

Coral disease lab analyses



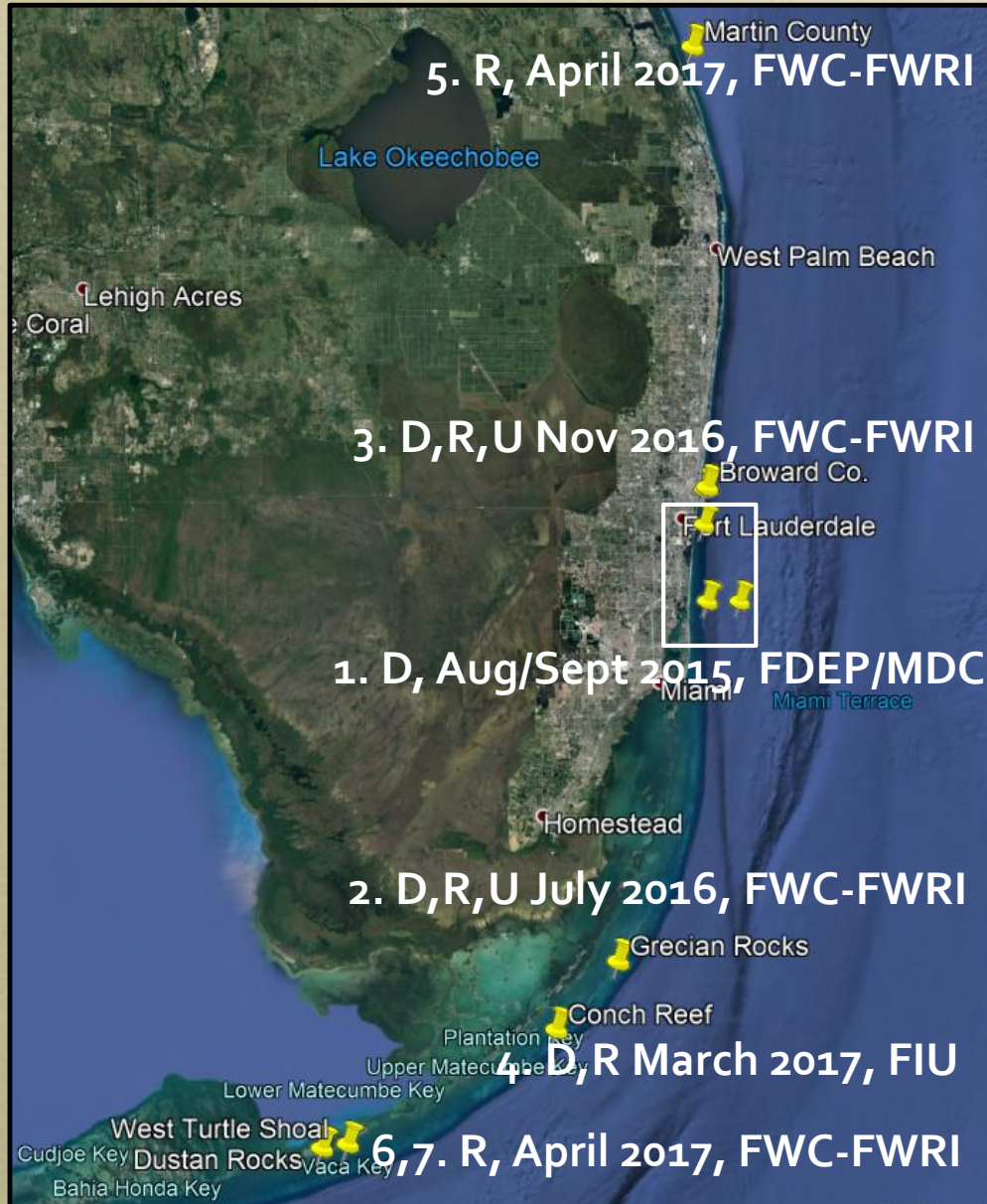
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Clark Gray, Noretta Perry, Yvonne Waters

Sample collection and field photos: Vanessa Brinkhuis,
Lindsay Huebner, Ananda Ellis

Fish and Wildlife Research Institute
Florida Fish and Wildlife Conservation Commission
St. Petersburg, Florida



Sample locations



R = reference,
“apparently healthy”
D = diseased
U = unaffected



Sample summary for histology (2015-2017)

Species	D = 41				U = 27		R = 59						Total
	1	2	3	4	2	3	2	3	4	5	6	7	
<i>S. siderea</i>		3	3	8	3	3	1	3	4	5	3	2	38
<i>M. cavernosa</i>	2	3	10		3	10	1	5		5	3	2	44
<i>D. labyrinthiformis</i>		2			2		1				5		10
<i>C. natans</i>		3			3		1				3	2	12
<i>O. faveolata</i>			3			3		3			4	1	14
<i>D. clivosa</i>										2			2
<i>P. astreoides</i>	1									2			3
<i>E. fastigiata</i>	1												1
<i>M. meandrites</i>	2												2
<i>P. strigosa</i>	1												1
Total	7	11	16	8	11	16	4	11	4	14	18	7	127

1. Broward Co. (2015);
2. Grecian Rocks (FKNMS UK, July 2016);
3. Broward Co. (SECREMP BC₄, Nov. 2016);
4. Conch Reef (March 2017);
5. Martin Co. (SECREMP MC₃, April 2017) ,
6. Dustan Rocks, and
7. West Turtle Shoal (CREMP Patch Reef , MK, April 2017)

