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*Editors:* Charles L. Cantrell, Daniel Cook, Franck E. Dayan and Daneel Ferreira

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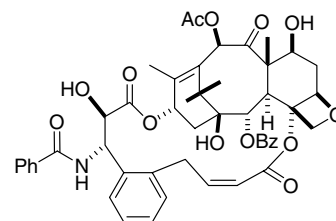
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The shape of things to come: Structural and synthetic studies of taxol and related compounds

pp 1844–1854

David G.I. Kingston\*

The history of the development of Taxol® (paclitaxel) as an anticancer drug is reviewed, aspects of the phytochemistry of *Taxus* species, of the medicinal chemistry of taxol, and of the taxol–tubulin interaction are discussed, with 58 references.



Steviol glycoside biosynthesis

pp 1855–1863

J.E. Brandle\*, P.G. Telmer

Steviol glycosides are found in high concentrations in the leaves of the Paraguayan perennial herb *Stevia rebaudiana*, their intense sweetness and high concentration in *Stevia* leaf tissue has made them the subject of research interest for over 100 years. The convergence of genomics and plant biochemistry has led to the rapid elucidation of the genes coding for the various enzymes in the biosynthetic pathway.

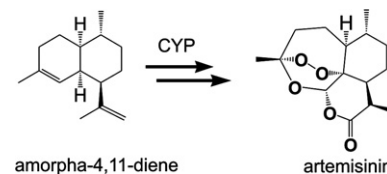


## Functional genomics and the biosynthesis of artemisinin

pp 1864–1871

Patrick S. Covello<sup>\*</sup>, Keat H. Teoh, Devin R. Polichuk,  
Darwin W. Reed, Goska Nowak

The biosynthesis in *Artemisia annua* glandular trichomes of the antimalarial sesquiterpene artemisinin is reviewed with emphasis on recent functional genomics studies in the authors' laboratory.

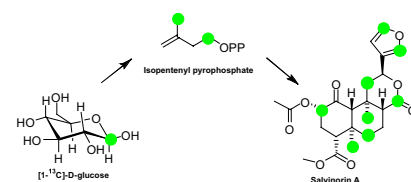


## Biosynthesis of salvinorin A proceeds via the deoxyxylulose phosphate pathway

pp 1872–1881

Lukasz Kutrzeba, Franck E. Dayan, J'Lynn Howell, Ju Feng,  
José-Luis Giner, Jordan K. Zjawiony<sup>\*</sup>

Biosynthetic analysis of diterpene salvinorin A proved its formation via the DOXP pathway. *Salvia divinorum* was administered [1-<sup>13</sup>C]-D-glucose in sterile culture of microshoots. Results were analyzed by LCMS and NMR spectroscopic techniques.

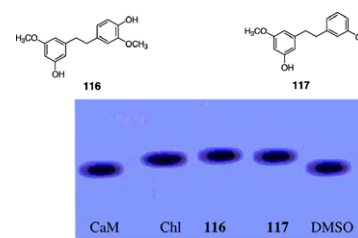


## Natural products with calmodulin inhibitor properties

pp 1882–1903

Sergio Martínez-Luis, Araceli Pérez-Vásquez, Rachel Mata<sup>\*</sup>

This review summarizes properties of various naturally occurring compounds with reported calmodulin inhibitory properties, which include about 159 natural products belonging to different structural classes. Most inhibitors are alkaloid and peptide type of compounds and have been isolated from a wide variety of natural sources.



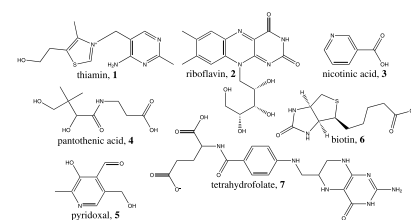
SDS-PAGE of bovine-brain CaM treated with **116** and **117** in the presence of Ca<sup>2+</sup>

## Vitamin B biosynthesis in plants

pp 1904–1921

Sanja Roje<sup>\*</sup>

The B vitamins, water-soluble cofactors and their derivatives, are essential nutrients in the human diet.

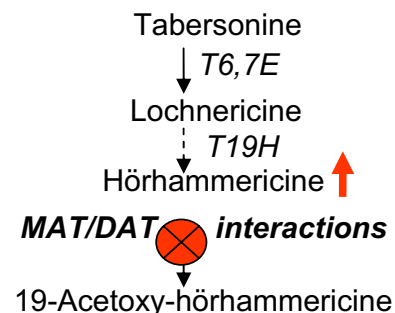


**Expression of deacetylindoline-4-*O*-acetyltransferase in *Catharanthus roseus* hairy roots**

pp 1922–1931

Mary Magnotta, Jun Murata, Jianxin Chen, Vincenzo De Luca\*

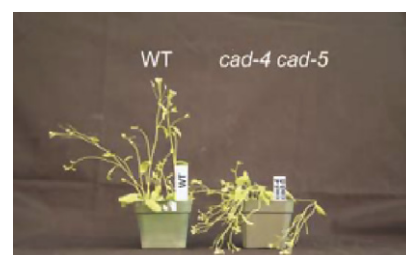
DAT expressing *Catharanthus roseus* hairy roots accumulated 3-fold higher levels of Hörhammericine than control roots. Inhibition of MAT activity by DAT provides a plausible explanation for the results obtained.

