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Title: Evolving the next generation of algal crops

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Evolving the next generation of algal crops

Jennifer T. Pentz

B-GEN Genomics and Bioanalytics

June 28, 2023

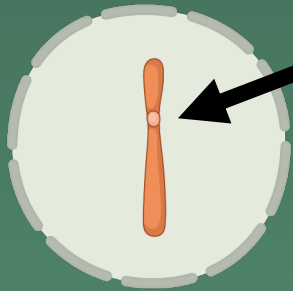


**Problem: Algae we use now is not
productive enough**

Problem: Algae we use now is not productive enough

Algae are
haploid

Only one copy
of genome



1N

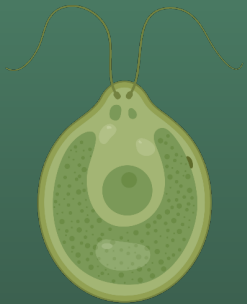


Problem: Algae we use now is not productive enough

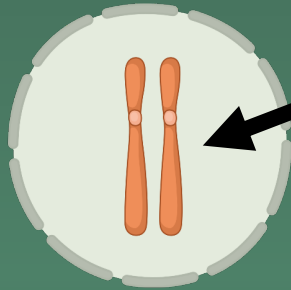
Algae are
haploid



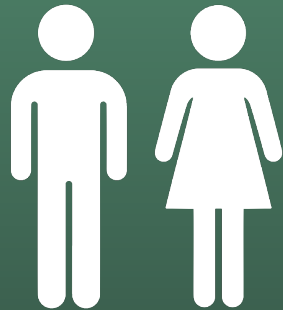
$1N$



Humans are
diploid



$2N$



Two copies
of genome



Problem: Algae we use now is not productive enough