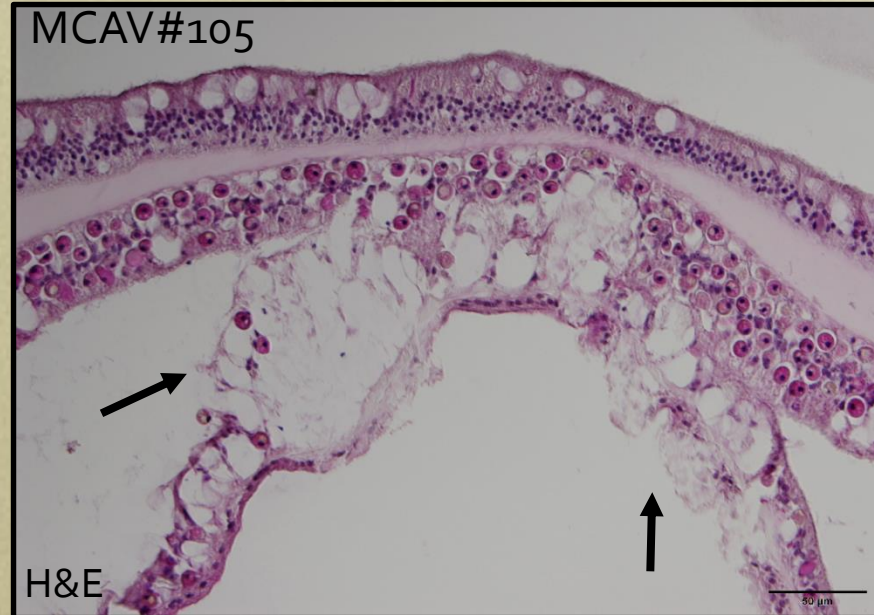
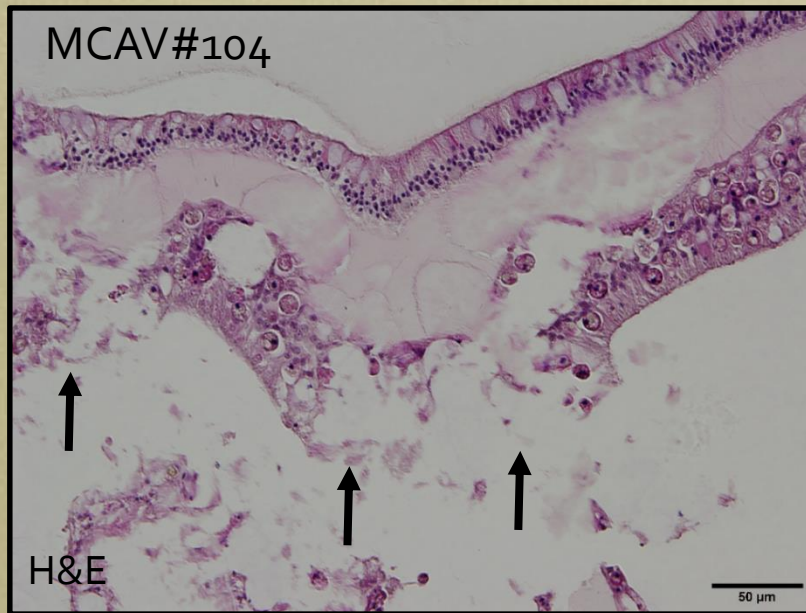
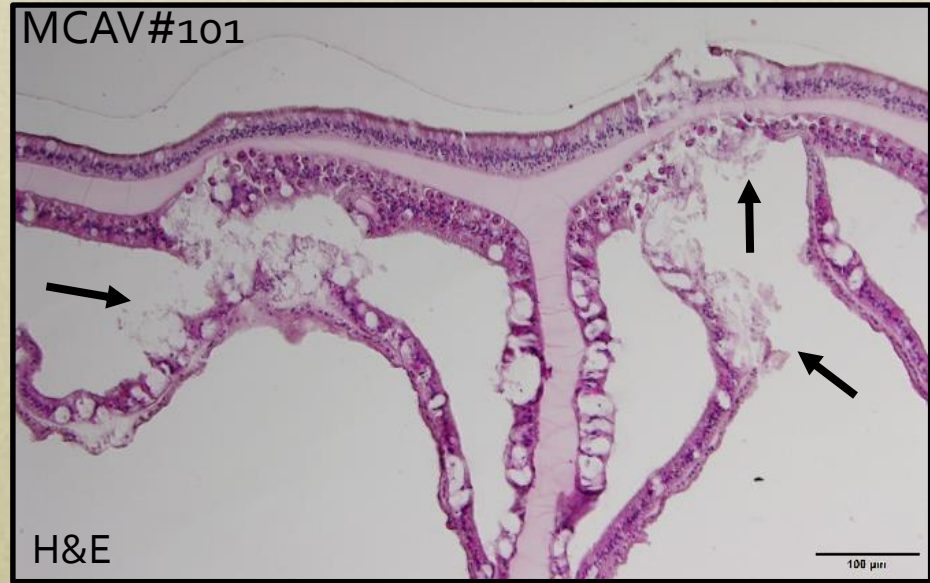
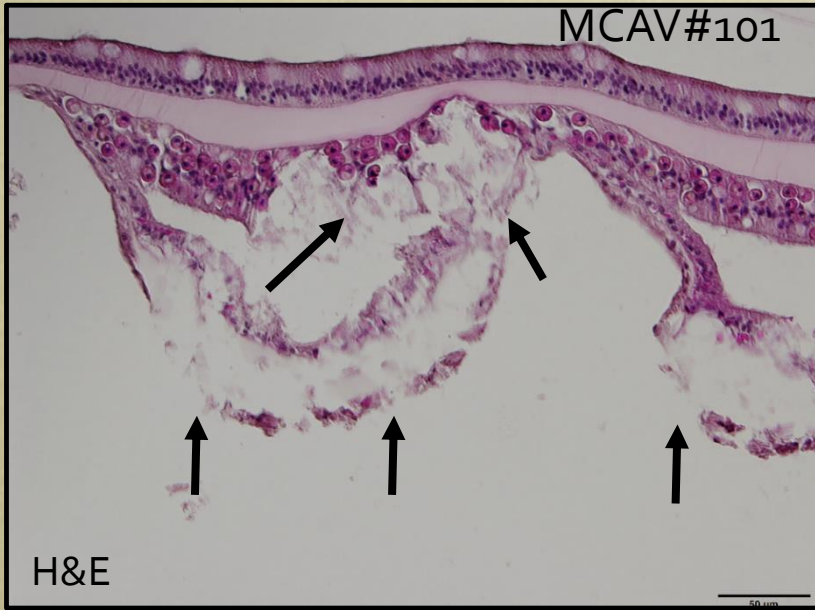


Montastraea cavernosa (1)



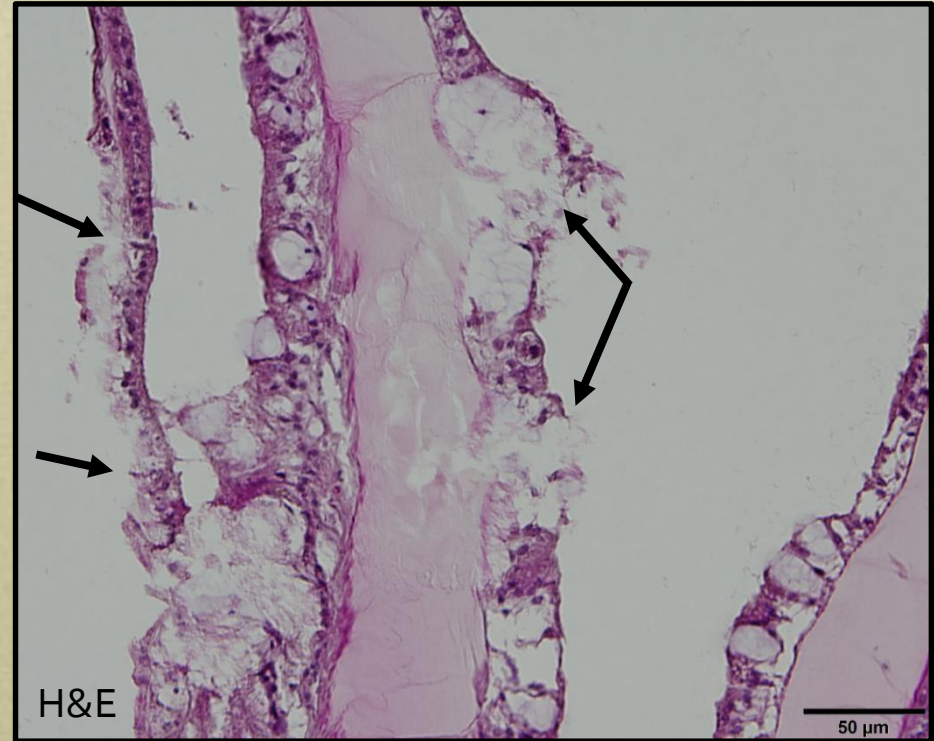
November 2016, Broward Co. MCAV#101, tissue loss

Montastraea cavernosa (2)

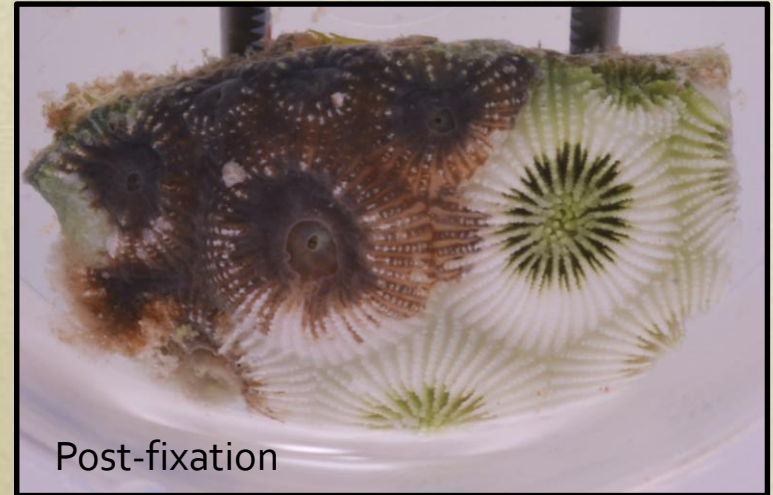


epidermal, gastrodermal and basal body wall lesions

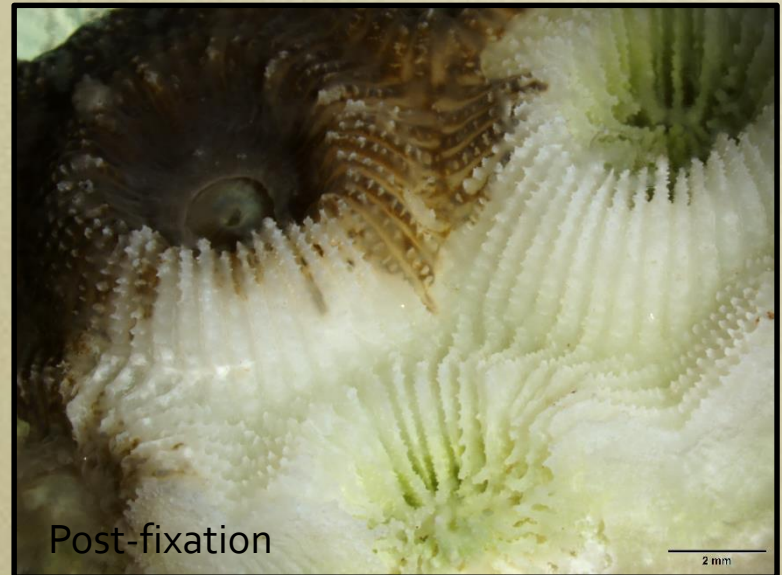
Montastraea cavernosa (3)



