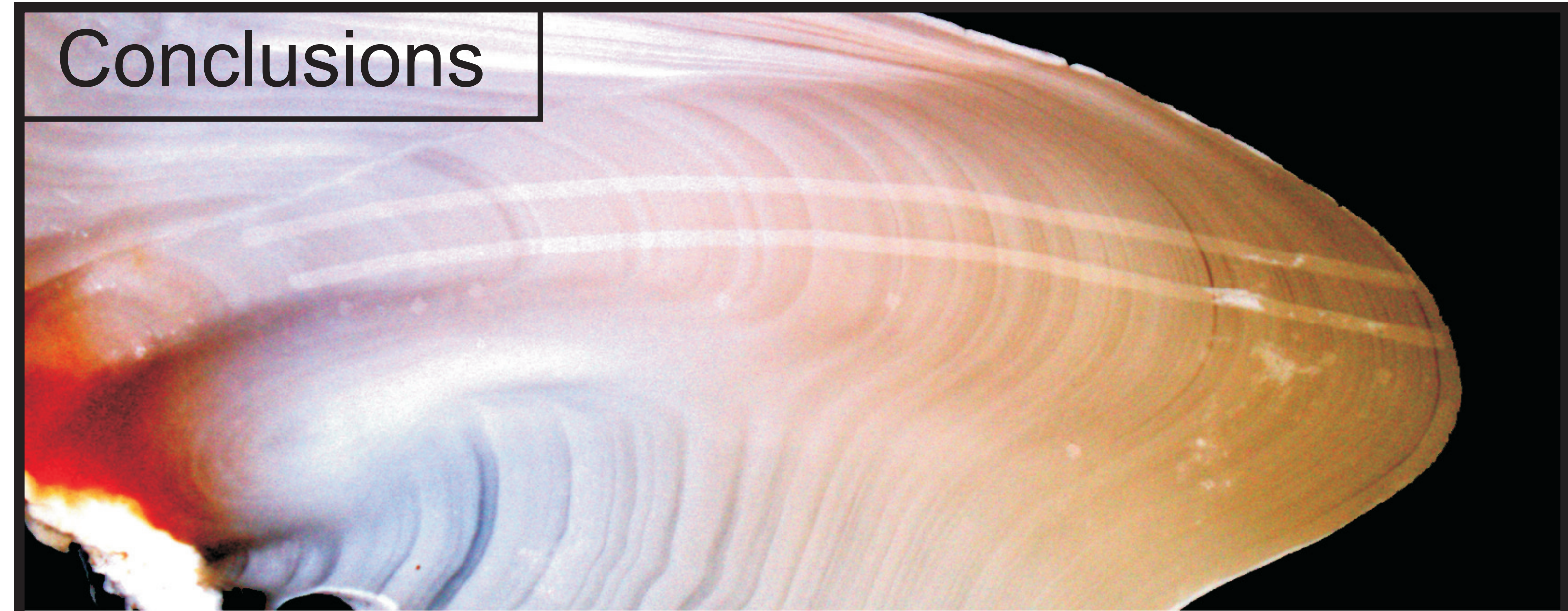


## Conclusions



### Target TE determines sample pre-treatment:

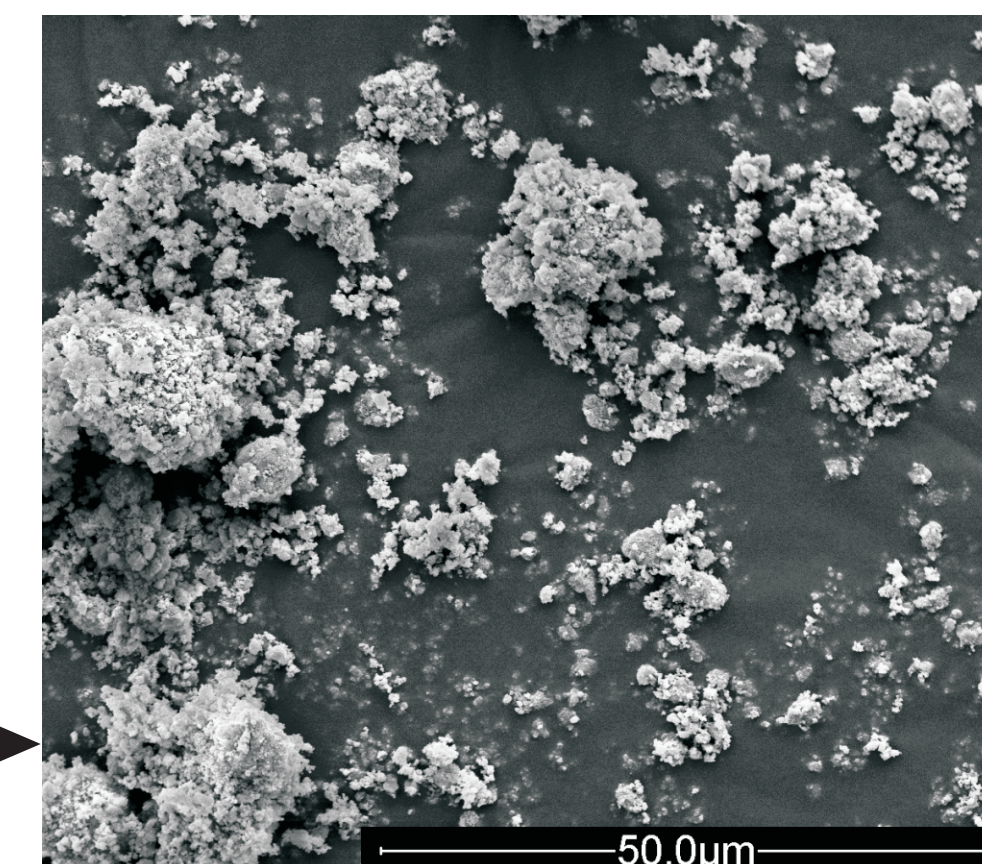
- **Sr/Ca**  
=> remove organic matrix prior to measurements
- **Mg/Ca, Ba/Ca, and Mn/Ca**  
=> avoid sample treatment  
=> contamination or reallocation

## Methods

*A. islandica* shell  
» one valve

cleaning + grinding

shell powder  
» grain size ~30µm



division

13 subsamples  
» 12 treatments + control

0	no treatment
1	washing only
2	Acetone
3	H <sub>2</sub> O <sub>2</sub>
4	NaOH
5	NaOCl
6	Mucosol
7	Acetone+H <sub>2</sub> O <sub>2</sub> +Acetone
8	Acetone+NaOH+Acetone
9	Acetone+NaOCl+Acetone
10	Acetone+Mucosol+Acetone
11	Acetone+H <sub>2</sub> O <sub>2</sub> +NaOH+Acetone
12	Acetone+H <sub>2</sub> O <sub>2</sub> +NaOH+NaOCl+Mucosol+Acetone

TE and N measurements  
» Mg/Ca, Sr/Ca, Ba/Ca, Mn/Ca

## Rationale

Numerous attempts to correlate trace element (TE) concentrations in biogenic carbonates with environmental parameters led to contradictory results. The organic matrix may be one reason for these inconsistencies.

Proxy analyses imply that physical processes control trace element incorporation in biogenic carbonates. Thus, the biogeochemistry of the carbonate and environmental parameters during shell formation are directly connected. Incorporation of trace elements into the organic matrix, however, is also controlled by physiological processes – **that is the problem!**

We evaluate the effect of the organic matrix on trace element concentrations in biogenic carbonates. We use bivalve shell powder (*Arctica islandica*) to examine the effect of 12 treatments on:

- TE concentrations (Mg/Ca, Sr/Ca, Ba/Ca, Mn/Ca) AND
- Organic matter content (N content)

