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Crystal structure, spectroscopy, DFT studies and thermal characterization of cobalt(II) complex with 2-protonated aminopyridinium cation as ligand

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Single crystals of a new organic-inorganic hybrid compound (2-HAMP)₂[CoBr₄], (2-HAMP=2-protonated aminopyridinium cation) was synthesized and characterized by X-Ray diffraction at room temperature, DTA-TG measurement, FT-IR and FT-Raman spectroscopy and optical absorption. Its crystal structure is a packing of alternated organic and inorganic layers parallel to (A and B) plane. The different components are connected by a network of N/C-H...Br hydrogen bonds and halogen...halogen interactions. These hydrogen bonds give notable vibrational effects. Theoretical calculations were performed using density functional theory (DFT) for studying the molecular structure, vibrational spectra and optical properties of the investigated molecule in the ground state. The optimized geometrical parameters obtained by DFT calculations are in good agreement with single crystal XRD data. The energy and oscillator strength calculated by time-dependent density functional theory (TD-DFT) results complements with the experimental findings. The simulated spectra satisfactorily coincide with the experimental UV-Visible spectrum. The results show good consistent with the experiment and confirm the contribution of metal orbital to the HOMO-LUMO boundary. Thermal analysis studies indicate the presence of three phase transitions at 68, 125 and 172 °C, which are confirmed by X-ray powder diffraction as a function of temperature.

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Fascin and versican in acute leukemia: Clinical significance and clinicopathologic correlation

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Background: Fascin and Versican are involved in proliferation, migration and invasion of cancer cells. In spite of this pivotal role of both Fascin and Versican in many types of human malignancies, little is known about their role in acute leukemia.

Objective: To measure plasma and leukocytes concentrations of Fascin and Versican in patients with acute leukemia, and to correlate the results with clinical features and treatment outcome.

Method: Twenty-four patients with acute myeloid leukemia (AML), sixteen patients with acute lymphoblastic leukemia (ALL) and fifteen control subjects were included in the current study. Fascin and Versican were measured in plasma and leukocytes of all subjects by enzyme-linked immunosorbent assay kits provided by MyBioSource Inc., (San Diego, CA, USA).

Results: Plasma Fascin significantly increased in AML, but not ALL cases. Plasma and leukocytes Versican significantly increased in AML compared to both control and ALL cases. Plasma Versican correlated with poor response to induction chemotherapy in AML cases.

Conclusion: All together, Versican may be used as a diagnostic biomarker for AML. The plasma level of Versican could be a novel predictive marker of the response to induction chemotherapy in AML. In addition, plasma Fascin is a potential biomarker for AML.

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