Montastraea cavernosa (4)



Post-fixation



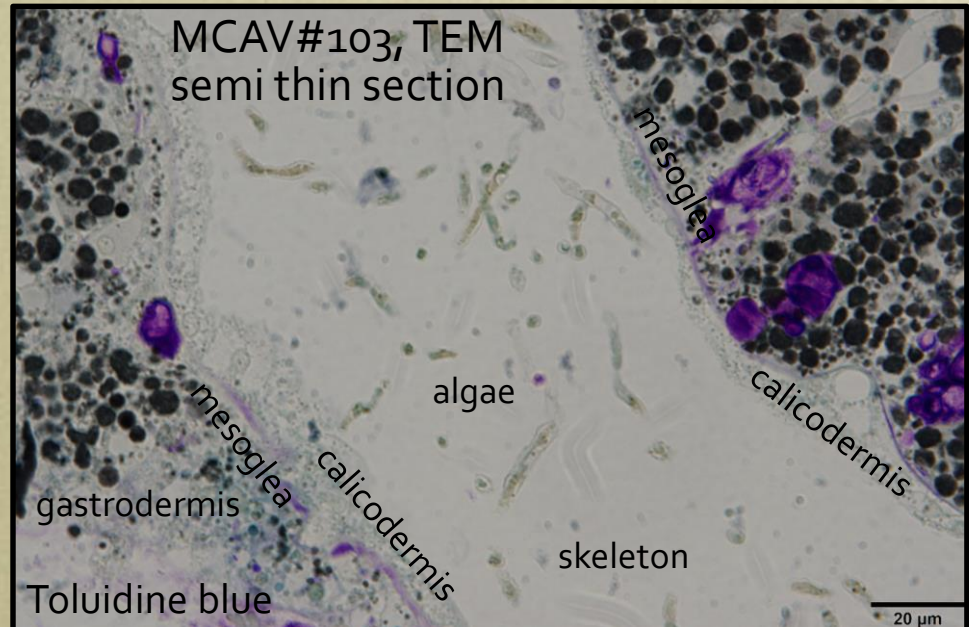
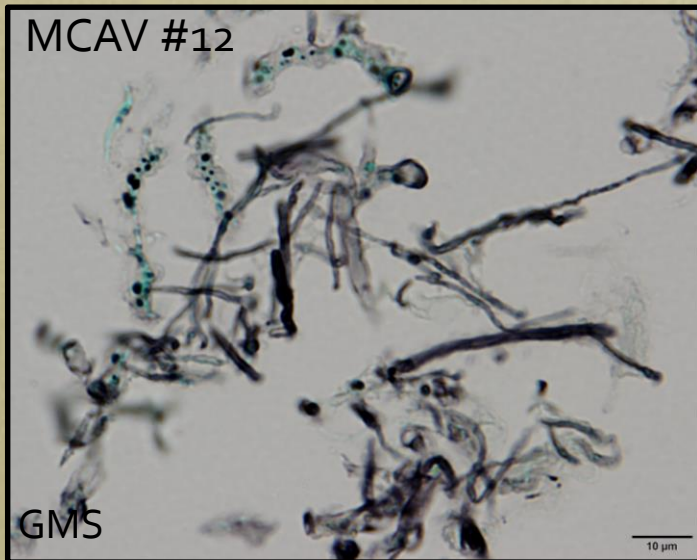
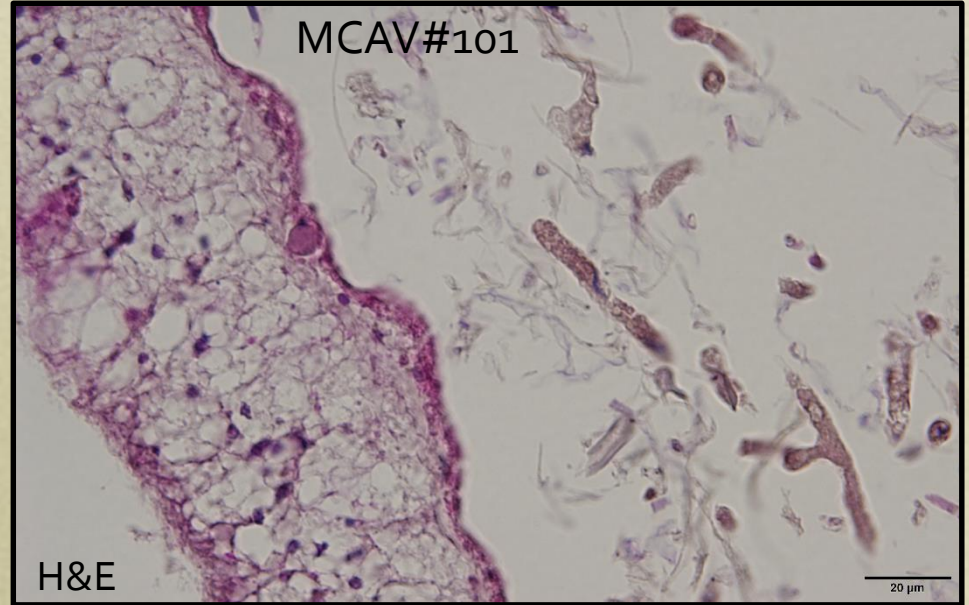
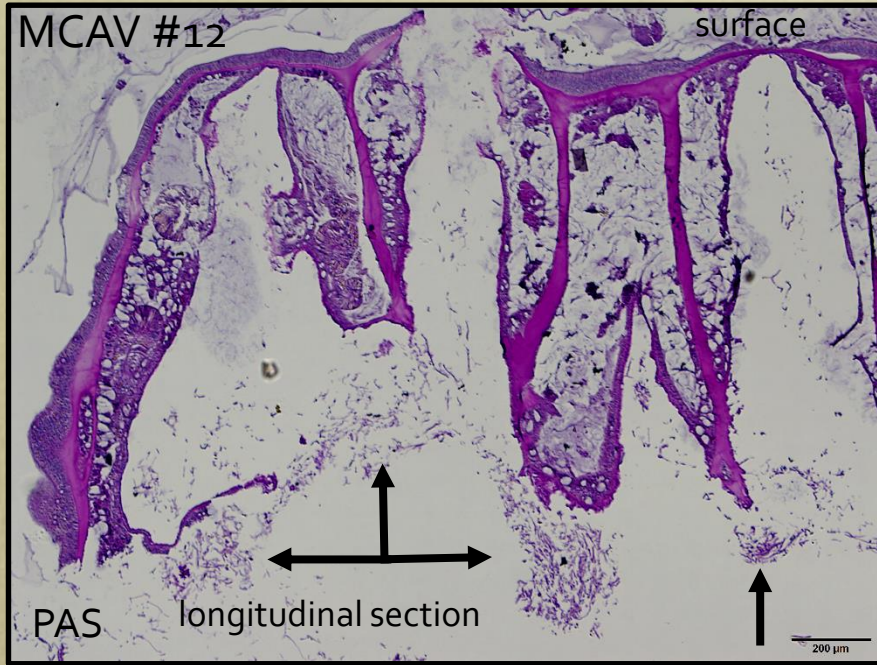
Post-fixation