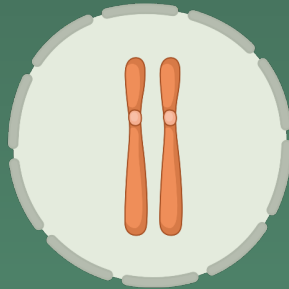
Algae are haploid



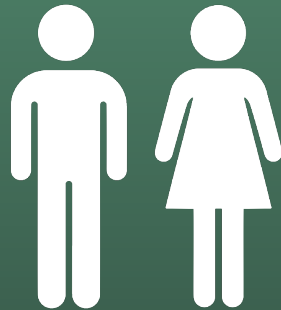
1N



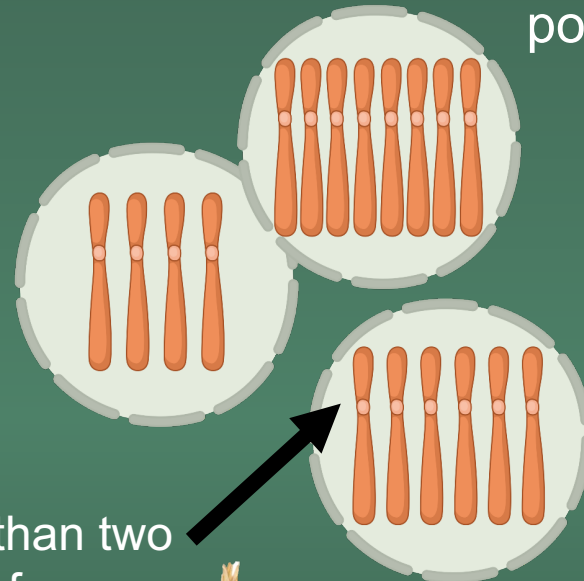
Humans are diploid



2N



Plants are polyploid



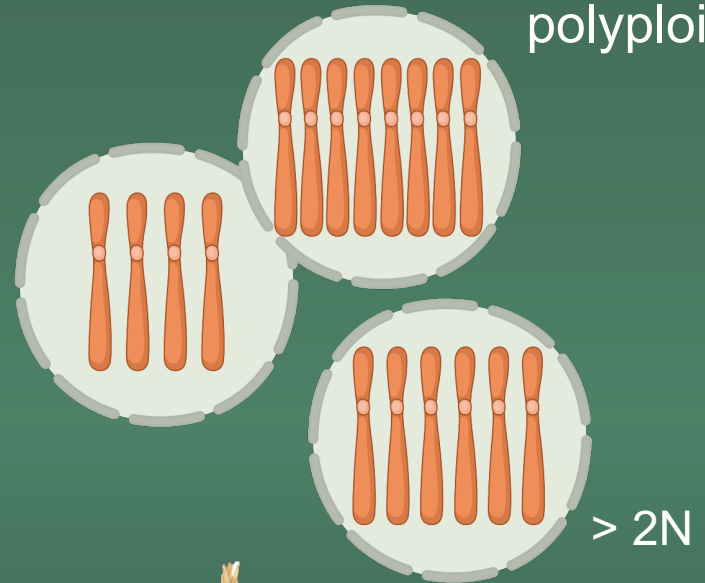
> 2N

More than two
copies of genome



In nature, polyploidy helped plant crops domesticate

Plants are
polyploid



In nature, polyploidy helped plant crops domesticate

$2N$

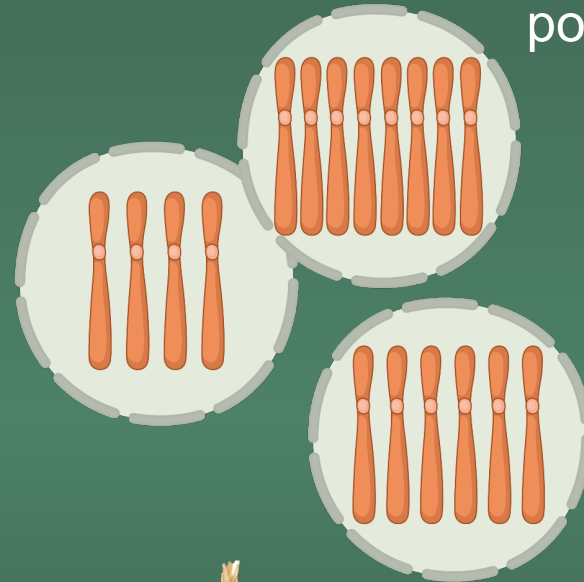


$>2N$



Grow faster and larger, higher yield

Plants are
polyploid



$> 2N$



Increased stress tolerance



Doubling the genome of algae in the lab

Remember back to biology...
Normal cell division



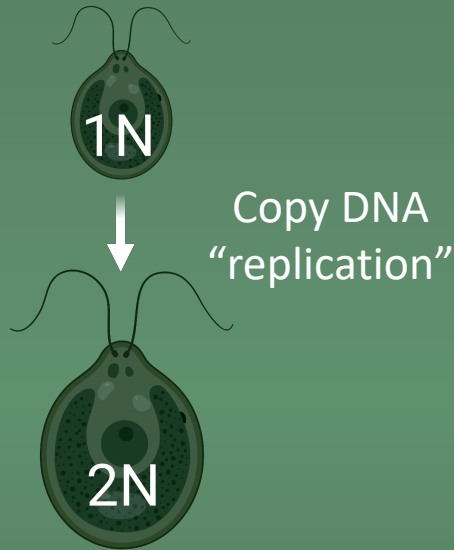
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Remember back to biology...
Normal cell division