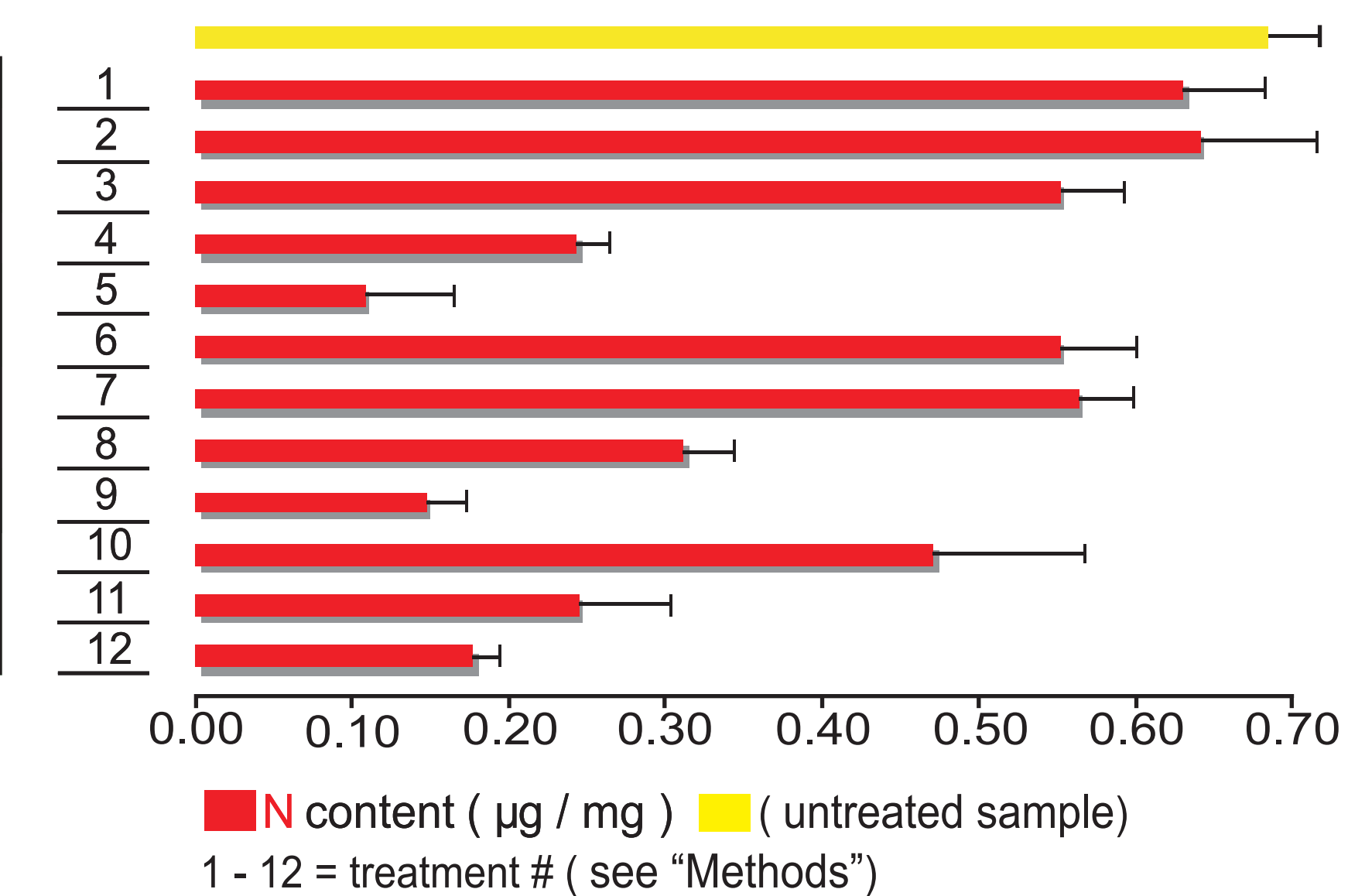