2 mm



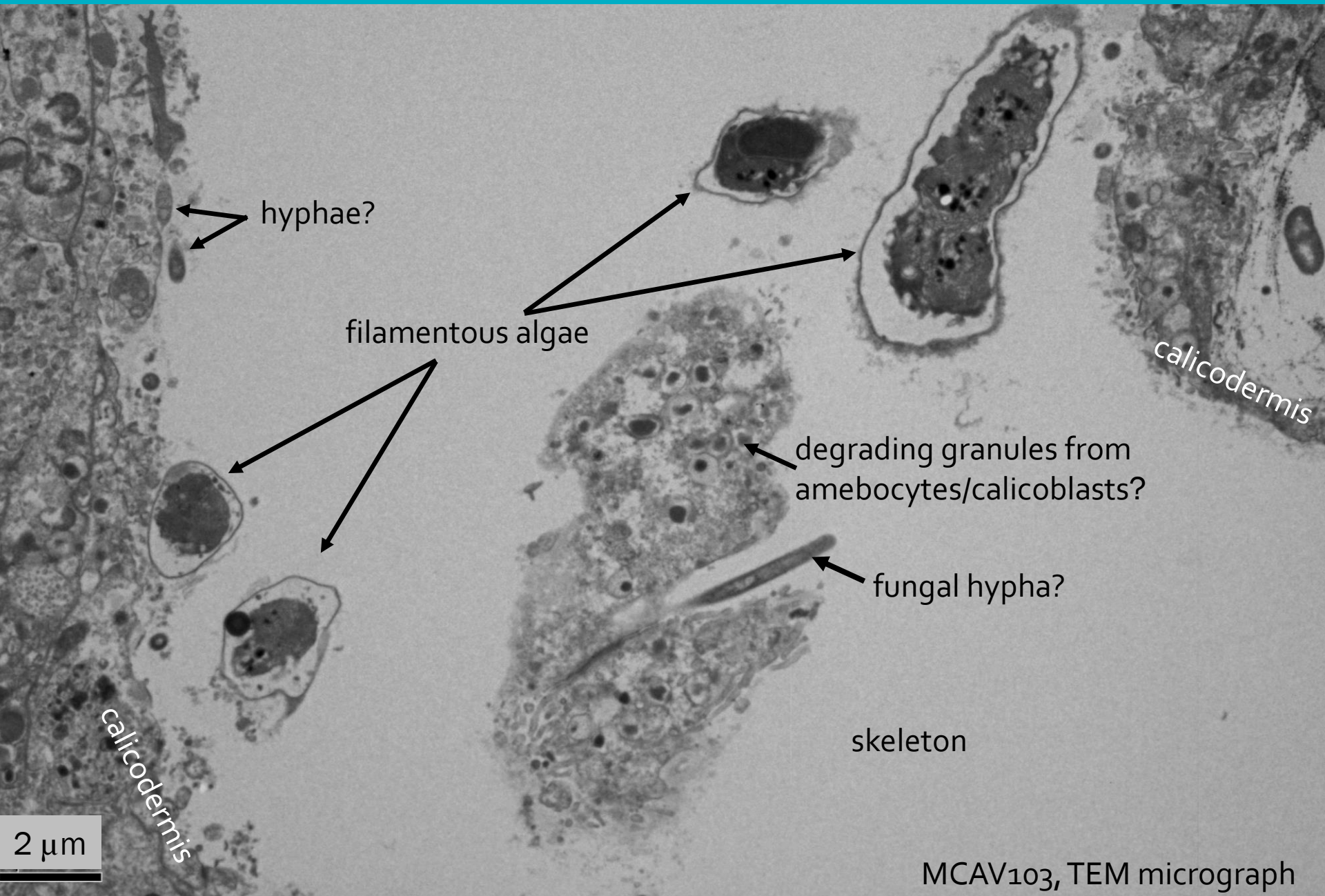
MCAV#103, bleaching, tissue loss, endolithic algae

Montastraea cavernosa (5)



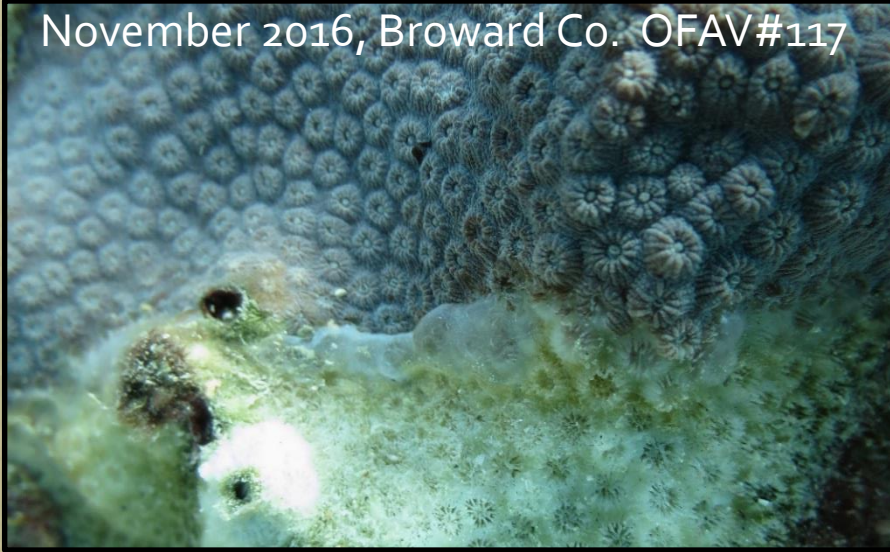
endolithic algae and fungi

Montastraea cavernosa (6)



Multiple species (1)

