LA-UR-23-26696

Approved for public release; distribution is unlimited.

Title:	Evolving the next generation of algal crops
Author(s):	Pentz, Jennifer Taryn
Intended for:	Science in 3 presentation
Issued:	2023-06-21

Los Alamos NATIONAL LABORATORY

Evolving the next generation of algal crops

Jennifer T. Pentz

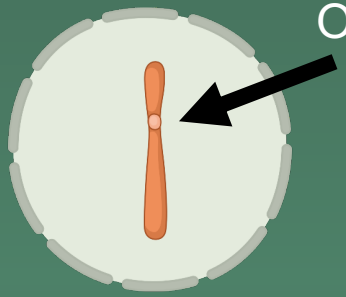
B-GEN Genomics and Bioanalytics

June 28, 2023

Problem: Algae we use now is not productive enough

Problem: Algae we use now is not productive enough

Algae are haploid



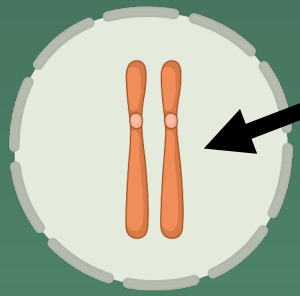
1N

Problem: Algae we use now is not productive enough

Algae are haploid

1N

Humans are diploid



2N

Problem: Algae we use now is not productive enough

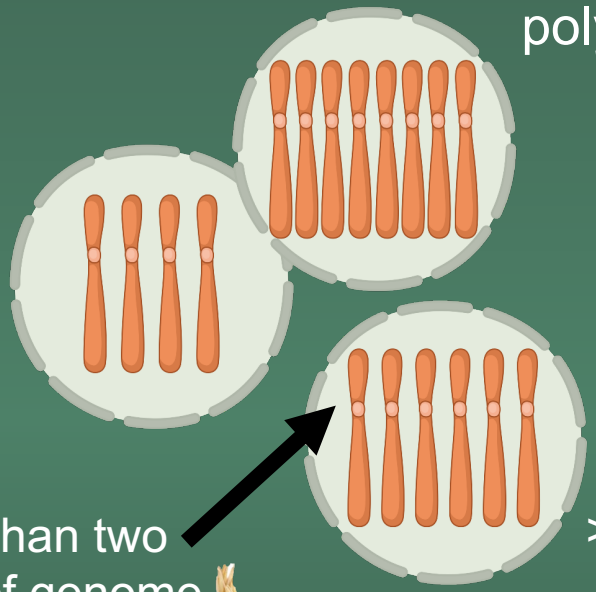
Algae are haploid

1N

Humans are diploid

2N

Plants are polyploid

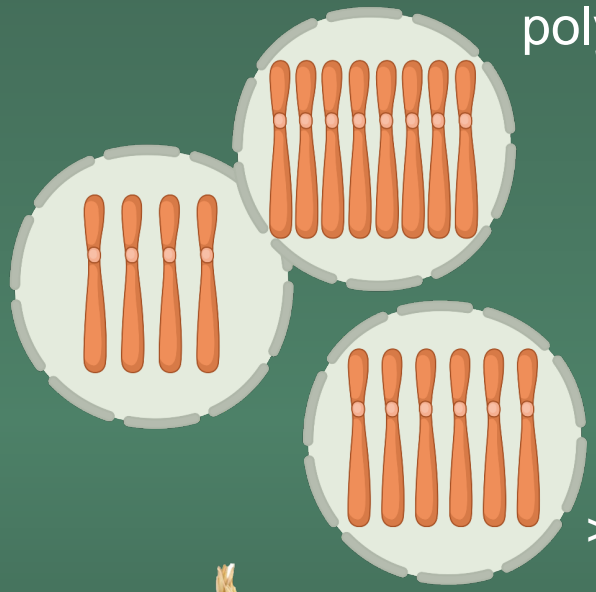


More than two copies of genome

> 2N

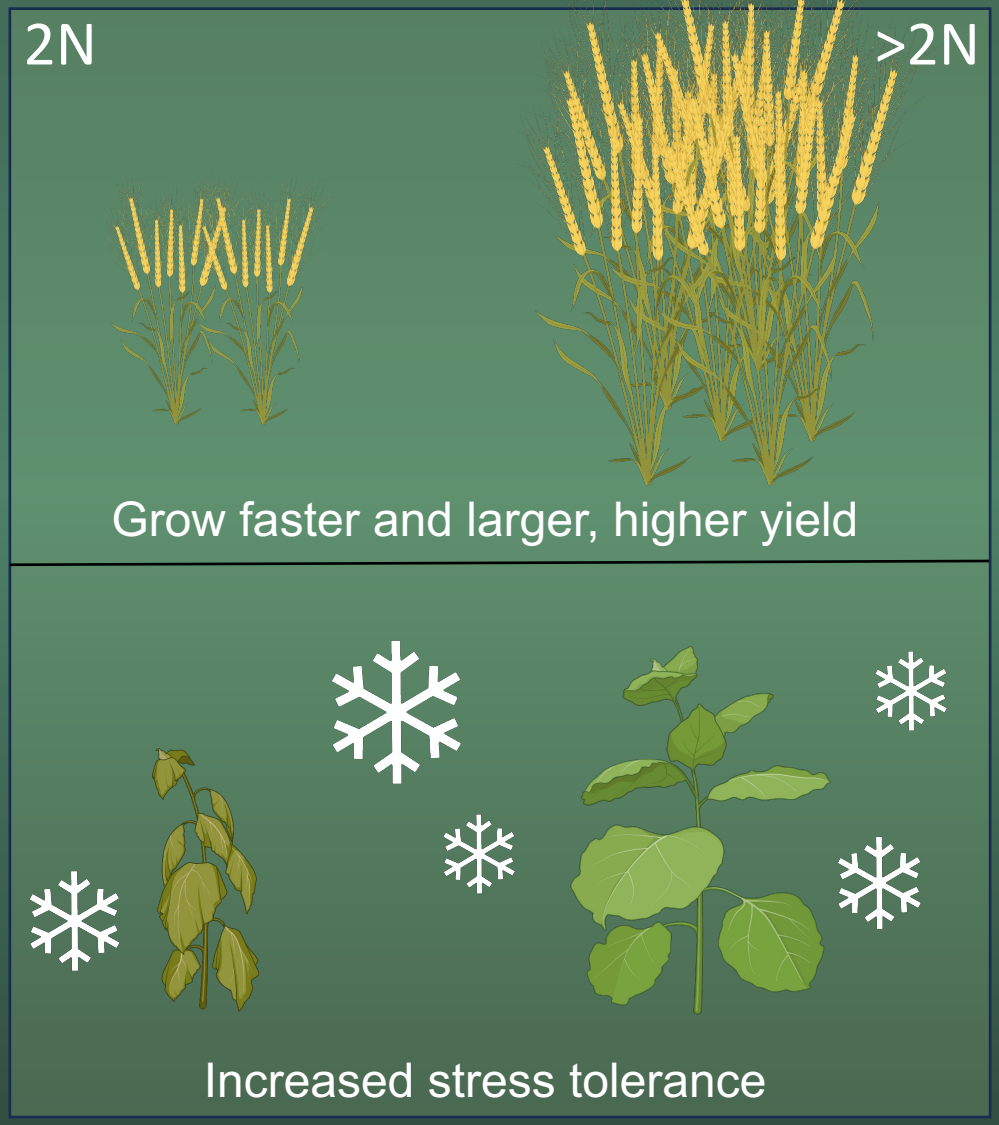
In nature, polyploidy helped plant crops domesticate