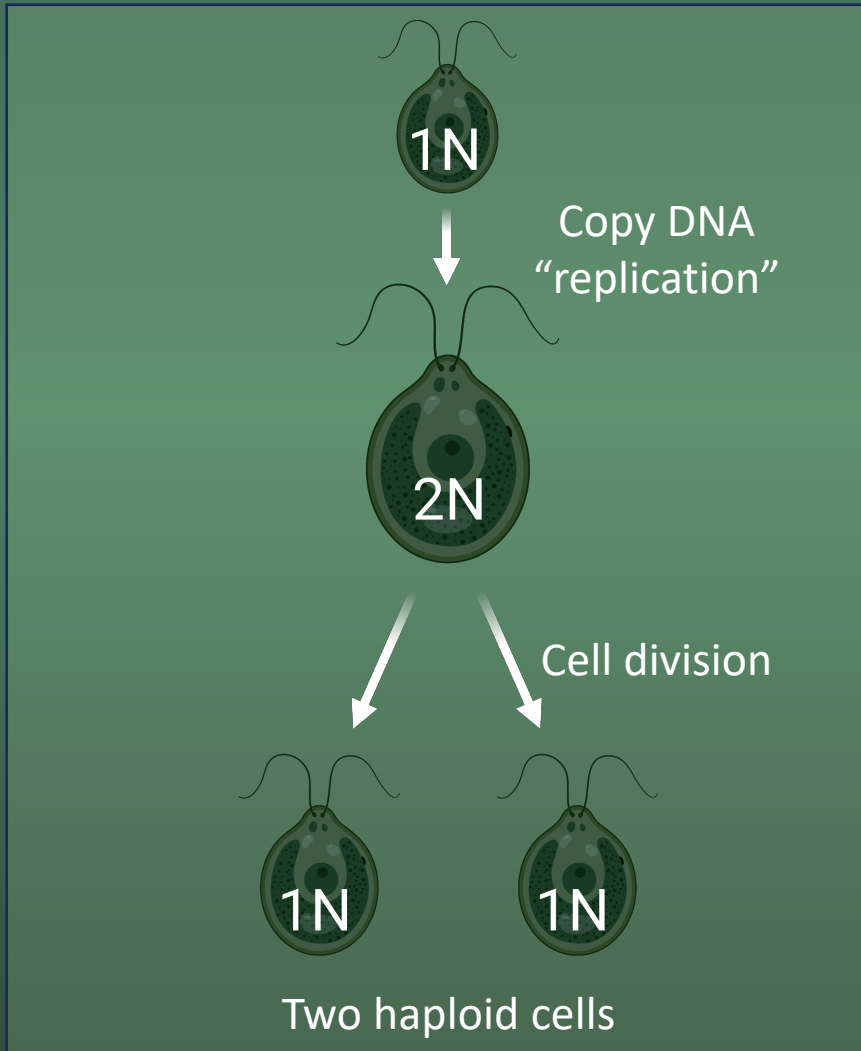
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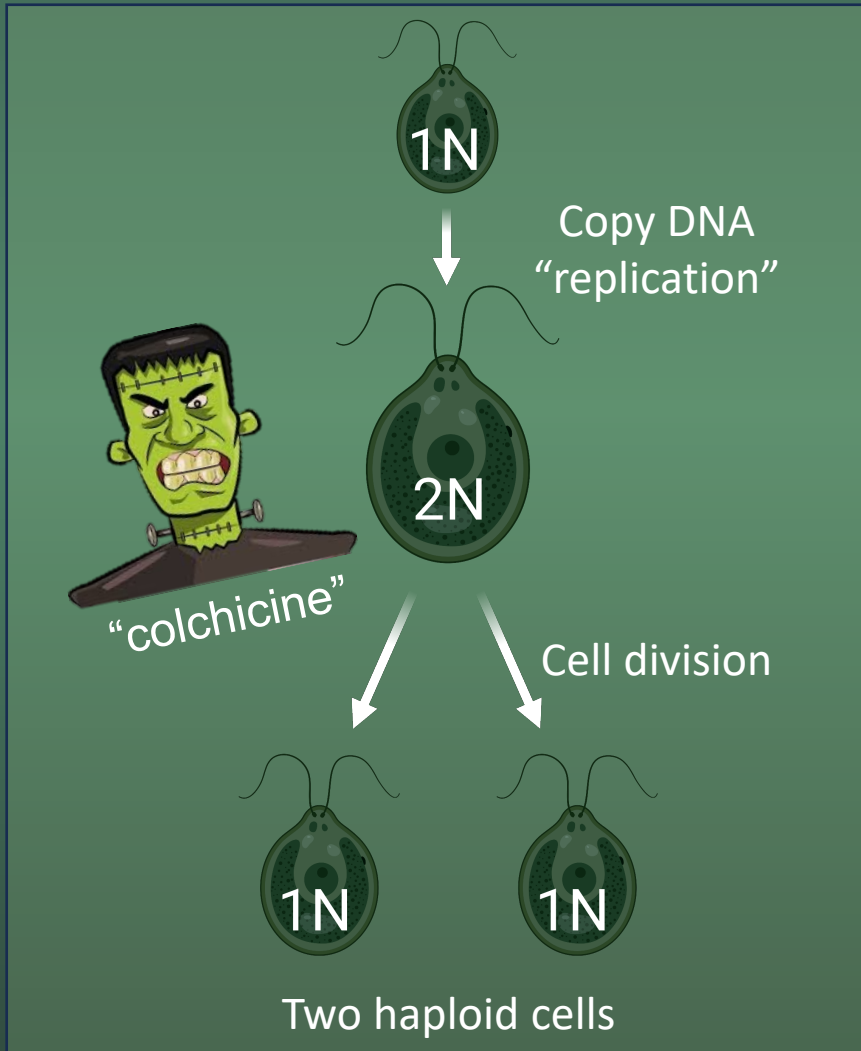
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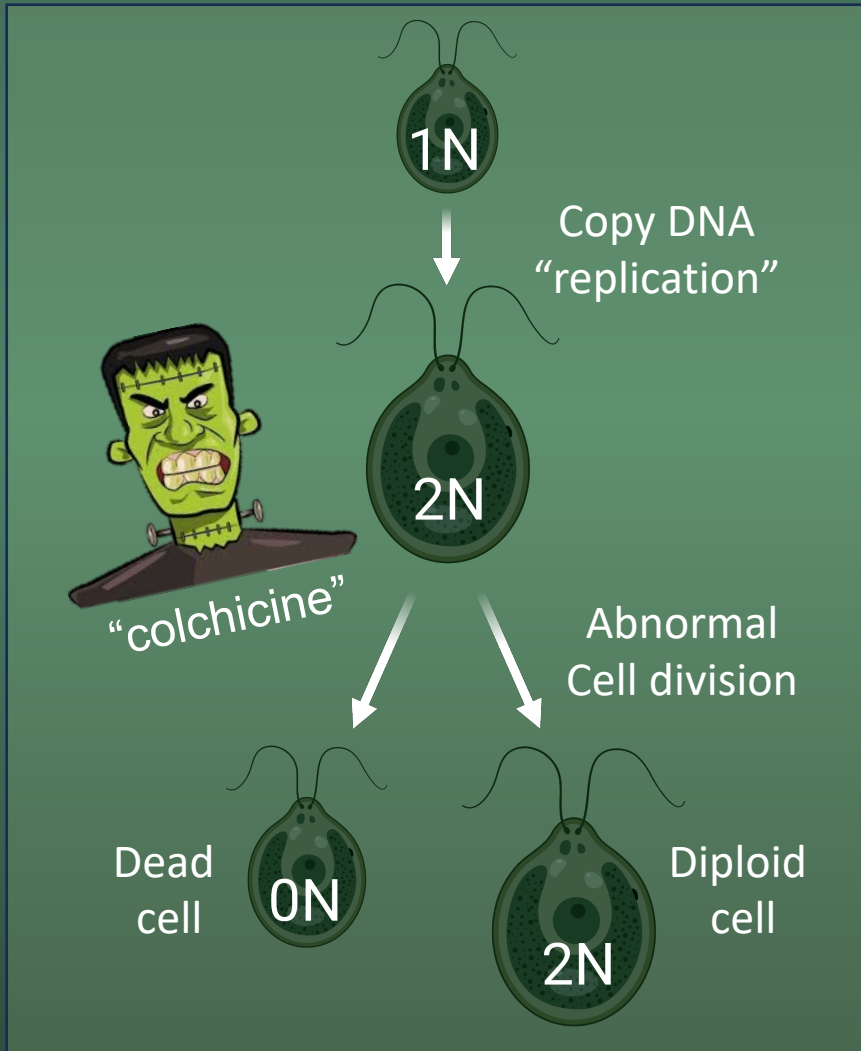
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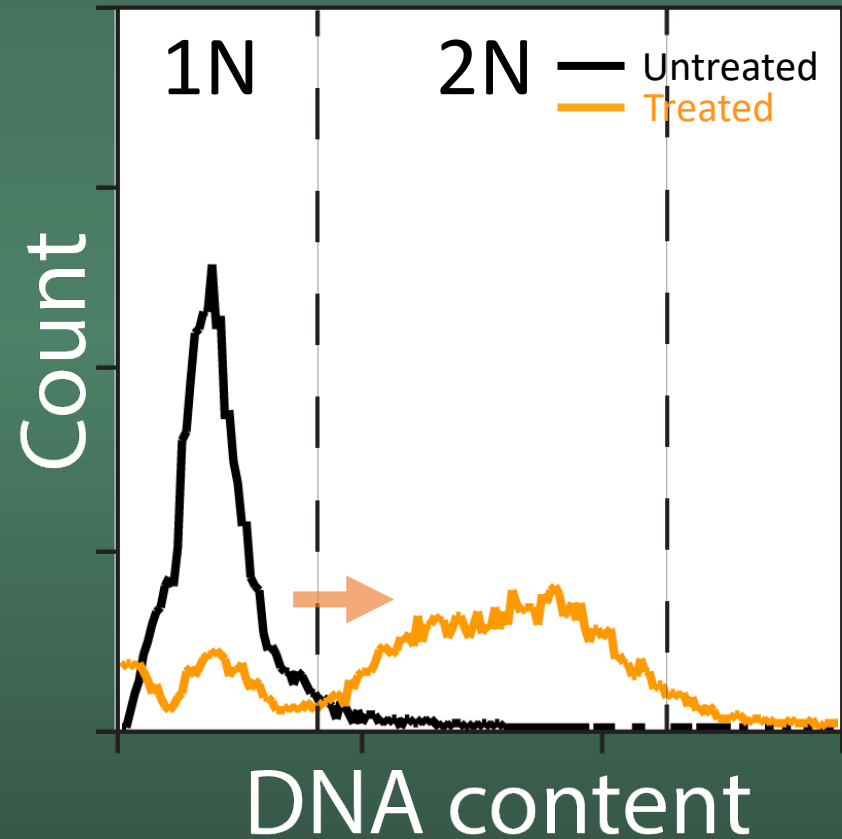
