

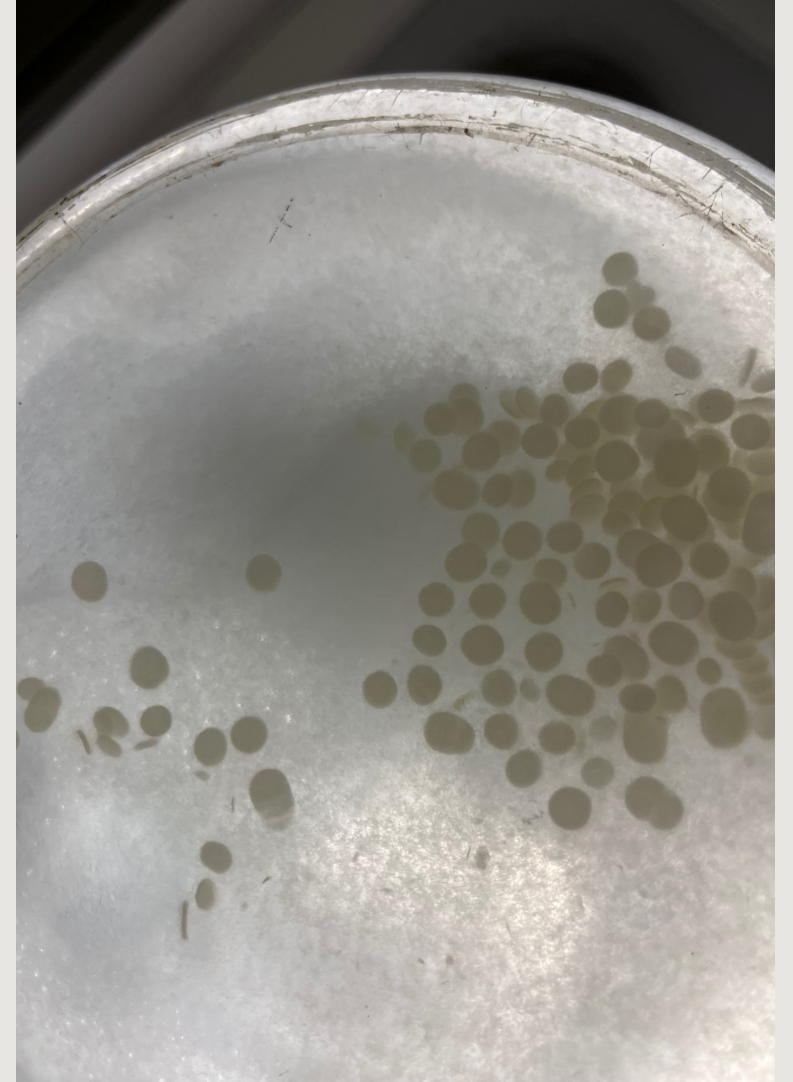
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Effects of Culture  
Conditions on  
Secondary Metabolite  
Production in  
*Teredinibacter turnerae*