Plants are polyploid

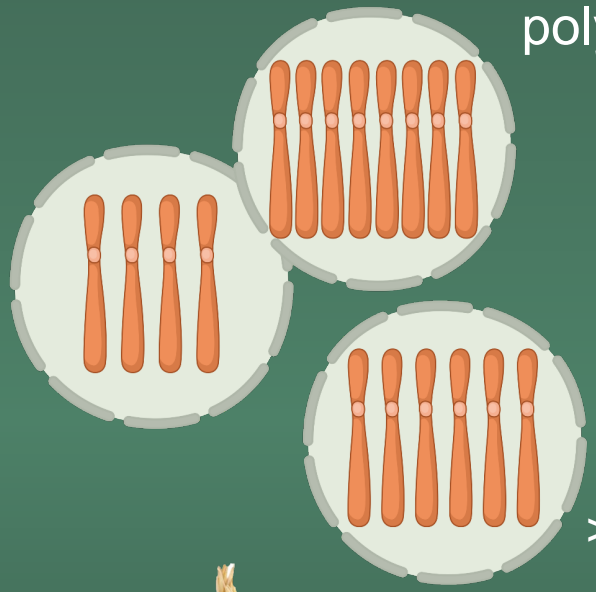


> 2N

In nature, polyploidy helped plant crops domesticate



Plants are polyploid



Doubling the genome of algae in the lab