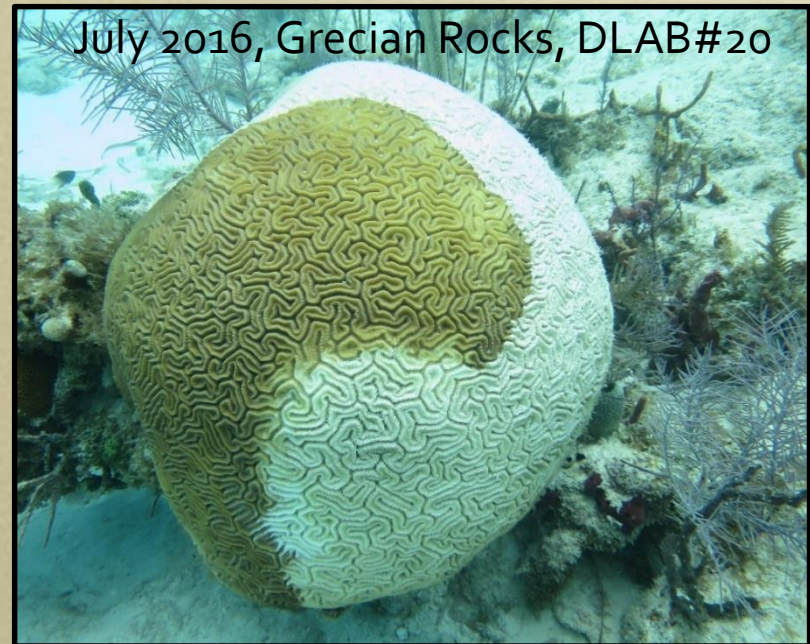
November 2016, Broward Co. OFAV#117



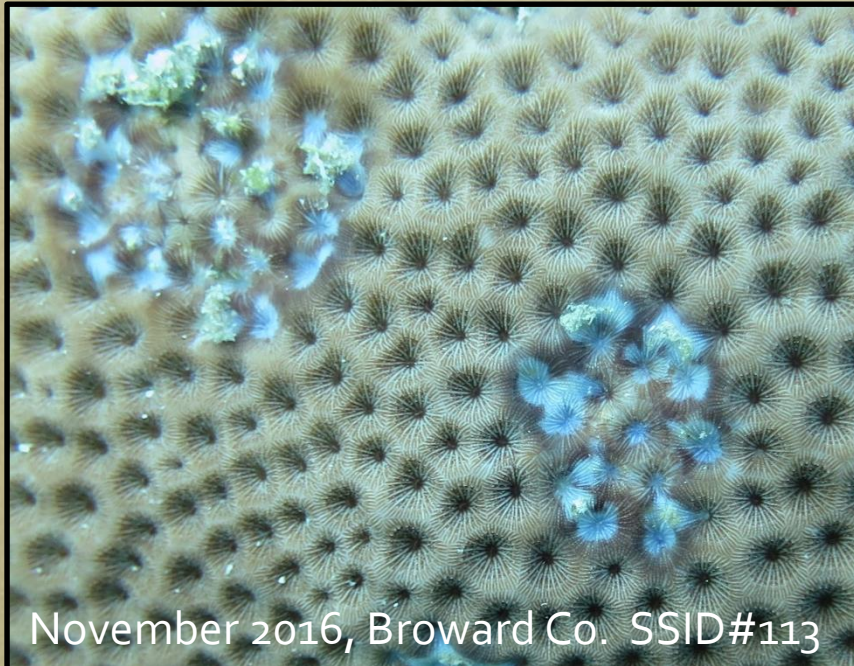
July 2016, Grecian Rocks, CNAT#15



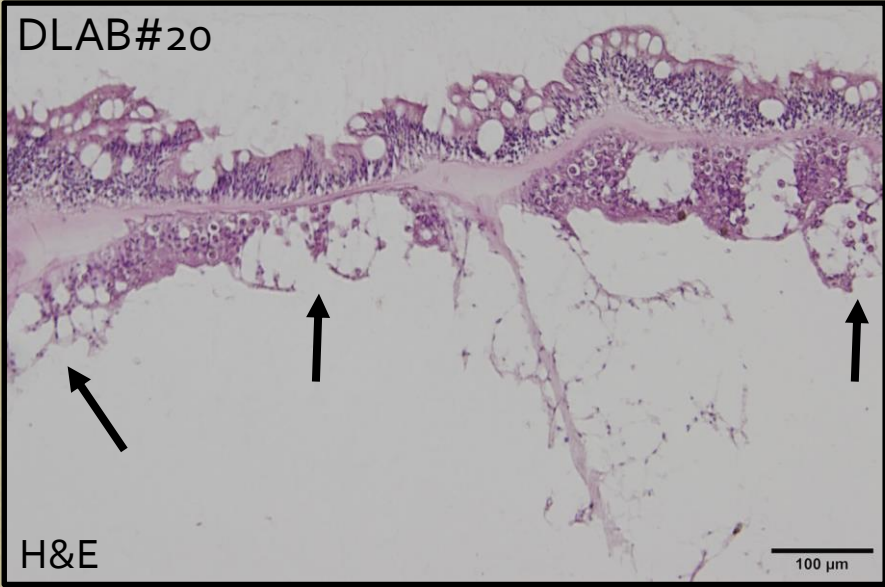
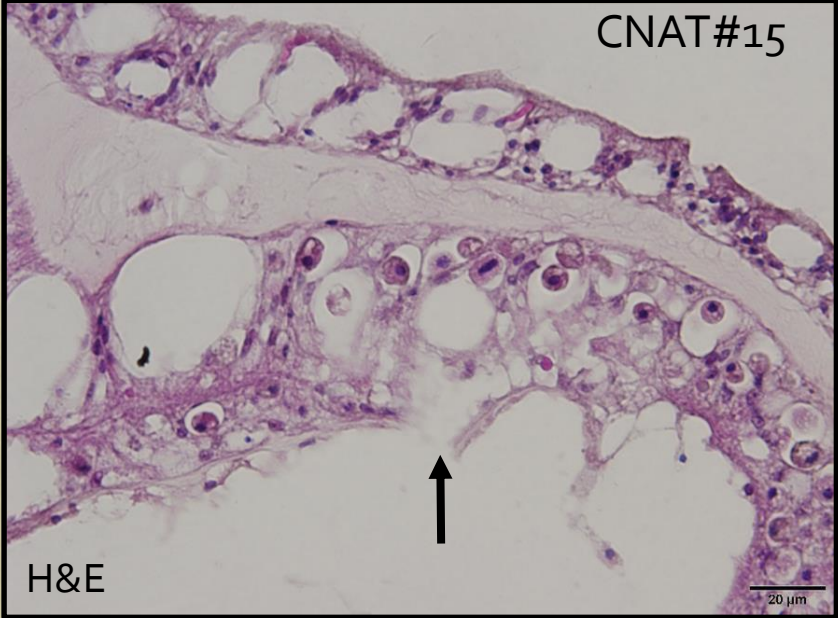
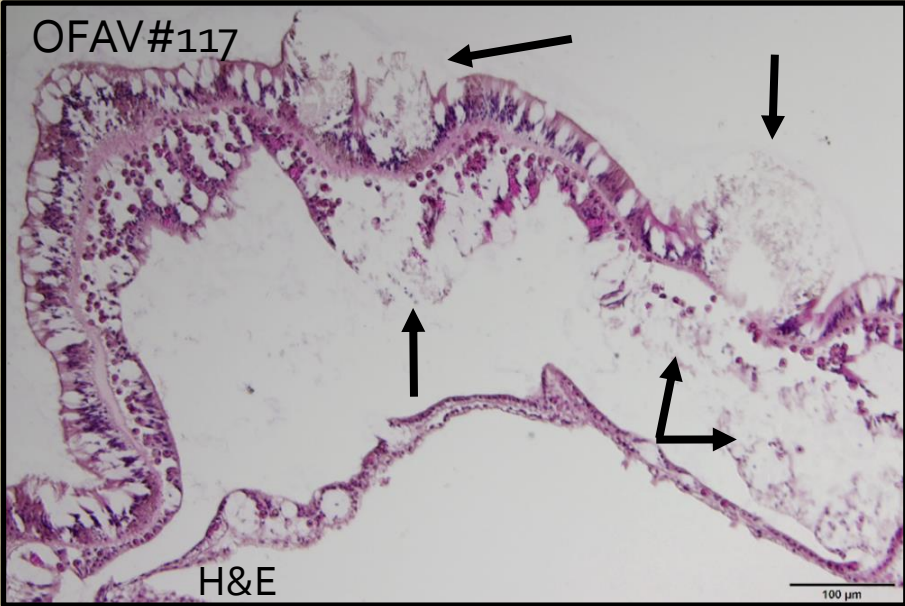
July 2016, Grecian Rocks, DLAB#20



