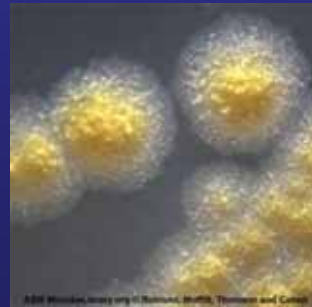


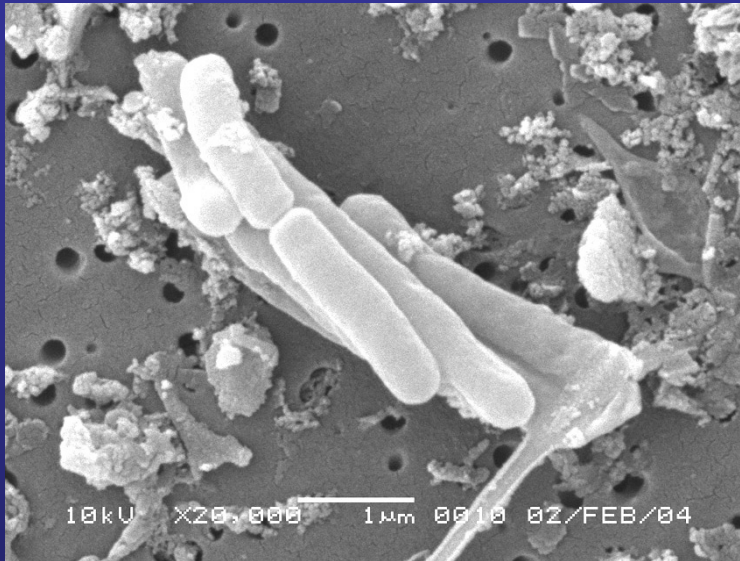
Myocbacterium marinum In Louisiana's Coastal Soil, Water and Fish – A Pilot Study

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Coastal Restoration & Enhancement Through Science & Technology (CREST)
Principal Investigators (PI) and Researchers Meeting
Lyola University, New Orleans
September 16, 2009

Mycobacterium marinum – A Rod-shaped Microbe & Chromogenic



Electron photomicrograph of
Mycobacterium marinum.

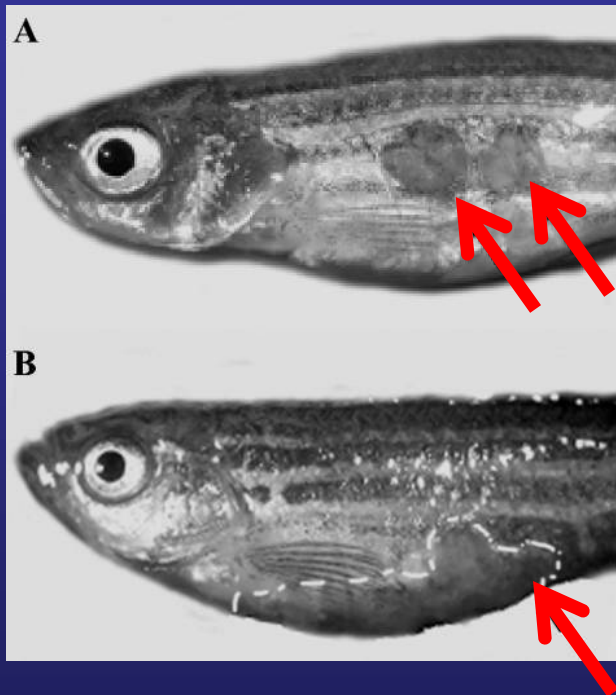
Dr. Mazen Saleh, Laurentian
University, Canada



Chromogenic Growth of
Mycobacterium marinum.

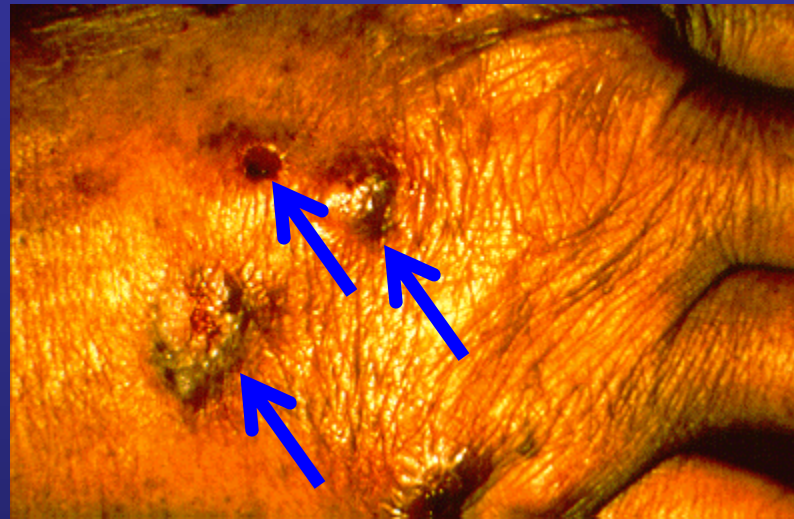
J. Staropoli et al. 2008
Journal of Clinical Microbiology

Mycobacterium marinum – Microbial Pathogen For Fish & Humans



Zebra fish with granuloma.