Remember back to biology…
Normal cell division

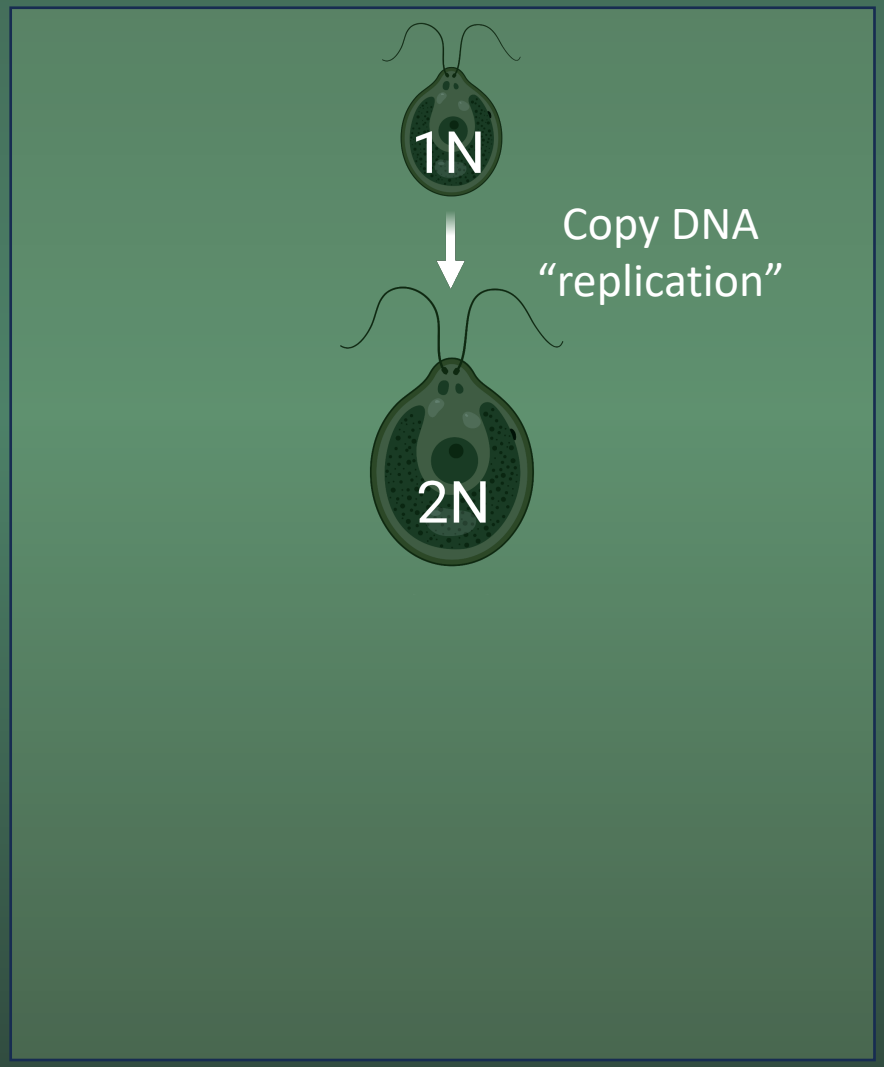
Doubling the genome of algae in the lab

Remember back to biology…
Normal cell division