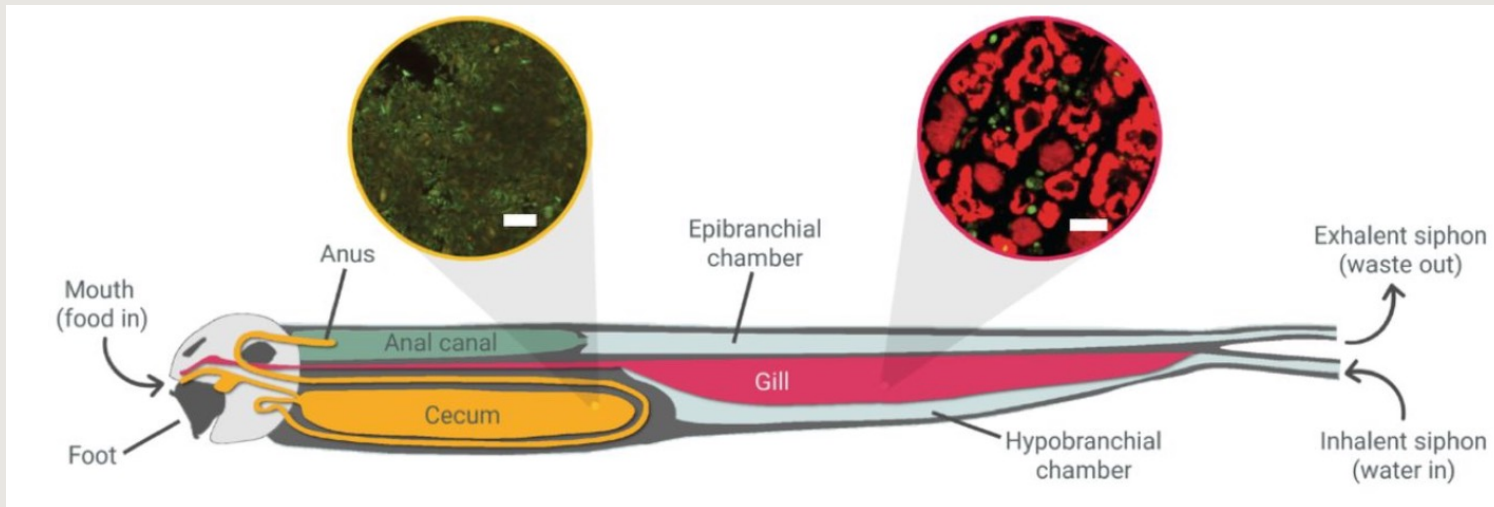
MARINA GERTON

SCHMIDT LAB - MEDICINAL CHEMISTRY

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# Shipworms

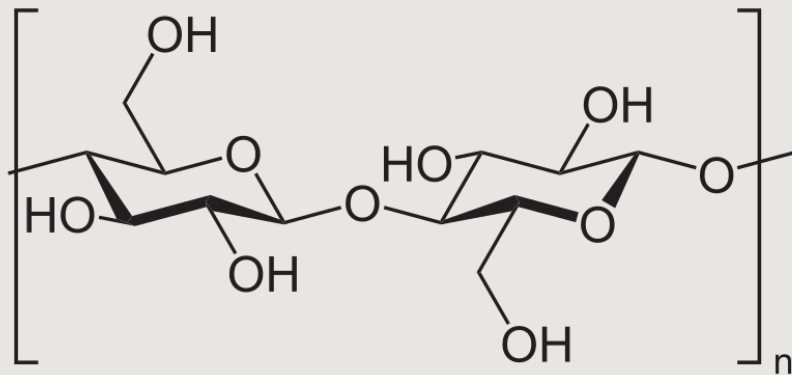


- Wood-eating marine bivalves
- Symbiotic bacteria in the gill tissue
- Near-sterile cecum

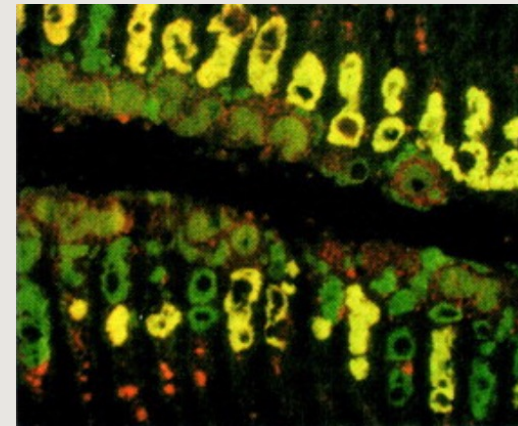
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# Shipworm-Bacteria Symbiosis

- Bacteria fix nitrogen, provide cellulases and secondary metabolites for shipworms
  - Helps shipworms digest cellulose and hypothetically prevent glucose scavenging
- Bacteria reside in specialized cells called bacteriocytes
- Lab culturing conditions vary greatly from *in situ* environment