**Plant cell walls are enfeebled when attempting to preserve native lignin configuration with poly-*p*-hydroxycinnamaldehydes: Evolutionary implications**

pp 1932–1956

Michaël Jourdes, Claudia L. Cardenas, Dhrubojyoti D. Laskar, Syed G.A. Moinuddin, Laurence B. Davin, Norman G. Lewis\*

The effects of disruption of lignin macromolecular configuration and stem vascular integrity through CAD mutations are described. Template polymerization was attempted but aborted at an early stage of cell-wall phenolic deposition when *p*-hydroxycinnamaldehydes were employed as substrates.

**Expression of cinnamyl alcohol dehydrogenases and their putative homologues during *Arabidopsis thaliana* growth and development: Lessons for database annotations?**

pp 1957–1974

Sung-Jin Kim, Kye-Won Kim, Man-Ho Cho, Vincent R. Franceschi, Laurence B. Davin, Norman G. Lewis\*

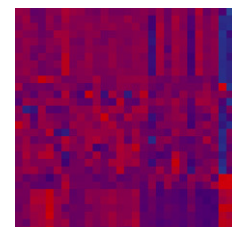
Comprehensive examination of expression data for the putative nine-membered cinnamyl alcohol dehydrogenase gene family in *Arabidopsis* is described: AtCAD4 (At3g19450), AtCAD5 (At4g34230), AtCAD7 (At4g37980) and AtCAD8 (At4g37990) had patterns consistent with a role in lignification, whereas AtCAD2 (At2g21730) and AtCAD3 (At2g21890) did not. AtCAD1 (At1g72680), AtCAD6 (At4g37970) and AtCAD9 (At4g39330) were also expressed in lignifying tissues, but their biochemical functions remain unknown. The recent annotation of some of these genes as probable mannitol dehydrogenases (i.e. AtCAD2, 3 and 6–9) should be discontinued at this point.

**Dirigent proteins in conifer defense II: Extended gene discovery, phylogeny, and constitutive and stress-induced gene expression in spruce (*Picea* spp.)**

pp 1975–1991

Steven G. Ralph, Sharon Jancsik, Jörg Bohlmann\*

Meta-analysis of spruce microarray profiles reveals patterns of stress-induced and constitutive transcript expression across the dirigent protein family.

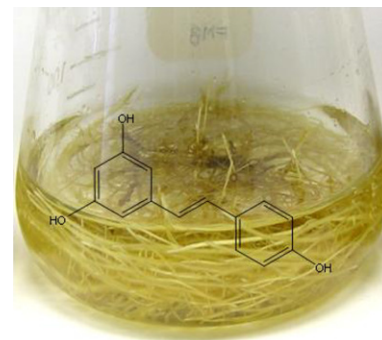


## Production and secretion of resveratrol in hairy root cultures of peanut

pp 1992–2003

Fabricio Medina-Bolivar\*, Jose Condori, Agnes M. Rimando, John Hubstenberger, Kristen Shelton, Sean F. O’Keefe, Selester Bennett, Maureen C. Dolan

Hairy root cultures of peanut were established and elicited to produce *trans*-resveratrol. Sodium acetate increased the levels of *trans*-resveratrol in the medium by almost 60-fold in comparison to non-elicited cultures.

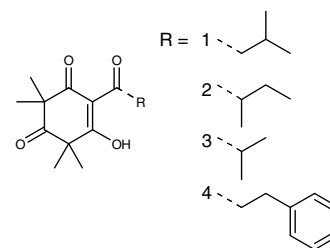


## *p*-Hydroxyphenylpyruvate dioxygenase is a herbicidal target site for $\beta$ -triketones from *Leptospermum scoparium*

pp 2004–2014

Franck E. Dayan\*, Stephen O. Duke, Audrey Sauldubois, Nidhi Singh, Christopher McCurdy, Charles Cantrell

*p*-Hydroxyphenylpyruvate dioxygenase (HPPD) is a key enzyme in the biosynthesis of prenyl quinones and tocopherol, and is the target site of  $\beta$ -triketone herbicides. Manuka oil and its  $\beta$ -triketone components were tested for their herbicidal activity and their potency against HPPD.

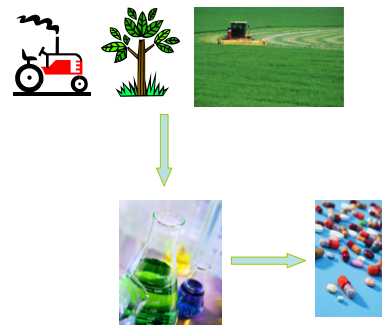


## Plant natural products: Back to the future or into extinction?

pp 2015–2022

James D. McChesney\*, Sylesh K. Venkataraman, John T. Henri

Can or will plant derived natural products ever again be the foundation for new drug discovery and development? A scenario is proposed where natural products are not only the venue of discovery but also the economical and practical source of active pharmaceutical ingredients. “Where there’s a will, there’s a way”.



## OTHER CONTENTS

### Erratum

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### The Phytochemical Society of North America

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