# of genomes →

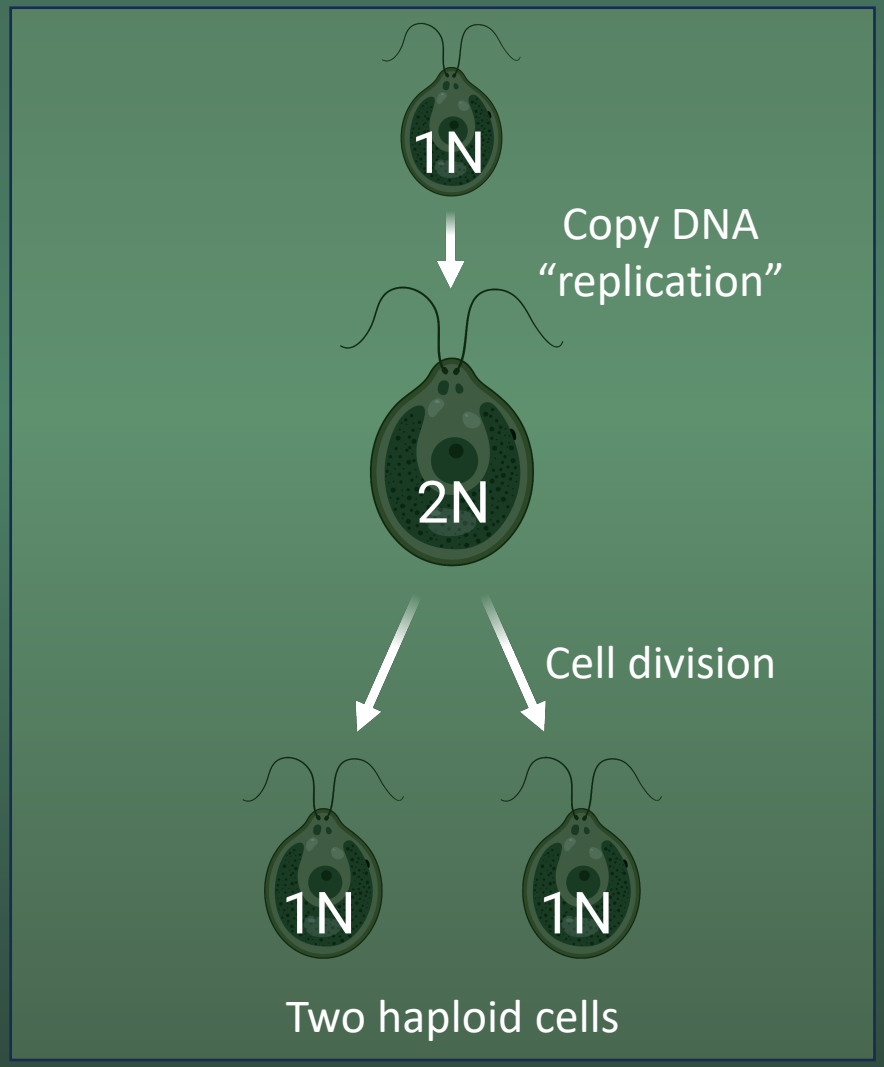
Doubling the genome of algae in the lab

Remember back to biology…
Normal cell division



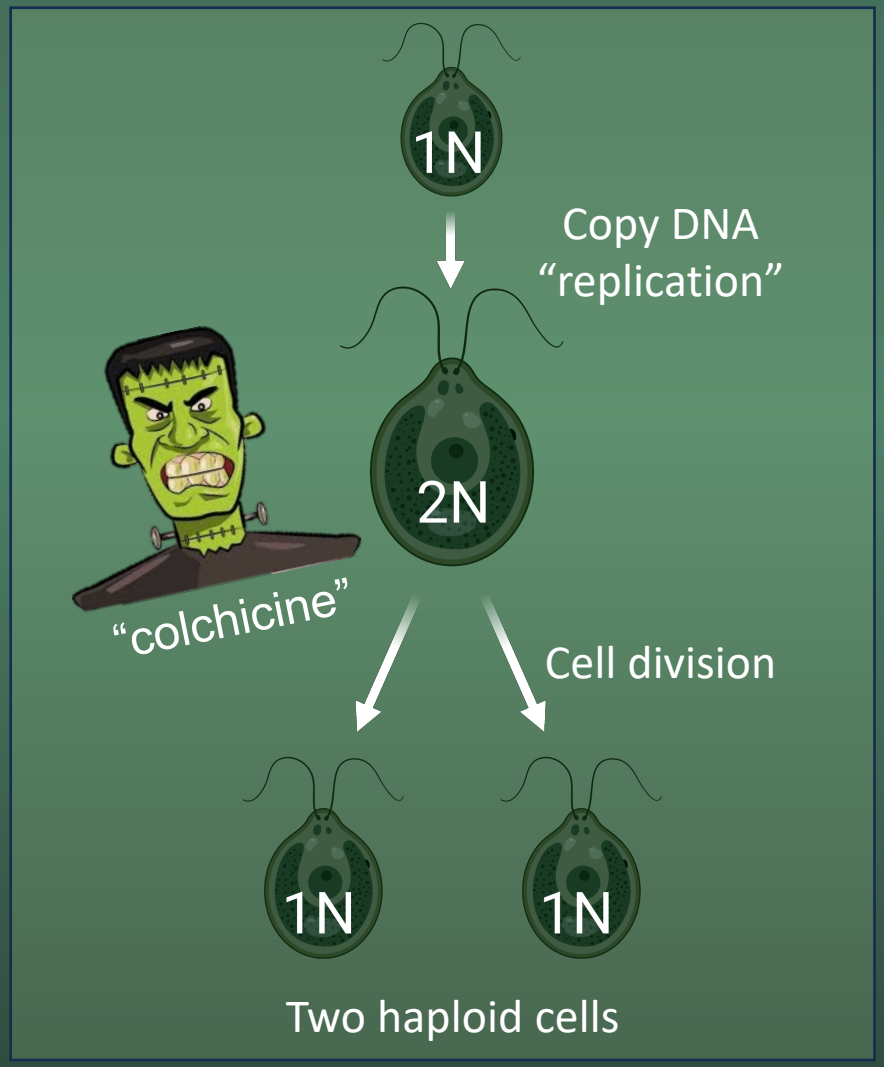
