



Society of Physical Chemists of Serbia

PHYSICAL CHEMISTRY 2021

*15th International Conference on
Fundamental and Applied Aspects of
Physical Chemistry*

PC2021

The Conference is dedicated to the

30th Anniversary of the founding of the Society of Physical Chemists of Serbia

and

100th Anniversary of Bray-Liebhafsky reaction



PHYSICAL CHEMISTRY 2021

15th International Conference on Fundamental and Applied Aspects of Physical Chemistry

Organized by

The Society of Physical Chemists of Serbia (SPCS)



in co-operation with

Institute of Catalysis, Bulgarian Academy of Sciences



Boreskov Institute of Catalysis, Siberian Branch of Russian Academy of Sciences



and

Members of the University of Belgrade:



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H-12-P**INHIBITION OF ECTO-NUCLEOSIDE TRIPHOSPHATE
DIPHOSPHOHYDROLASES BY POLYOXOPALLADATES WITH
PROMISING ANTILEUKEMIC PROPERTIES**M. B. Čolović¹, T. Ma², X. Ma², A. Isaković³, S. Misirlić-Denčić³, U. Kortz² and D. Z. Krstić⁴¹*Department of Physical Chemistry, "Vinča" Institute of Nuclear Sciences-National Institute of the Republic of Serbia, University of Belgrade, Serbia (colovicm@vin.bg.ac.rs)*²*Department of Life Sciences and Chemistry, Jacobs University, Bremen, Germany*³*Institute of Medical and Clinical Biochemistry, Faculty of Medicine, University of Belgrade, Serbia*⁴*Institute of Medical Chemistry, Faculty of Medicine, University of Belgrade, Serbia*

Polyoxopalladates(II) (POPs) are the largest subset of polyoxo-noble-metalates (PONMs), representing a class of discrete, anionic noble metal-oxo nanoclusters. In this study, the *in vitro* effects of two isostructural, fully inorganic POP salts containing tetravalent metal ions (Sn^{IV} and Pb^{IV}) incorporated inside the cubic Pd₁₂-oxo host-shell, Na₁₂[Sn^{IV}O₈Pd₁₂(PO₄)₈]·43H₂O (**SnPd₁₂**) and Na₁₂[Pb^{IV}O₈Pd₁₂(PO₄)₈]·38H₂O (**PbPd₁₂**), which were found to exhibit considerable antileukemic effects, on E-NTPDase activity were investigated using rat synaptic plasma membranes (SPMs) as a model system. Concentration-dependent inhibition of E-NTPDases was observed within the concentration range 5×10^{-6} - 2×10^{-4} mol/L for both POPs. Inhibition parameters, half-maximum inhibitory concentrations (IC₅₀ values) and Hill's coefficients, n_H, were determined by sigmoidal fitting the experimental results and Hill's analysis. The calculated IC₅₀ values were $(6.59 \pm 1.09) \times 10^{-5}$ and $(9.88 \pm 3.83) \times 10^{-5}$ mol/L for **SnPd₁₂** and **PbPd₁₂**, respectively. The calculated n_H values were < 1, indicating negatively cooperative enzyme-inhibitor binding for both POPs. Accordingly, the confirmed antileukemic activities of **SnPd₁₂** and **PbPd₁₂** could be associated with the observed inhibition of E-NTPDases as a potential target of the antileukemic action of these promising drug candidates.

H-13-P**CYTOGENOTOXICITY ASSESSMENT OF POLYOXOPALLADATES(II) AS
PROMISING ANTILEUKEMIC DRUG CANDIDATES**M. B. Čolović¹, G. Gajski², M. Gerić², T. Ma³, X. Ma³, U. Kortz³ and D. Z. Krstić⁴¹*Department of Physical Chemistry, "Vinča" Institute of Nuclear Sciences-National Institute of the Republic of Serbia, University of Belgrade, Serbia (colovicm@vin.bg.ac.rs)*²*Institute for Medical Research and Occupational Health, Zagreb, Croatia*³*Department of Life Sciences and Chemistry, Jacobs University, Bremen, Germany*⁴*Institute of Medical Chemistry, Faculty of Medicine, University of Belgrade, Serbia*

Polyoxopalladates(II) (POPs) are discrete, anionic palladium(II)-oxo nanoclusters that possess features of both conventional polyoxometalates (POMs) and palladium(II), which were shown to exhibit promising antitumor properties. In this study, *in vitro* cyto- and genotoxicity evaluation was