B·DEBATE International Center for Scientific Debate BARCELONA

CRAG CENTRE DE RECERCA EN AGRIGENÒMICA CSIC IRTA UAB

JAMES J. GIOVANNONI

CV

PARTICIPANT AT:

EVOLUTION OF PLANT PHENOTYPES
FROM GENOMES TO TRAITS

March, 17th-18th, 2015, Barcelona

James J. Giovannoni, Professor, Boyce Thompson Institute for Plant Research and USDA-ARS, Ithaca, USA

James J. Giovannoni got the PhD of Plant Molecular Biology at the University of Berkeley in 1990. He did Post-doctoral research in the Cornell University ending in 1992. Then, he was assistant and associated Professor of the Department of Horticulture in the Texas A&M University. Since 2000 he is Professor of the Boyce Thompson Institute for Plant Research, Research Molecular Biologist and Adjunct Professor of Plant Biology of the Cornell University. The focus of research in their laboratory is molecular and genetic analysis of fruit ripening and related signal transduction systems. They are investigating the regulation of ripening using tomato as model system and exploring the conservation of ripening mechanisms in additional fruit species. The lab deploys a combination of molecular, genetic, genomics and epigenome approaches to understand the regulation of fruit ripening and related shelf-life and nutrient quality characteristics.

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ABSTRACT

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Harnessing the Tomato Genome for Biological Discoveries with Practical Implications Toward Shelf-Life and Fruit Quality

Tomato is a primary model for fruit development and shelf-life in addition to a vegetable crop of increasing production and nutritional importance the world over. Pioneering work undertaken by numerous researchers over the last half century in tomato genetics and biology has elucidated mechanisms of pathogen response, flower and fruit development, ethylene hormone synthesis and perception, and genetic control of fruit ripening. Novel, painstakingly collected, intricately designed, well characterized and freely available germplasm resources, combined with efficient transformation and a high quality genome sequence have accelerated the pace of tomato biology with practical implications to crop improvement. Our work has focused on the characterization of ripening transcription factors underlying fruit ripening mutations with dramatic effects on ripening and nutrient quality. Additional regulators have been uncovered via examination of genes associated with ripening based on expression profiles. Others have identified additional transcriptional regulators that add greatly to our understanding of ripening control. Genome enabled analysis of fruit development further indicates that transcriptional control intersects with changes in the epigenome. An overview of the genetic regulators of fruit ripening in tomato will be presented, with examples of practical value provided in addition to instances of leveraging tomato discoveries toward insights pertaining to the ripening and shelf-life of other fruit crops.

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