(A.M. van der Zar, et al. 2004
Infection and Immunity)



Human hand with granulomas.

<http://www.cdc.gov/niosh/topics/skin/occderm-slides/ocderm16.html>; accessed 2009-09-12

Mycobacterium marinum – A Threat for Coastal Fish?

- Emerging pathologies in aquaculture: effects on production and food safety. Ghittino C, et al. Vet Res Commun. 2003 Sep; 27 Suppl 1:471-9.
- Mycobacterium marinum infections in fish and humans in Israel. Ucko M, Colorni A. J Clin Microbiol. 2005 Feb; 43(2):892-5.
- Globally distributed mycobacterial fish pathogens produce a novel plasmid-encoded toxic macrolide, mycolactone F. Ranger BS, et al. Infect Immun. 2006 Nov; 74(11):6037-45.
- Detection of a new Mycobacterium species in wild striped bass in the Chesapeake Bay. Heckert RA, et al. J Clin Microbiol. 2001 Feb; 39(2):710-5.

Study of Mycobacterium marinum at Louisiana's Coast

- Recruitment of minority students using scholarship programs
- Recovery of samples (water, soil, and fish) from Louisiana's coast, Oysterbay & LUMCOM, near Chauvin
- Isolation of microbes from samples (water, soil, and fish)
- Microbiological test for Mycobacteria (Acid-Fast Stain)
- Initiation of animal model in laboratory (Danio rerio)
- Continuation of efforts with other programs & students

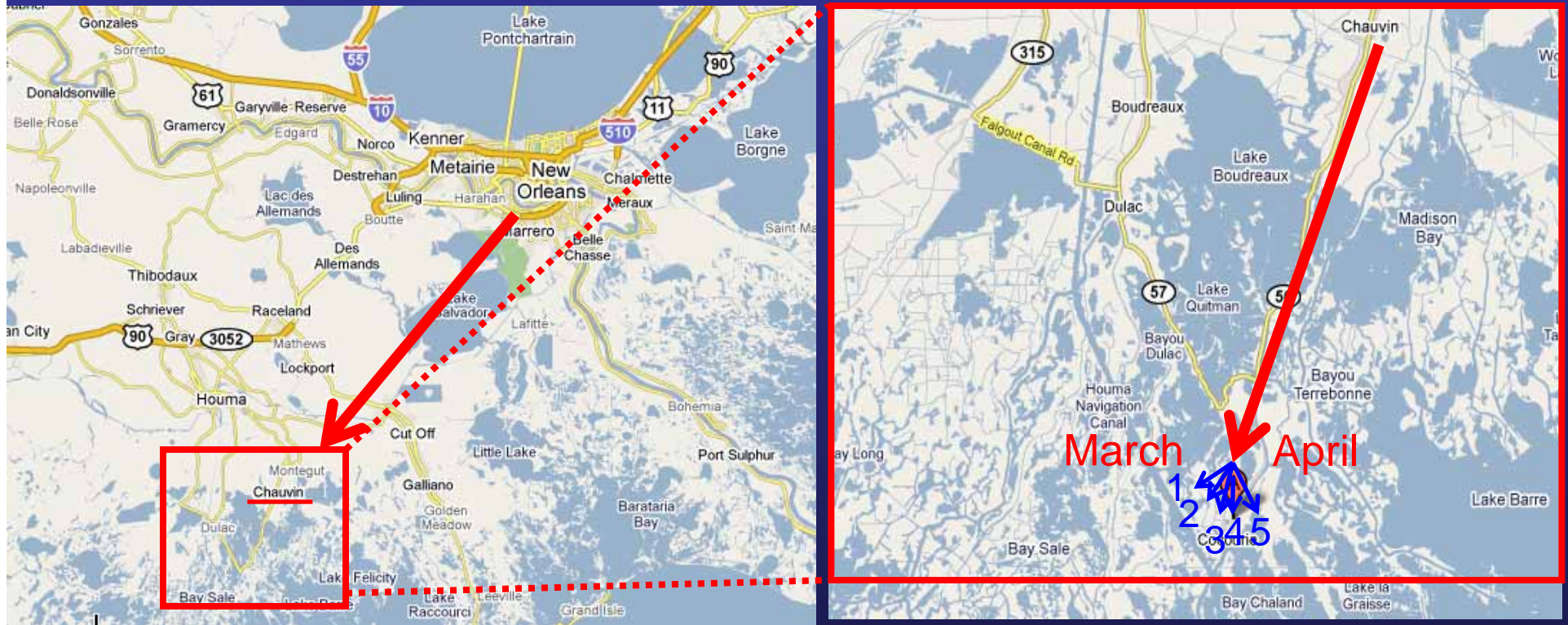
Recruitment of Students

- Recruitment of minority students for new project Spring 2009:
 - 2 male,
 - 1 female