Cellulose



Symbionts in gill tissue

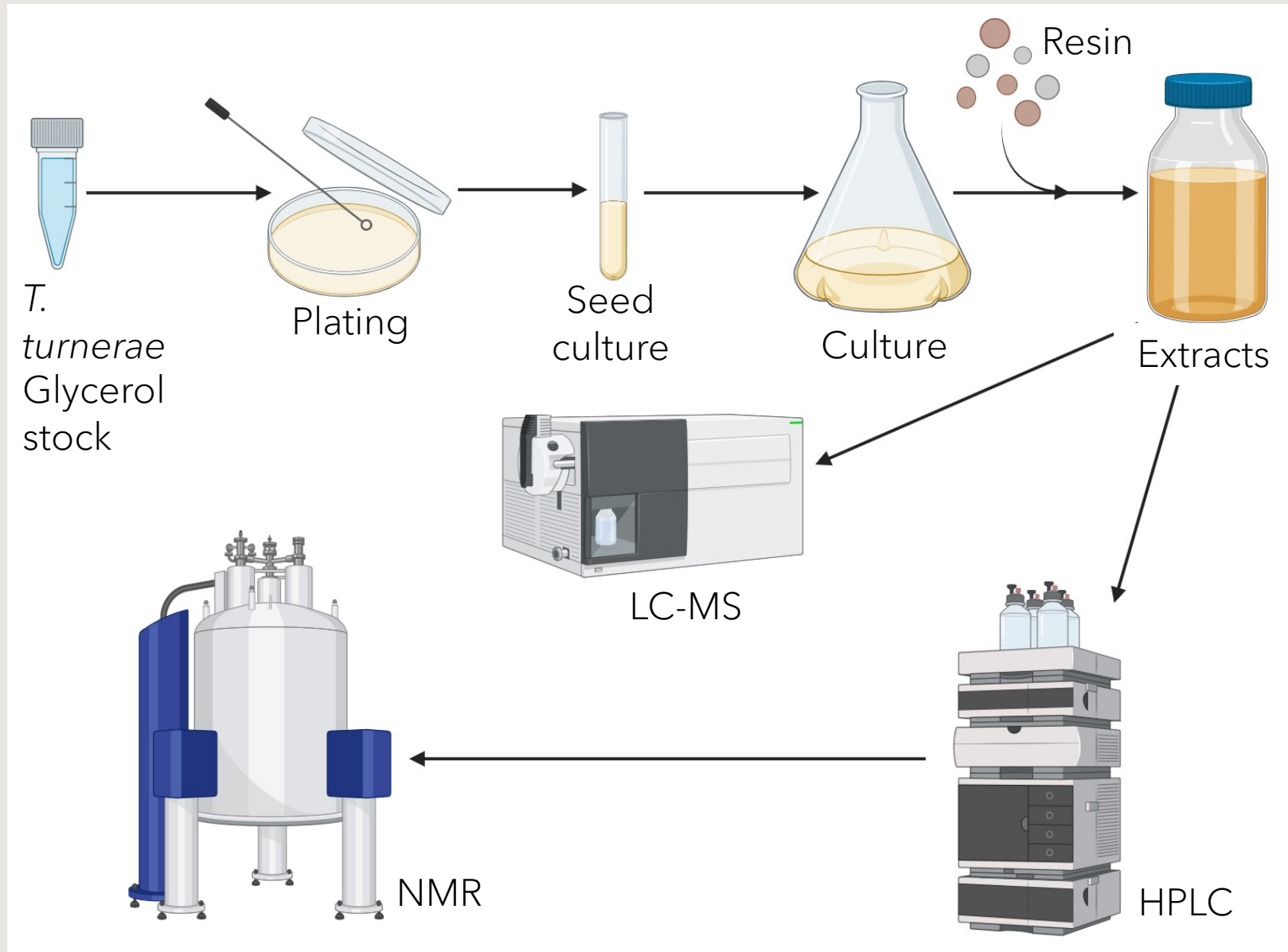
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# Three Chapters

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- Selecting standard media conditions
    - Examining growth times and media components
  - Exploring culturing conditions and carbon sources
    - Using various sugars and clam extracts
  - Waste streams as carbon sources
    - Paper and plant waste as carbon sources
-

