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2008 : November 2008 - New Hot Papers : Patrick Wincker

## NEW HOT PAPERS - 2008

November 2008



Patrick Wincker talks with *ScienceWatch.com* and answers a few questions about this month's New Hot Paper in the field of Plant & Animal Science.



**Article Title:** The grapevine genome sequence suggests ancestral hexaploidization in major angiosperm phyla

**Authors:** Jaillon, O, et al.

**Journal:** NATURE

**Volume:** 449

**Issue:** 7161

**Page:** 463-U5

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(addresses have been truncated)

### SW: Why do you think your paper is highly cited?

This paper provides a reference genome sequence for the grapevine. It gives direct access to the genes of this highly valuable crop, and as such is of importance for researchers dealing with molecular aspects of grape cultivation and wine making. A second contributing factor is that this genome sequence highlights general aspects of flowering plant evolution, changing the way genome duplication history is seen in this group.

### SW: Does it describe a new discovery, methodology, or synthesis of knowledge?

It describes new discoveries. The main finding is the global structure of the grape genome; other points are related to the description of genes of interest in aromatic properties, and how this genome reveals evolutionary changes in the angiosperms (flowering plants).

### SW: Would you summarize the significance of your paper in layman's terms?

The current challenges to grapevine culture are mostly related to the existence of pathogens for which natural resistance is not widespread, and to the excessive use of chemicals for fighting these pathogens and improving yields. The genome sequence, presented for the first time in this paper, will help in rationalizing the fight against diseases, for example by the introduction of resistance genes.

It will also provide a global framework for understanding how the gene content of a particular grape variety impacts the aromatic properties of the wine it produces. Finally, this paper has a more fundamental impact, as it reveals that the evolution of flowering plants was marked by a global genome arrangement that gave rise to many of today's species.

### SW: How did you become involved in this research, and were there any problems along the way?

This project was launched by the French and Italian ministries of agriculture. Genome laboratories in both countries combined their efforts towards the completion of a high-quality genome sequence. The main difficulty was in the choice of the cultivar to be sequenced, as the economic importance of each cultivar varies in different countries. The final resolution was to use a highly inbred line that can be used as a reference for all other cultivated isolates. This explains the high fidelity of the sequence, a result that could not have been obtained with most commercial isolates that are highly heterozygous.

*"This project was launched by the French and Italian ministries of agriculture."*

**SW: Where do you see your research leading in the future?**

The grapevine genome will be used by two groups of researchers. First, those interested in grapevine improvement are currently testing approaches to select new disease resistance loci, and to provide a rationale for the aromatic properties of wine. Second, those interested in angiosperm evolution are using the discoveries of this paper to reassess the relationships between genome duplications and speciation in this important group of species.

**SW: Do you foresee any social or political implications for your research?**

As with other major plants which have had their genome sequenced, this work will lead to rational use of genetic information for crop improvement, a subject of intense debate.

**Patrick Wincker, Ph.D.**

**Department Head**

**Genome Sequencing**

**Genoscope**

**Evry, France**

[Web](#)

Keywords: grapevine genome sequence, molecular aspects of grape cultivation and wine making, grape genome, flowering plant evolution, genome duplication history, genome reveals evolutionary changes in the angiosperms, grapevine culture.



[back to top](#) 

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