- 2 students graduated,
- 1 student interested in continuation during Fall 2009

Retrieval of Specimen

- 2 fieldtrips (March, April 2009) near Chauvin and LUMCON, LA
4 - 5 different locations each time with multiple samples for each type of specimen (i.e. water, soil, and fish) using boat and trawler net



Laboratory Strain of *Mycobacterium marinum*



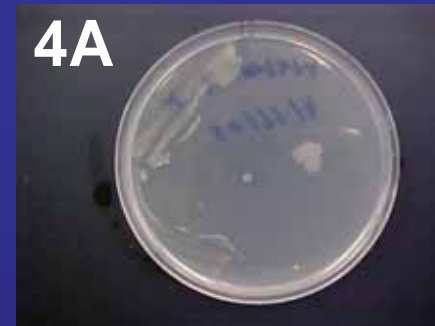
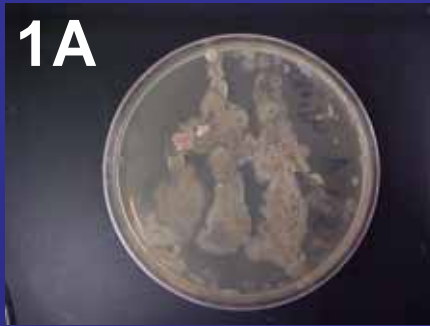
Chromogenic Growth of
Mycobacterium marinum.

J. Staropoli et al. 2008
Journal of Clinical Microbiology



Chromogenic colonies of *Mycobacterium
marinum* on Lowenstein Jensen Agar
(R. Johnson and I. Tietzel 2009, unpublished)

Isolated Microbes From Water, Fish, and Soil Samples



Isolated Microbes from soil samples.

Isolated Microbes from water samples. Isolated Microbes from fish samples.

Caught fish



Reference images of killifish (Fundulus)

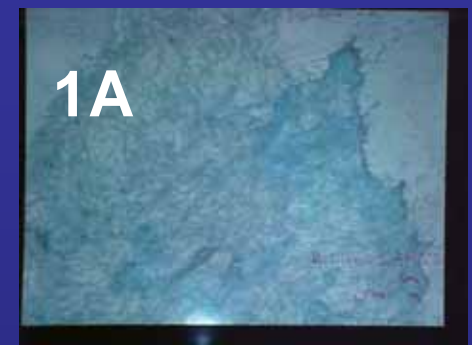
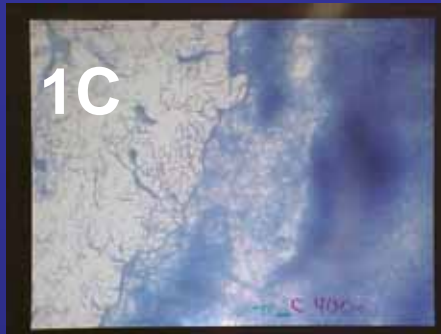


Acid-Fast Stain of Mycobacterium marinum Laboratory Strain



Positive Mycobacteria appear red and rod shaped.
Negative microbes appear blue. 400x magnification.

Acid-Fast Stain For Mycobacteria



Isolated Microbes from water samples. Isolated Microbes from killifish.
negative negative

Isolated Microbes from soil samples.
mostly negative

Summary of *Mycobacterium marinum* at Louisiana's Coast

- Recruited three minority students in CREST scholarships program to mentor hands-on training in coastal research projects: **Spring 2009**
- Collected and analyzed water, soil, and fish samples from Louisiana's coast, Oysterbay & LUMCOM, near Chauvin: **5 locations, 2 field trips; Killifish, Gulf Menhaden, Lizard fish, *Salvelinus alpinus***
- Isolation of microbes from samples (water, soil, and fish): **completed**
- Microbiological test for Mycobacteria (Acid-Fast Stain): soil and water negative; **Killifish negative**
- Initiation of animal model in laboratory (Acid-Fast Stain) : **on-going; *Danio rerio* control group is housed in own facilities.**
- Continuation of efforts with other programs & students:
3 students were sponsored by PESMaCT, SENS, MSEIP and studied *Mycobacterium marinum* in Gulf Menhaden, Lizard fish, *Salvelinus alpinus* during summer 2009. Some positive data suggest presence of Mycobacteria. Methods: Acid-Fast Stain & colony PCR; Other microbes studied: *Pfiesteria piscicida*, *Streptococcus iniae*, *Aeromonas salmonidae*.

Acknowledgements



CREST

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*Ecology - Analysis of soil & water

Frederick Tufuor, Rayon Golding. Analysis of soil & water

Ha'Wanna St. Cyr. Analysis of soil

Dr. I. Tietzel, Microbiology. Analysis of fish, soil, and water



University Louisiana Lafayette

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