Starch biosynthesis in developing seeds

What is this research about?

Starch is an important source of food world-wide and is used in many industries. There is increased food demand and desire for specific starches in food and non-food sectors. Scientists and producers can help increase starch yield and improve quality to meet these demands if they understand the synthesis of starch well.

Therefore it is important to understand the assembly of starch granules and the factors that regulate synthesis. This research is about how starch is made in the cells of agricultural plants such as wheat, corn, barley, and rice.

What you need to know:

There are many important uses of starch in food and non-food sectors. Researchers are working to better understand the biosynthesis of starch so that they can increase starch yield and improve starch quality. This review article presents current knowledge about the synthesis pathway, the enzymes involved, and regulation of key enzymes.

How can you use this research?

Producers of starch-storing plants and crops can use this research to gain an understanding of how current science may affect their production work.

Dietitians/nutritionists – starch is the most important dietary source of energy for humans, and represents a major proportion of daily caloric intake. Therefore dietitians may want to stay informed with current scientific progress in manipulation of starch structure and yields.

Government and non-governmental organizations with an interest in the future potential uses of starch can use this research to gain an overview of current knowledge in the field.

What did the researchers do?

The researcher did a review of current research knowledge on storage starch synthesis occurring in amyloplasts. Recent advances in this research field were discussed.

What did the researchers find?

Isolating genetic mutants and genetic engineering allow researcher to learn more about starches. Researchers now know the complete genome sequences of some plants. This gives them more information about the genes involved in starch metabolism. The genomes of different plants that produce starch have been compared and researchers know the forms of enzymes involved in starch synthesis are not the same in all plants.

A mutant gene is a gene that has changed so that the normal trait it expresses or its function is affected. Many studies use mutant genes to try to learn the normal function of a gene. This review found that this research method might be too simple to understand true gene function because genes may express multiple traits or have complex interaction.

In the field of research about starch biosynthesis, more work is needed to discover/better understand:

- Interactions between starch metabolic enzymes in starch-storing crops
- The mechanisms and signalling cues that govern enzyme interaction
- Some signalling pathways
- The exact role of different proteins

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