

# BOOK OF ABSTRACTS

## 3rd International Conference on Plant Biology (22nd SPSS Meeting)



9-12 JUNE 2018  
BELGRADE



**Serbian Plant Physiology Society**

**Institute for Biological Research "Siniša Stanković", University of Belgrade**

**Faculty of Biology, University of Belgrade**

**3<sup>rd</sup> International Conference  
on Plant Biology  
(22<sup>nd</sup> SPPS Meeting)**



9-12 June 2018, Belgrade

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## Anticancer properties of the abietane diterpene 6,7-dehydroroyleanone from *Plectranthus madagascariensis*

PP5-18

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Natural compound-based green chemistry has been the focus of current nanobiotechnology research to improve efficacy and safety of medicines through targeted drug delivery. The *Lamiaceae* family, widely used in traditional medicine, is a well-known source of natural compounds with anticancer properties. A wide spectrum of bioactive diterpenes have been isolated from the genus *Plectranthus*, including 6,7-dehydroroyleanone (DHR), a abietane found in the essential oil of *P. madagascariensis*. The biological activity of DHR was investigated in P-glycoprotein-overexpressing multidrug resistant (MDR) non-small cell lung cancer cell line (NCI-H460/R), its sensitive counterpart (NCI-H460) and normal human embryonic bronchial epithelial cells (MRC-5). DHR showed significant growth inhibition and slight selectivity against cancer cell lines when compared to normal cells. The results also confirmed that DHR is not a substrate for P-glycoprotein as it does not interfere with its activity. This diterpene was incorporated into Hybrid nanoparticles in order to increase treatment efficacy and delivery selectivity. Anticancer properties of this nanosystem were compared to the activity of DHR alone. Additionally, to address the problem of multidrug resistance, this nanosystem was tested against cancer cells with MDR phenotype. Coupling of DHR with Hybrid nanoparticles additionally improved the cytotoxicity of DHR, decreasing the IC<sub>50</sub> value 8-fold in NCI-H460 cells and 5-fold in NCI-H460/R cells. These findings imply that combining natural products, such as DHR, with nanoparticles could be considered as a promising anticancer strategy with potential to overcome drug resistance.

**Keywords:** *Plectranthus*, 6,7-dehydroroyleanone, cytotoxicity, multidrug resistance, nanotechnology