Doubling the genome of algae in the lab

Remember back to biology…
Normal cell division



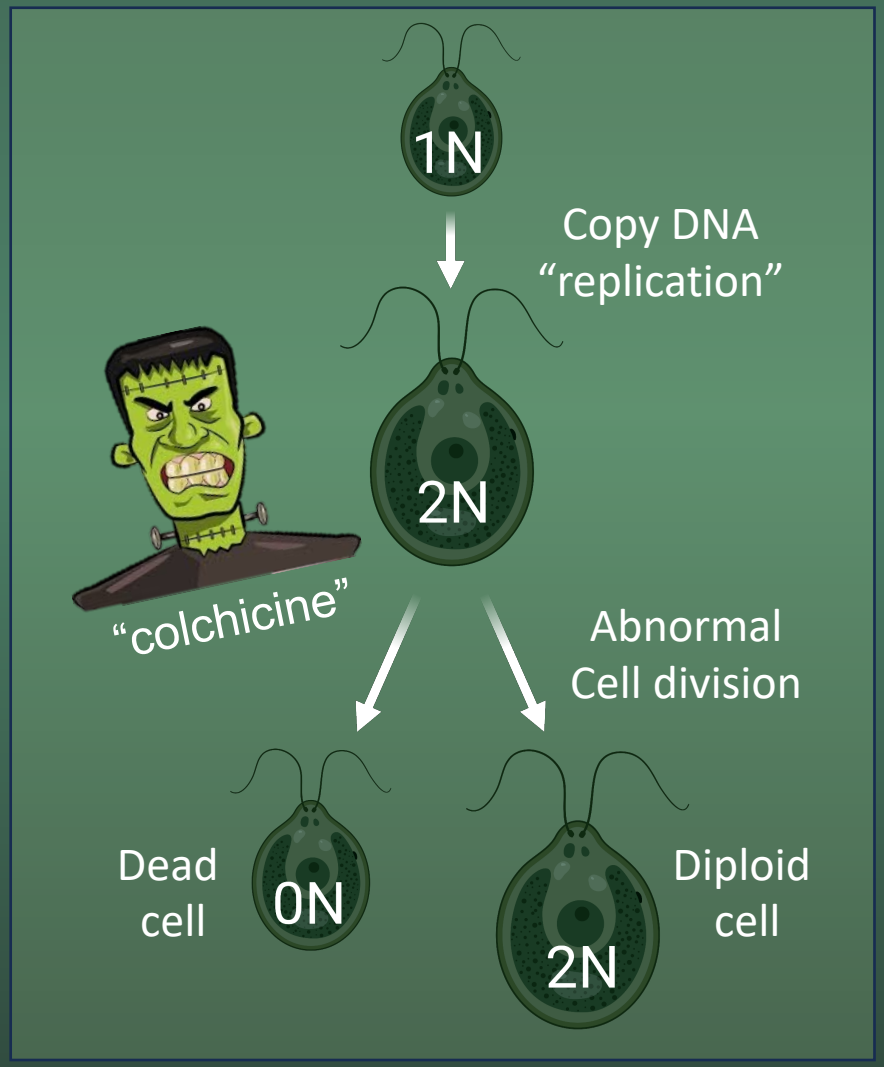
Doubling the genome of algae in the lab

Remember back to biology…