November 2016, Broward Co. SSID#113

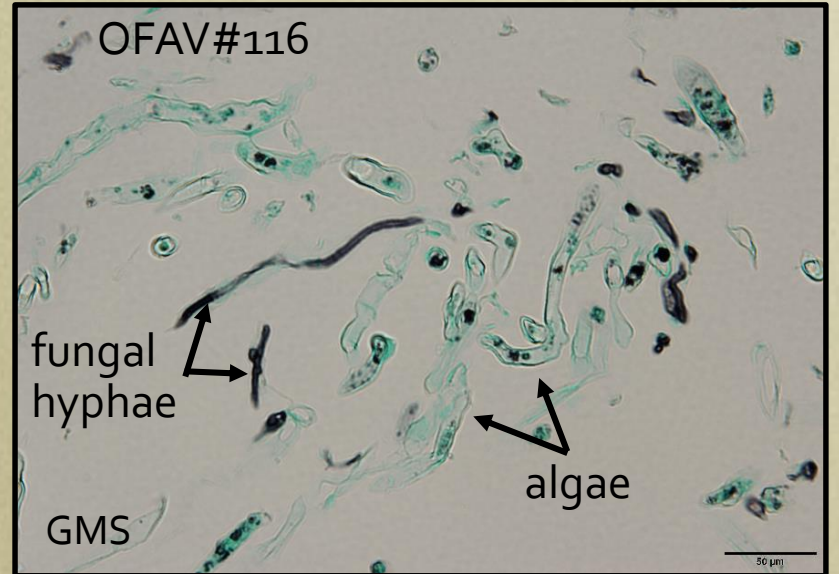
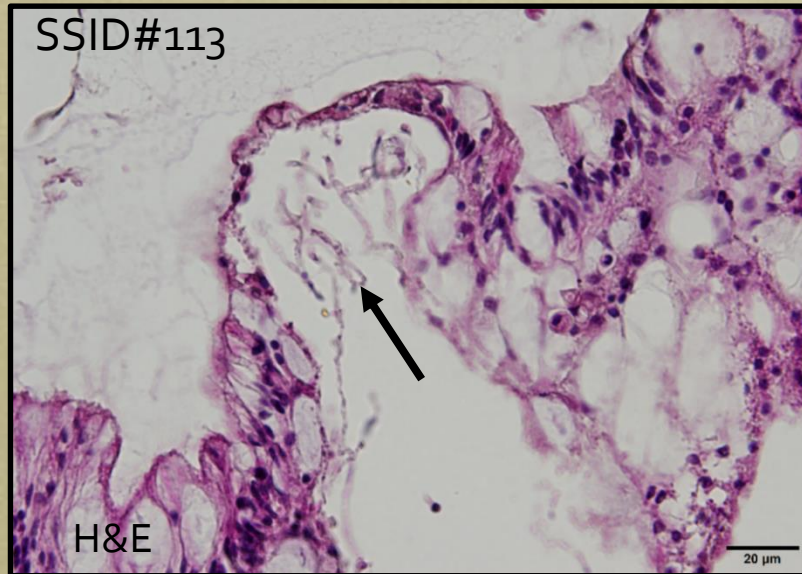
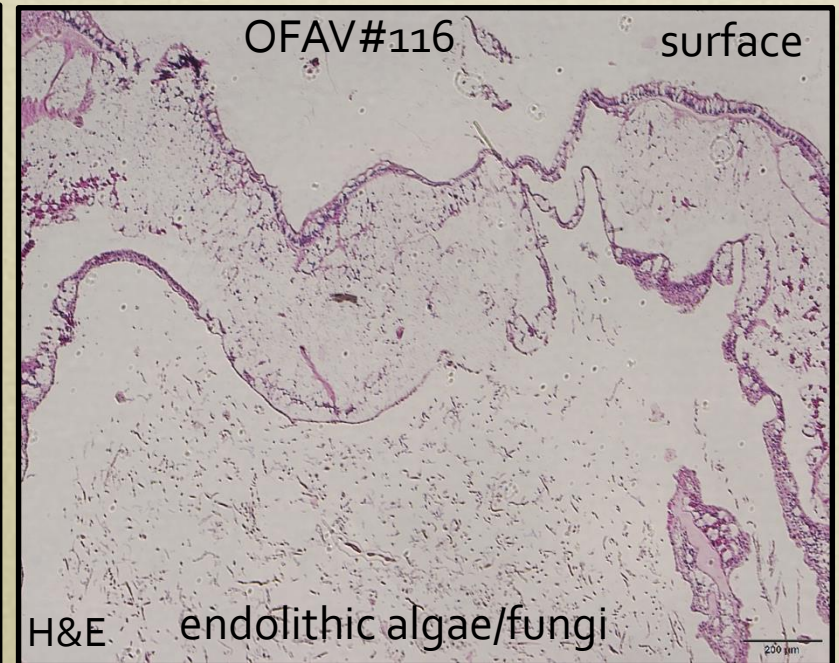
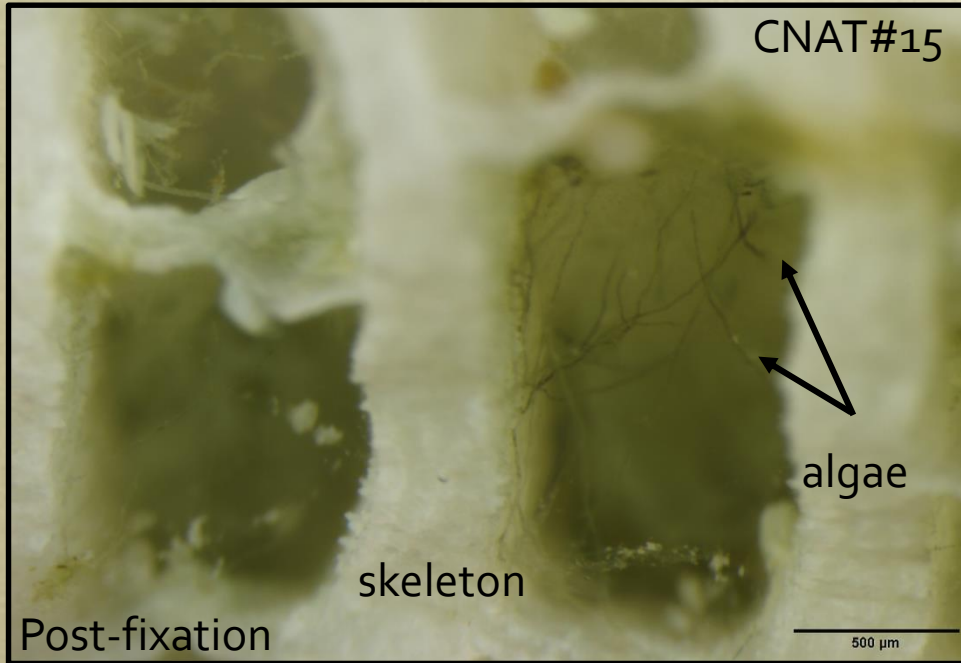


Multiple species (2)



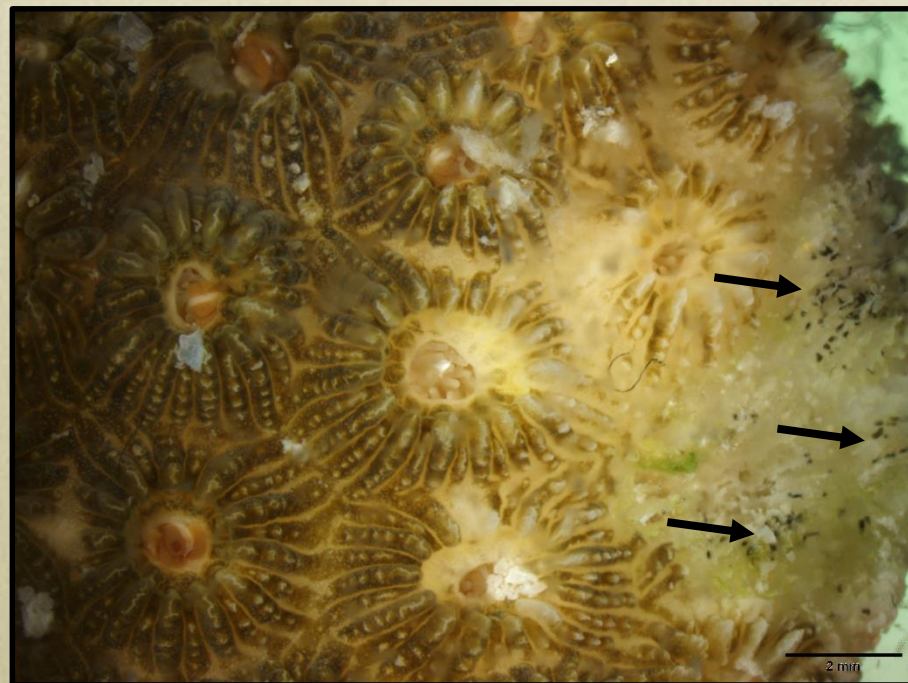
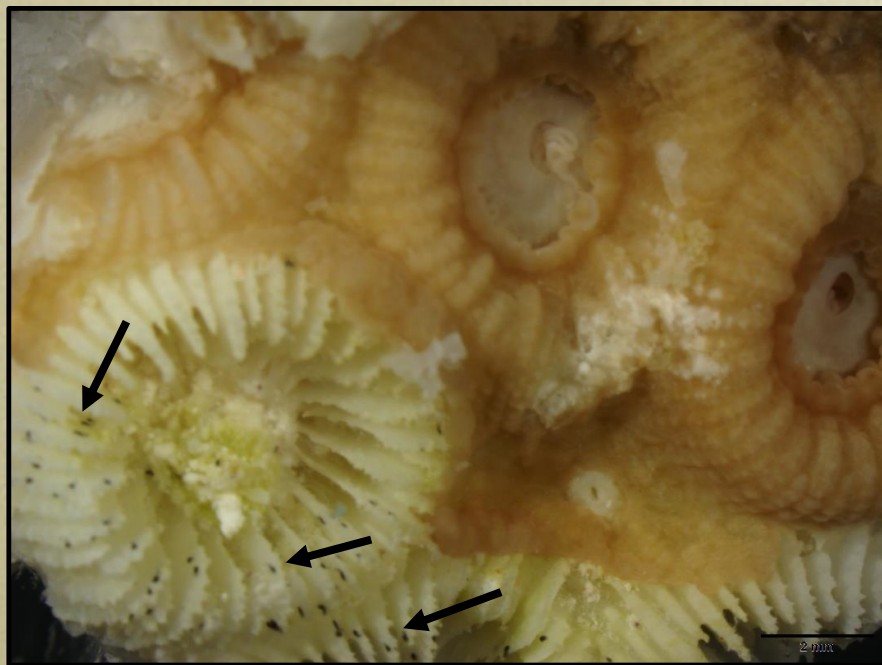
surface and basal body wall lesions