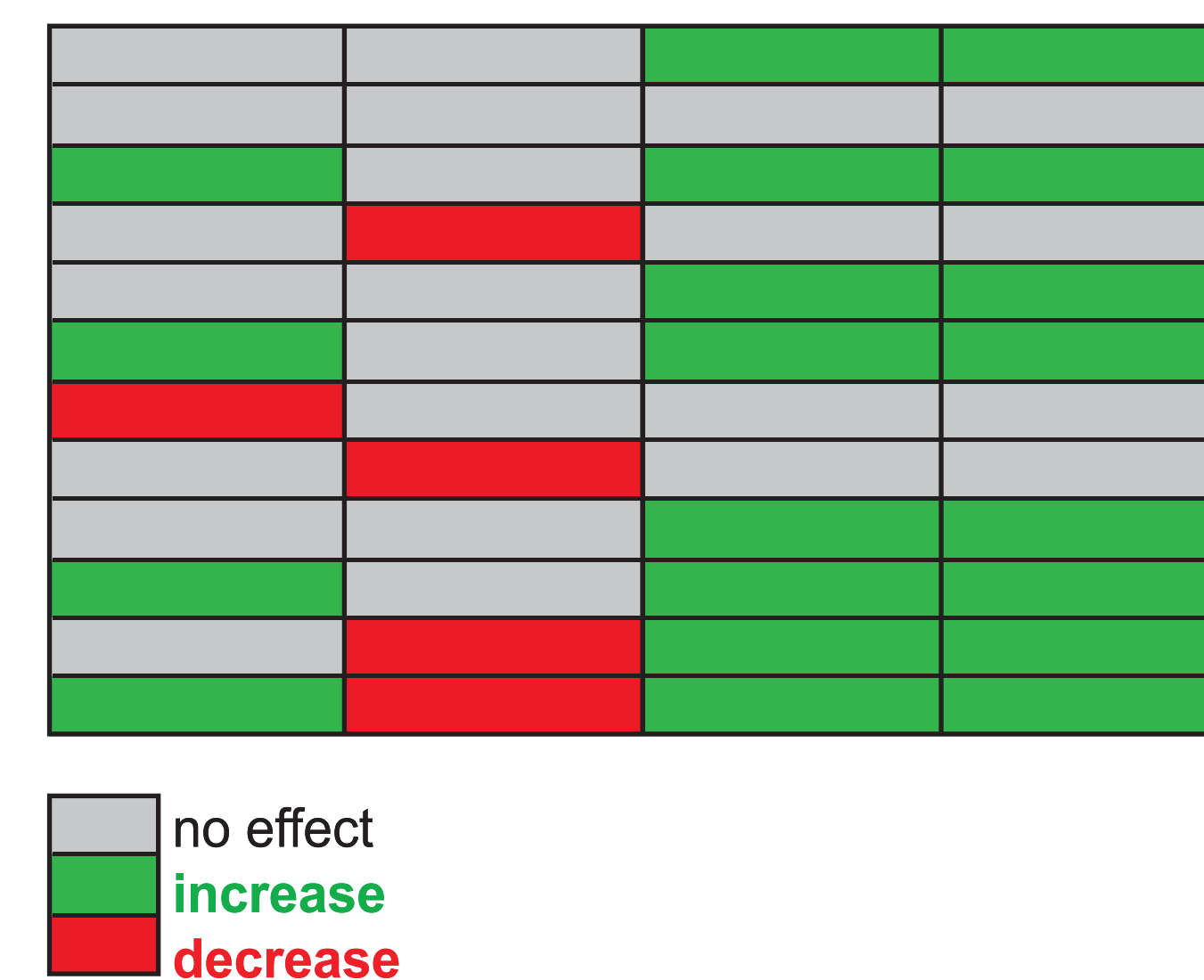
## Results

