

# RUBISCO

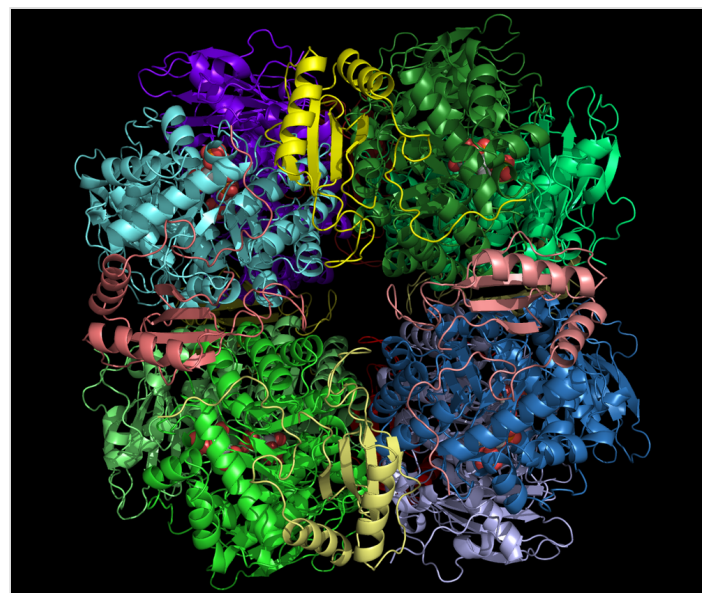
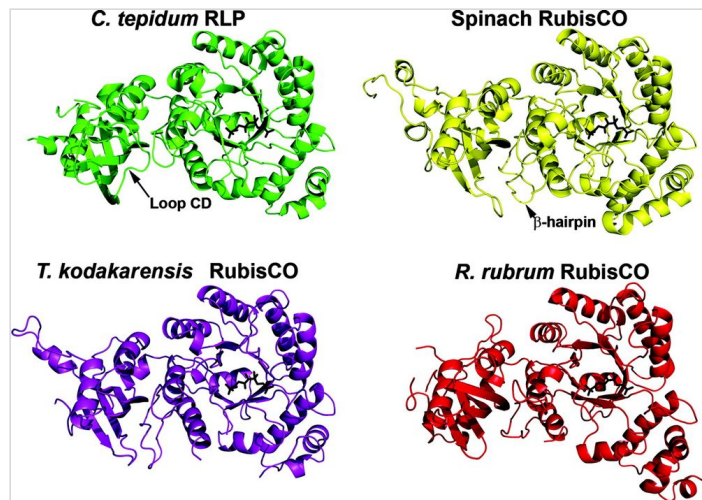
PLANTS ARE COOL

JAMIE DIEP NOV 28, 2017 02:48PM

It is the most abundant enzyme on Earth!!

Jamie, Sophie, Rosa, Claire, Aidan

Period 8



## Ribulose-1,5-bisphosphate carboxylase/oxygenase

or...

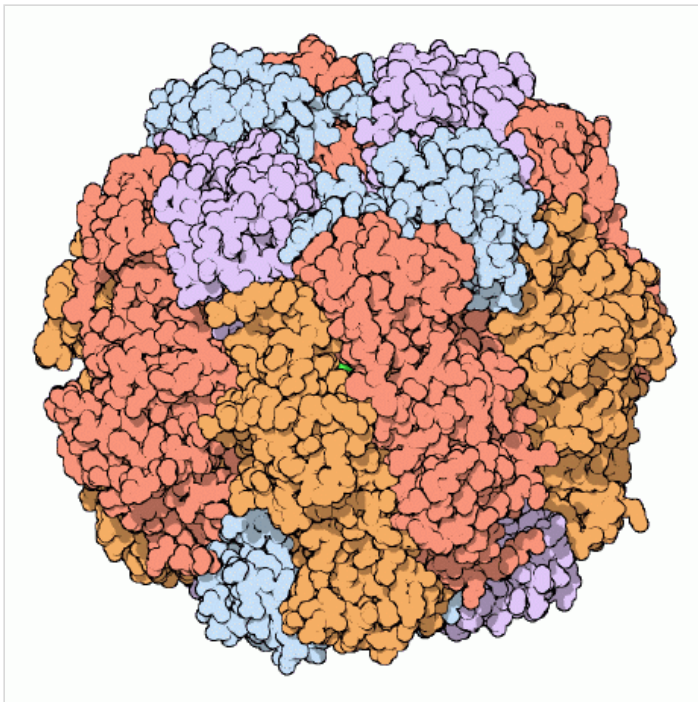
**RUBISCO**

### Why is rubisco important?

Rubisco is known as the most important enzyme. It is the most abundant enzyme in the world and it makes organic products which are used by living organisms for respiration. On top of this, rubisco is the base for all carbon-based life, and it is responsible for the first major step of carbon fixation (the process of CO<sub>2</sub> transitioning into organic compounds), and through this process, the carbon dioxide from the atmosphere is converted by photosynthetic organisms (ie. plants) into energy molecules, (ie. glucose). Without this process, life would be completely different, because with out this abundant source of energy that rubisco provides, there would be little to no plants, at least not what we think of when we think of plants.

### Where is Rubisco Found?

Rubisco is the most abundant enzyme on Earth with 88 billion pounds being made every second! Rubisco is an enzyme found in every single plant inside the chloroplasts! Though it can also be found in some photosynthesizing bacteria, archaea and protists.



ribulose-1,5-bisphosphate (known as RuBP) with carbon dioxide or oxygen."

\*an organic compound characterized by the grouping  $>C(OH)-C(OH)<$  containing 2 hydroxyl groups adjacent to a double bond. a reducing sugar can form an **enediol**.

## Rubisco can improve wheat yields

"Plant scientists at Lancaster University, Rothamsted Research, and The International Maize and Wheat Improvement Center (CIMMYT) have been investigating a naturally occurring plant enzyme known as Rubisco to explore its ability to boost photosynthesis and increase crop yields."

Carl R. Woese Institute for Genomic Biology, University of Illinois at Urbana-Champaign. "Enzymes with potential to increase wheat yields." ScienceDaily. ScienceDaily, 28 January 2016.

[www.sciencedaily.com/releases/2016/01/160128155105.htm](http://www.sciencedaily.com/releases/2016/01/160128155105.htm)  
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## What The Protein Does

Rubisco is very important in biology because it is the beginning of a reaction where inorganic carbon enters the "organic biosphere."

Rubisco is an enzyme in the Calvin Cycle- the part of photosynthesis where  $H_2O$ , light, and  $CO_2$  are converted into glucose and  $O_2$  as a form of energy. Rubisco reacts with ribulose-1, 5-biphosphate to create enediol\*. Carbon fixation cannot be completed without enediol- so rubisco's function is to synthesize to enediol.

"RuBisCO catalyzes either the carboxylation or oxygenation of

### Enzymes with potential to increase wheat yields

Wheat yields could be significantly increased thanks to varieties with a superior form of a common enzyme, according to new research. Models suggest that incorporating the new enzymes into wheat could increase photosynthesis by up to 20% under some field conditions.

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