Multiple species (3)

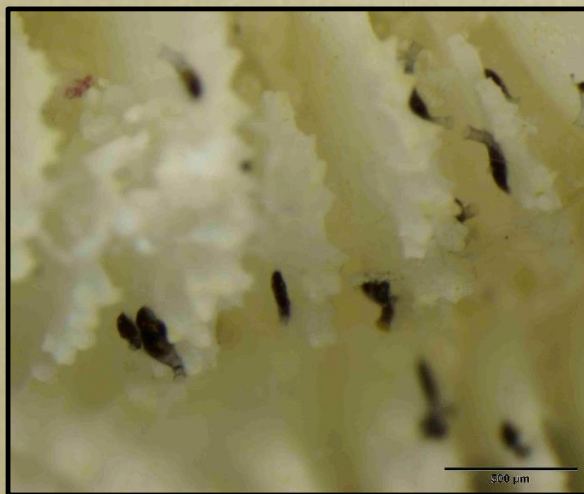


endolithic fungi and algae

Montastraea cavernosa (8), *Orbicella faveolata* (4)



MCAV #12,
7/21/16



OFAV #115,
11/19/16

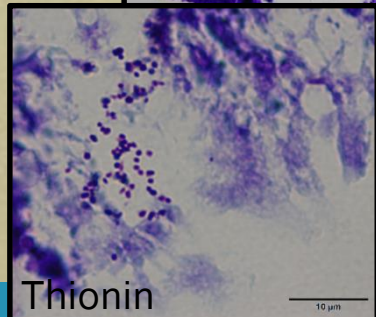
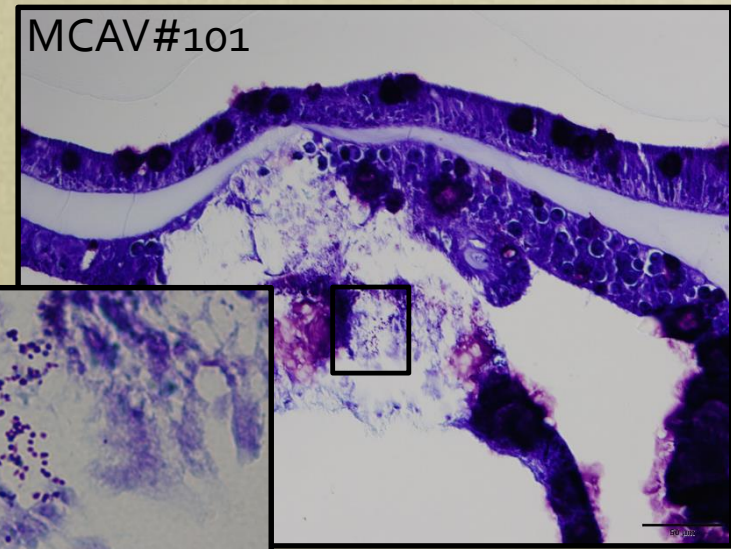
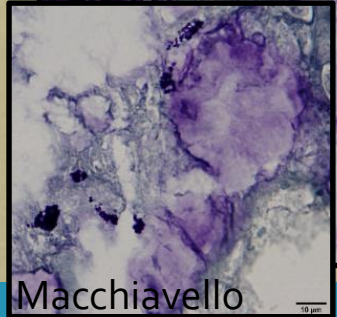
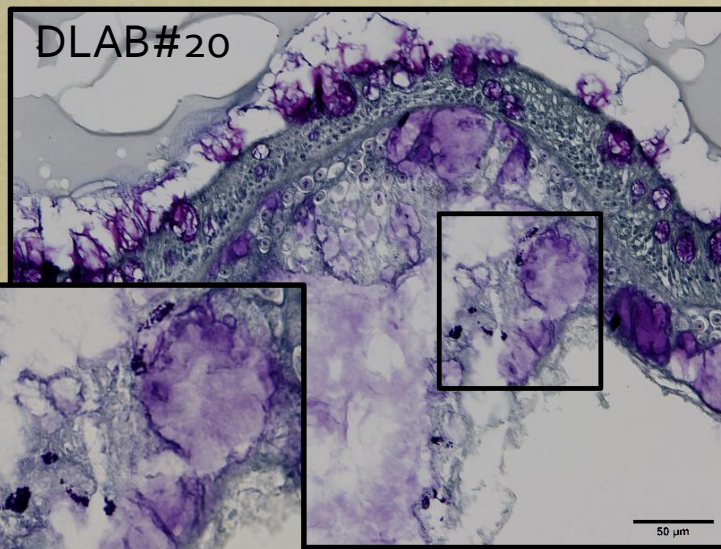


Halofolliculina ciliates not usually at active tissue loss margin



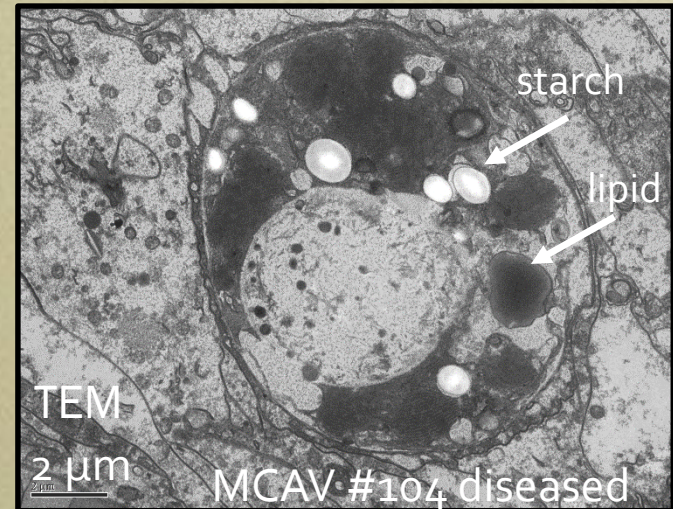
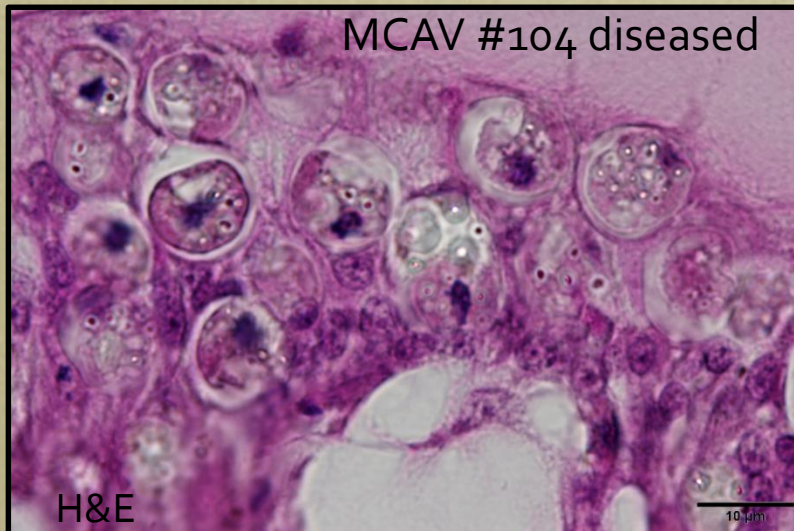
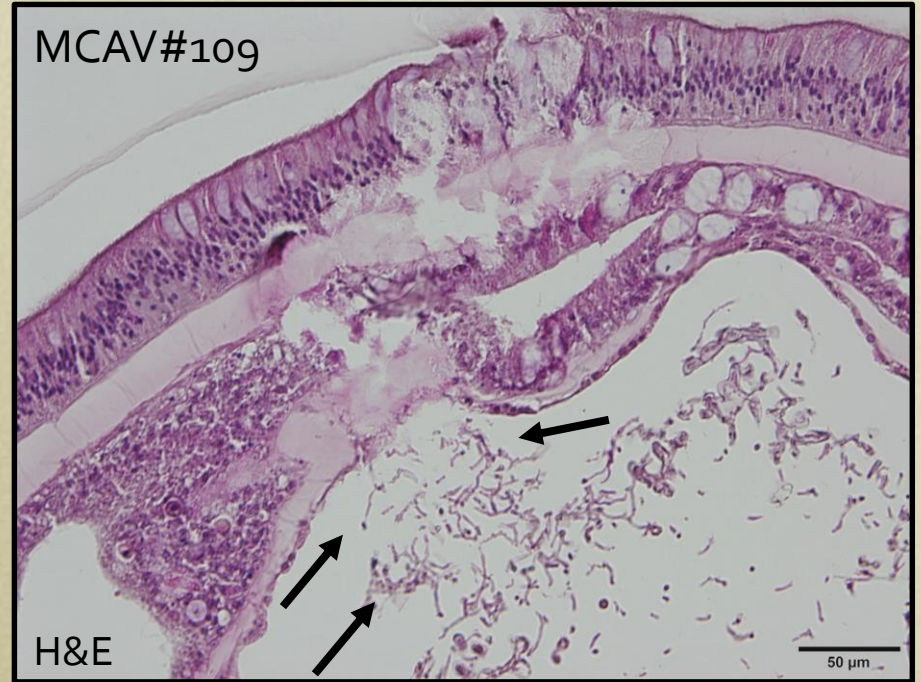
Histology summary (1)