Normal cell division



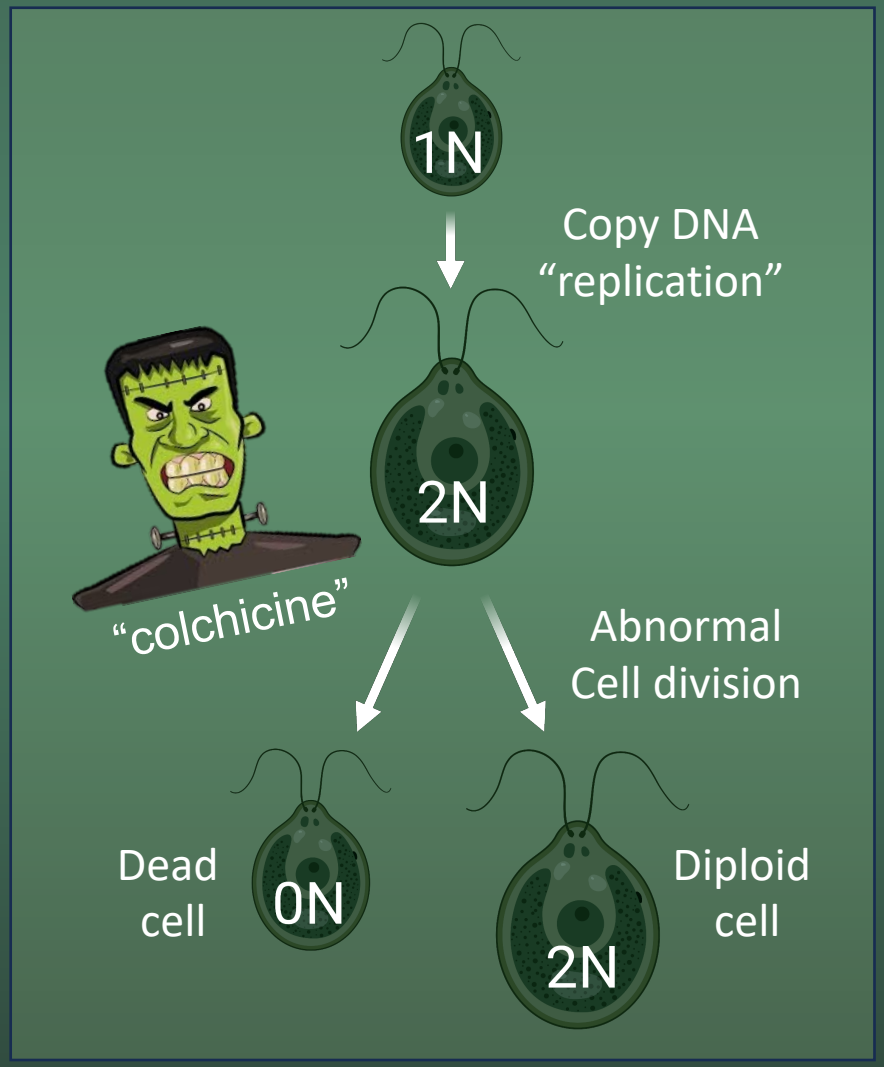
Doubling the genome of algae in the lab

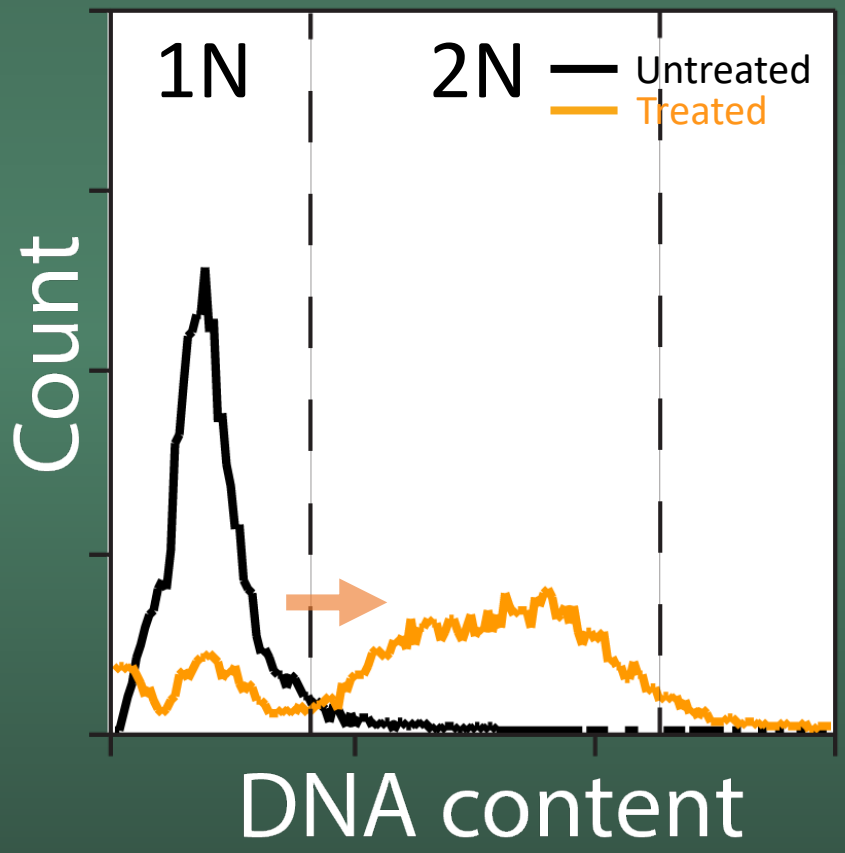
Remember back to biology…
Normal cell division