# General Experimental Flow



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# Chapter 1

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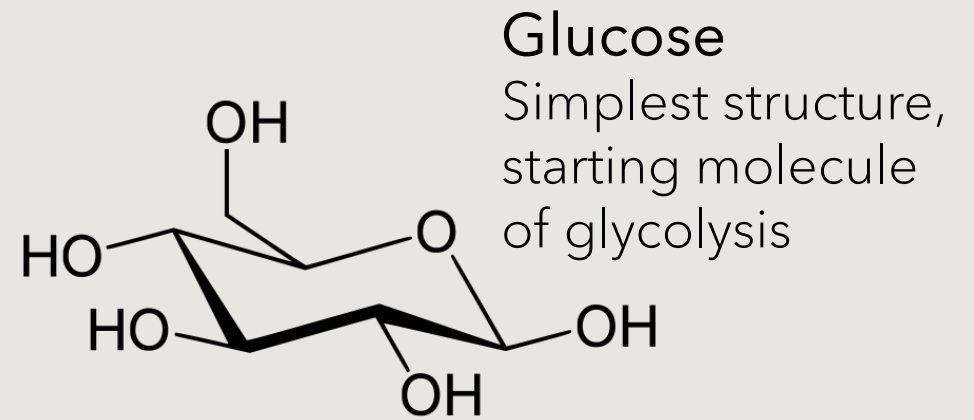
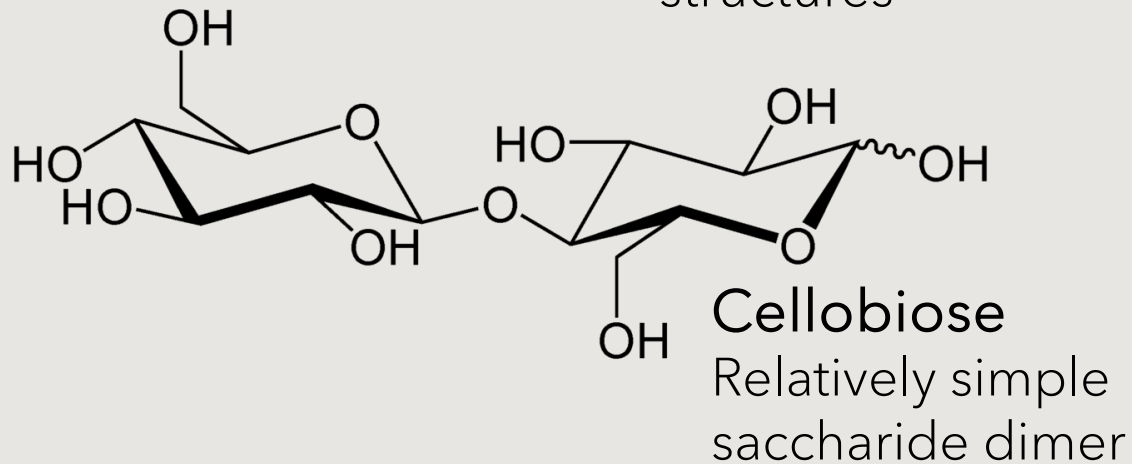
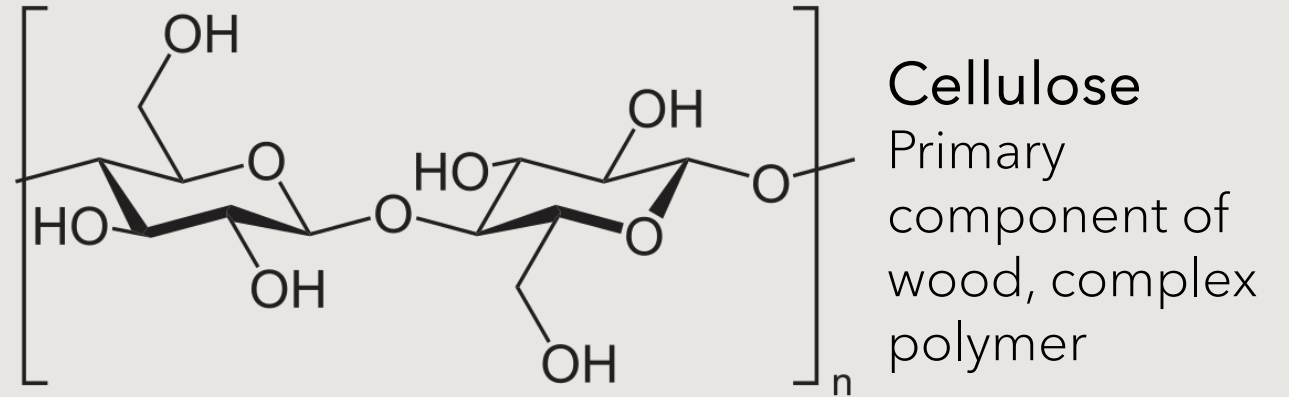
Component (mL)	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5	Condition 6
ASW	750	750	--	--	--	--
Instant Ocean	--	--	750	750	750	750
10% NH <sub>4</sub> Cl	2.5	2.5	2.5	2.5	2.5	2.5
10% Cellulose	20	--	20	--	20	--
10% Sucrose	--	50	--	50	--	50
M&M mix	15	15	15	15	--	--
HEPES	20	20	20	20	20	20
25mg/mL Fe-EDTA	0.15	0.15	0.15	0.15	0.15	0.15
MilliQ H <sub>2</sub> O	192.35	162.35	192.35	162.35	207.35	177.35