- basal body wall (BBW), gastrodermal lesions in MCAV, often present w/o surface epidermal lesions
- surface lesions more adv. stage of disease?
- BBW lesions in CNAT, OFAV, DLAB, SSID (small sample n)
- ~liquefactive necrosis (tissue digestion? e.g. lytic bacteria, toxins)
- no obvious pathogens (multiple stains, need confirmatory molecular probes/TEM/transmission experiments)



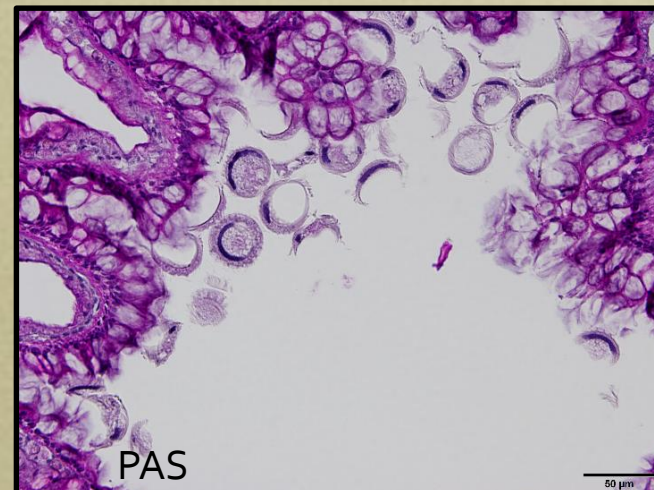
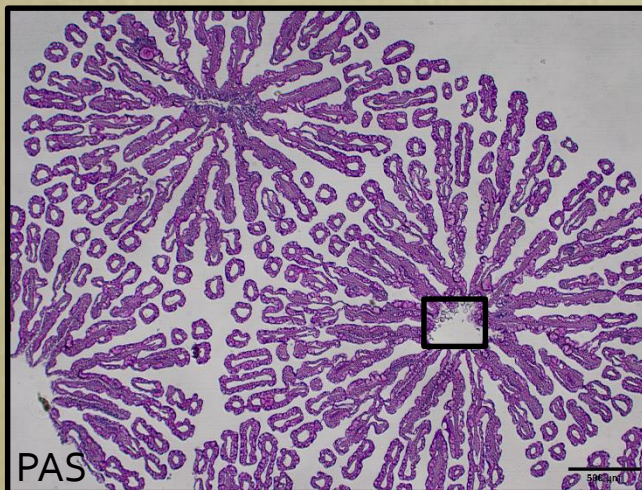
Histology summary (2)

- endolithic algae/fungi common
- phototactic response?
- associated pathology?
- *Halofolliculina* ciliates likely 2^o
- zooxanthellae health compromised?



Recommendations (1)

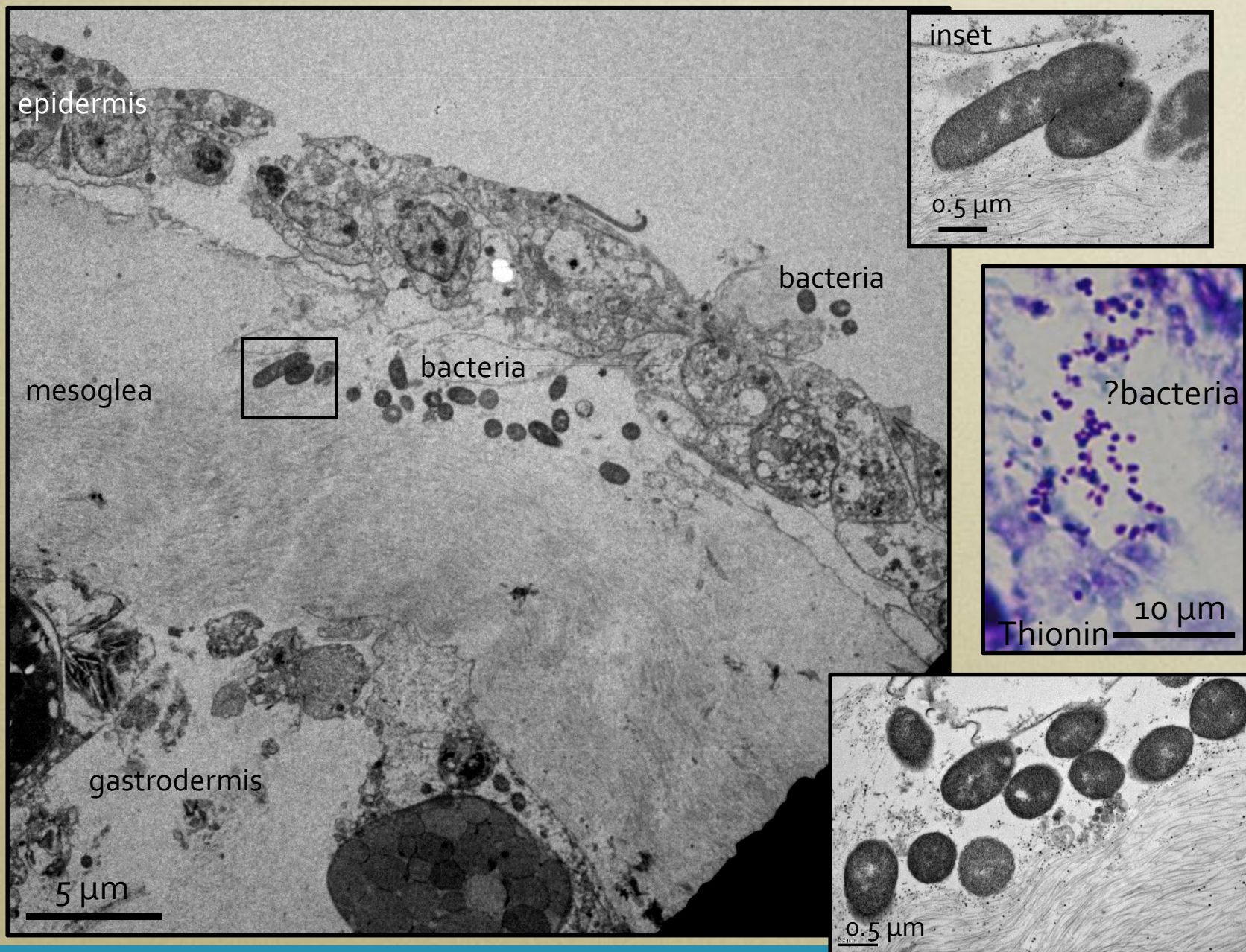
- target small # of active disease sites
- > # of species sampled
- standardize/test distance from lesion for “unaffected” samples
- transect from lesion for diagnostic samples
- > sampling compartments
- > diagnostics (e.g. pathogens [virus?]), toxins, endolithic bioactivity)
- healthy reference samples > southern disease boundary



SSID#214
Reference,
Martin Co.
042517



Montastraea cavernosa (9)



MCAV103, TEM micrograph, 1^o or 2^o infection?