6, 2019, at 8:31 AM, ██████████ wrote:

Hi Manny and ██████████

We had a male juvenile swell shark (*Cephaloscyllium ventriosum*) pass today in our juvenile shark tank (Tank 3) at the ██████████. He had similar symptoms to the others that recently passed, including: Red/irritated cloaca, light/pale coloring, and occasional erratic swimming. We now have nine individuals in Tank 2 and seven in Tank 3.

This shark has been bagged, labeled, and placed in our fridge. Let me know if you'd like me to transfer it to you for necropsy.

Thanks.

██████████

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██████████

██████████ UCSB  
Santa Barbara, CA  
93106-6150  
805-893-██████████  
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UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 9/10/19	Animal ID: "CAGE 5"	Protocol No.: [REDACTED]
Location: [REDACTED]	Species: MOUSE	Strain/Sex: [REDACTED] Tg
Investigator: [REDACTED]	Lab Contact: [REDACTED]	Phone No.: [REDACTED]

Observations/Comments:

FDIC ON 9/8/19

Clinical Call Submitted By (Name/Date):

 9/10/19

## Veterinary Clinical Call Record

**(Continuation Sheet)**

<b>Protocol No.:</b>	<b>Species:</b>	<b>Page No.:</b>
<b>Surgical Procedure:</b>	<b>Surgery Date:</b>	<b>Pre-Sx Body Weight:</b>

[illegible]

UCSB Animal Resource Center  
Veterinary Clinical Call Record

Date: 9/10/19	Animal ID: [REDACTED]	Protocol No.:
Location: [REDACTED]	Species: [REDACTED]	Strain/Sex: ♂
Investigator: [REDACTED]	Lab Contact: [REDACTED]	Phone No.:

Observations/Comments:

FDIC

Clinical Call Submitted By (Name/Date):

MG 9/10/19

# Veterinary Clinical Call Record

**(Continuation Sheet)**

<b>Protocol No.:</b>	<b>Species:</b>	<b>Page No.:</b>
<b>Surgical Procedure:</b>	<b>Surgery Date:</b>	<b>Pre-Sx Body Weight:</b>

[illegible]