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# Chapter 2

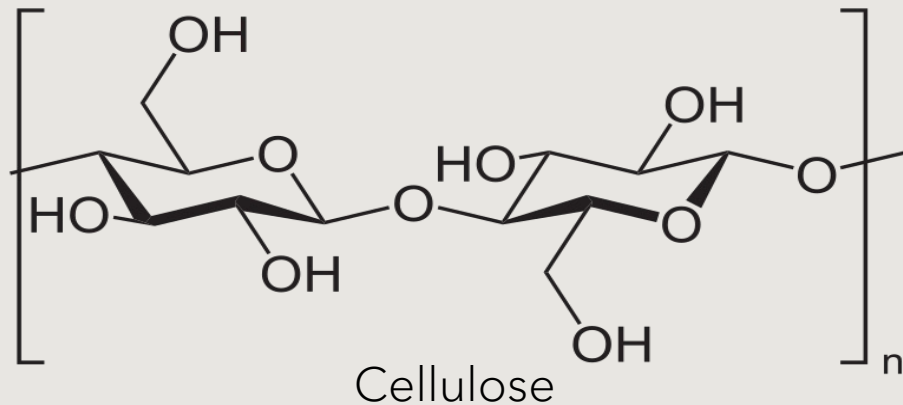


**Wood  
(Sawdust)**  
Form of carbon  
consumed by  
the shipworms,  
most complex  
of the 4  
structures



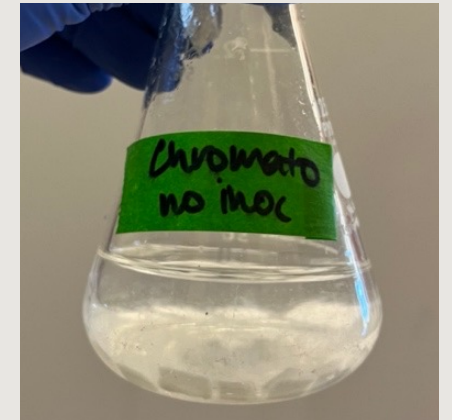
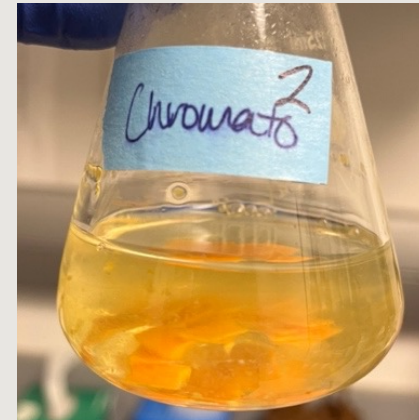
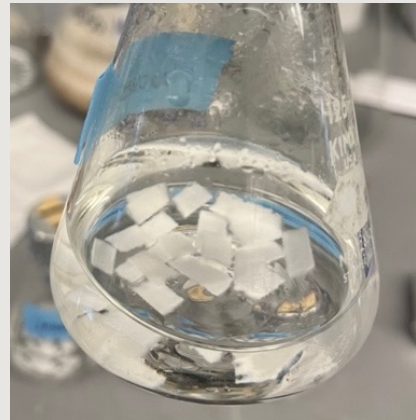
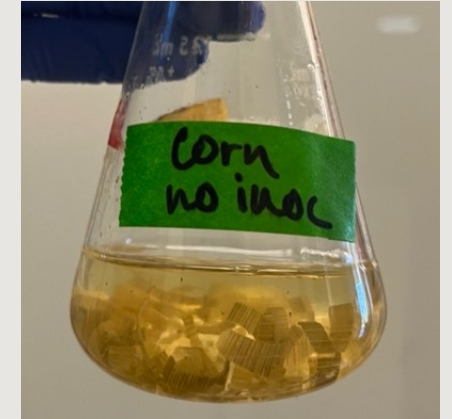
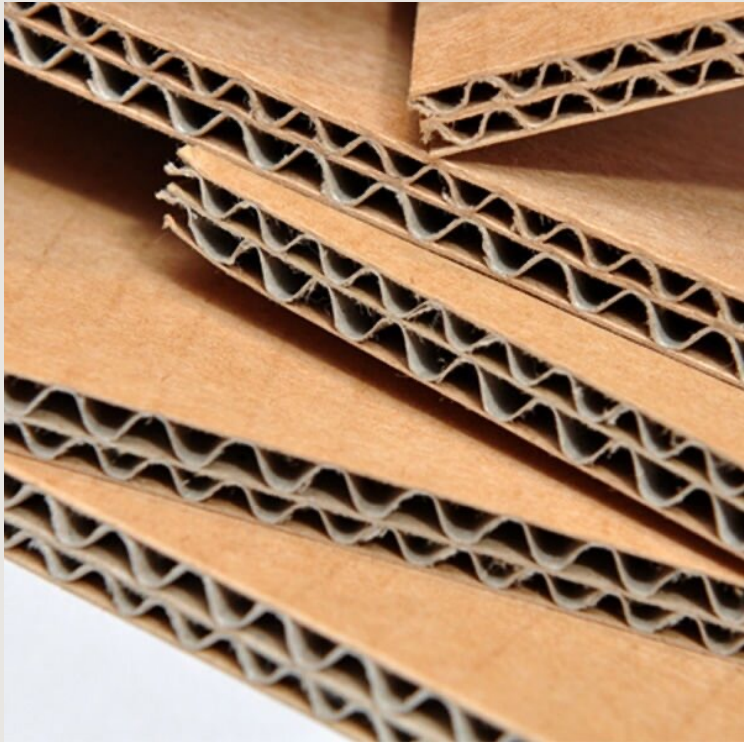
# Chapter 2

- Cellulose only carbon source
- Extracts from gill tissue and rest of organism
- 2 concentrations of each tested





# Chapter 3



Examined printer, chromatography, waste, and mulberry papers; grass, leaves, rose stems, corn husks, and sawdust; and coffee sleeve, corrugated cardboard, ice cream carton, and business card

---

# Acknowledgements

## Schmidt Lab

PI: Eric Schmidt, Ph.D.

Bailey Miller, Ph.D.

Zhenjian Lin, Ph.D.

Paul Scesa, Ph.D.

Feng Li, Ph.D.

Rong Chen, Ph.D.

Jungu Kim, Ph.D.

Youjung Sung

Albebson Lim

Noel Lacerna

Aarthi Venugopalan

Jared Seale

## Former Lab Members

Changshan Niu, Ph.D.

Snigdha Sarkar, Ph.D.

Noemi Paguigan, Ph.D.

Ying Cong, Ph.D.



# Acknowledgements

The Honors College

The National Institutes of Health

- R01, R35, and U19 grants

The Office of Undergraduate Research

- Undergraduate Research Opportunities Program

The College of Science

- Departments of Chemistry, Biology, and Math

The College of Pharmacy

- Department of Medicinal Chemistry



L. S. SKAGGS PHARMACY INSTITUTE