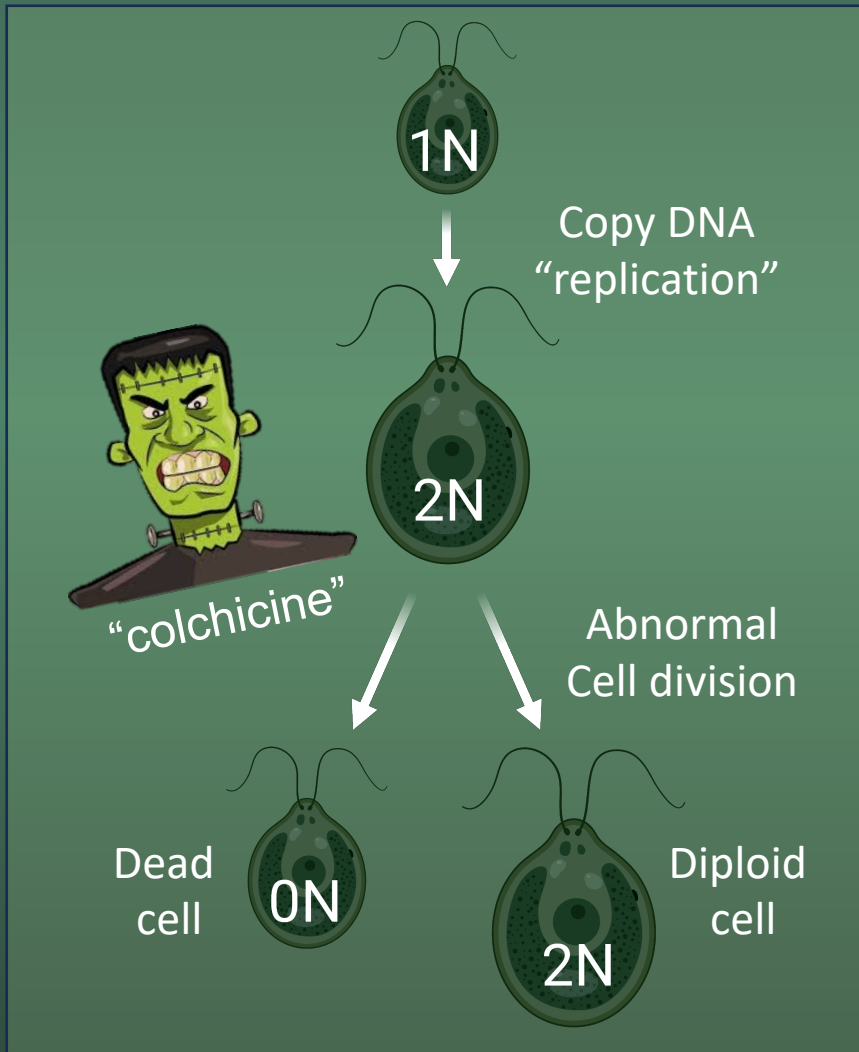
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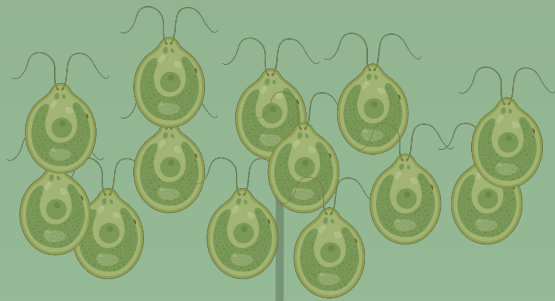


Doubling the genome of algae in the lab

Remember back to biology...
Normal cell division



Diploid algae can make algae ponds stronger and more resilient



Algae grow slow with low yields



Susceptible to stress



Algae grow faster, larger, with high yields



Tolerant to stress



Thank you!



Erik R. Hanschen



Claire Sanders



Omar Holguin

- Claudia Galvan
- Harmanpreet Kaur