### TE concentrations

sample treatment causes changes:

- Sr/Ca:** NaOH treatment  
=> significant decrease
- Mg/Ca, Ba/Ca, Mn/Ca:**  
=> no clear pattern  
=> tendency to increase

Mg/Ca Sr/Ca Ba/Ca Mn/Ca

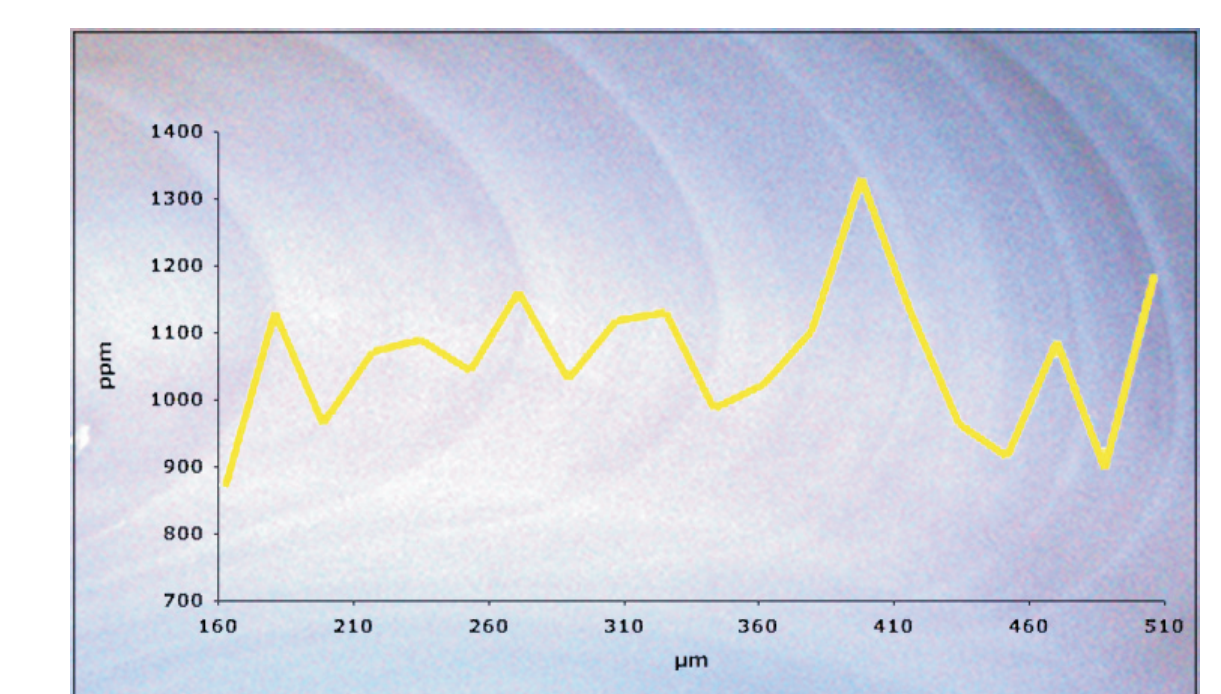
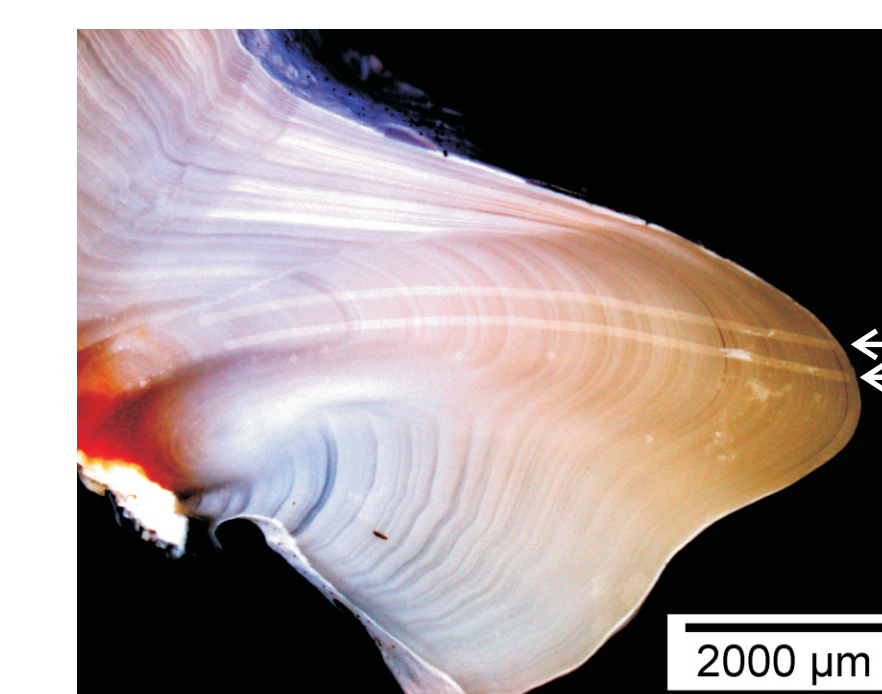
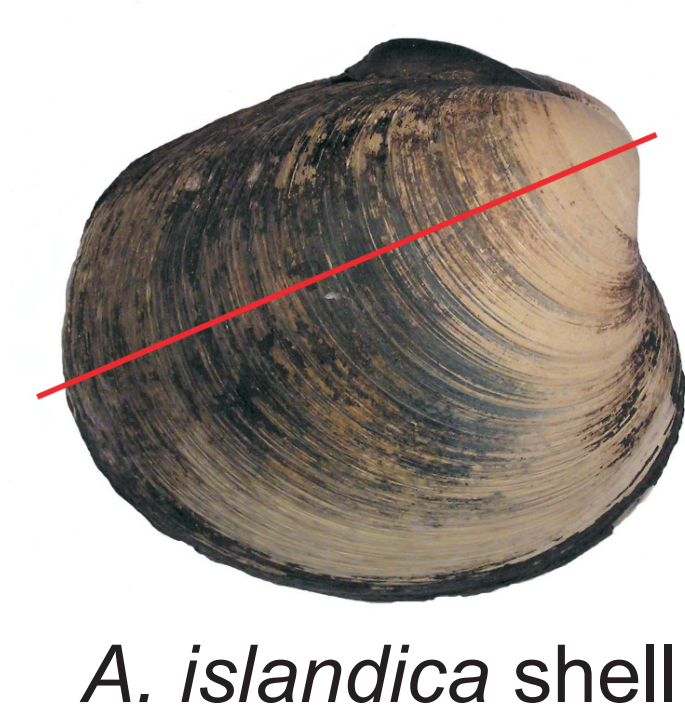


### Organic matter content

most efficient removers:  
=> NaOCl (treatment# 5,9,12)  
=> NaOH (treatment# 4,8,11,12)

## What's next

1. Can we reproduce our analyses with intact shells => same pattern?



2. Combine spatial TE map (LA-ICP-MS, microprobe) with spatial mapping of organic matter (RAMAN)