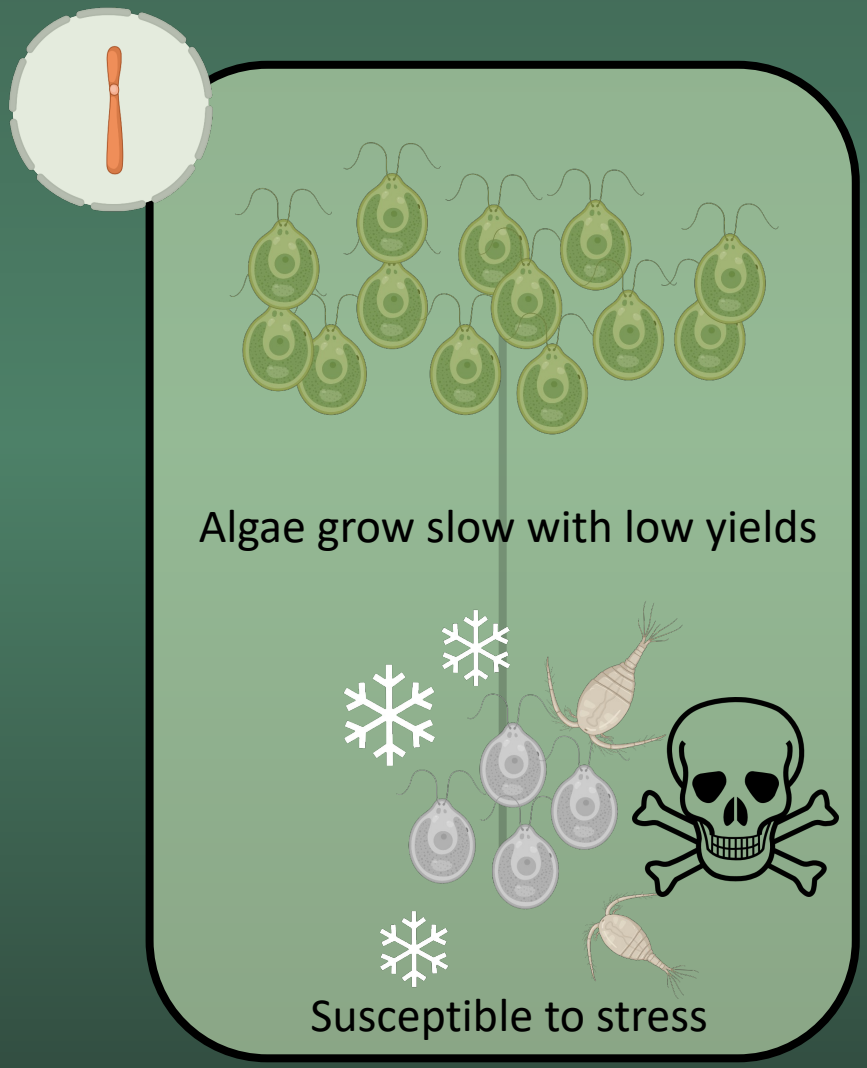
Doubling the genome of algae in the lab

Remember back to biology…
Normal cell division





Diploid algae can make algae ponds stronger and more resilient



Thank you!

Erik R. Hanschen

Claire Sanders

Omar Holguin

- Claudia Galvan
- Harmanpreet Kaur

Los Alamos NATIONAL LABORATORY

NEW MEXICO STATE UNIVERSITY N M S U 1888

DEPARTMENT OF ENERGY · UNITED STATES OF AMERICA ·