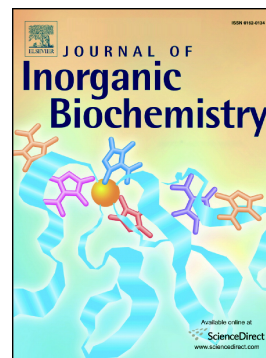


Accepted Manuscript

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PII: S0162-0134(17)30326-4
DOI: doi:[10.1016/j.jinorgbio.2017.11.007](https://doi.org/10.1016/j.jinorgbio.2017.11.007)
Reference: JIB 10367
To appear in: *Journal of Inorganic Biochemistry*
Received date: 6 May 2017
Revised date: 3 November 2017
Accepted date: 4 November 2017

Please cite this article as: Mingchang Zhu, Tingting Peng, Na Sun, Xue Qiu, Yang Zhan, Yuqing Ding, Shaozhong Zhang, Enjun Gao , A series of novel complexes firstly constructed by 1,4-Pheny lenedioxydiacetic acid plays a role in disruption of DNA gene expression and induction of apoptosis. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Jib(2017), doi:[10.1016/j.jinorgbio.2017.11.007](https://doi.org/10.1016/j.jinorgbio.2017.11.007)

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A series of novel complexes firstly constructed by 1,4-Phenylenedioxydiacetic acid plays a role in disruption of DNA gene expression and induction of apoptosis

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A set of five metal–organic frameworks, namely, $[\text{Cd}_2(\text{L})_2\text{BIP}(\text{H}_2\text{O})_2 \cdot 6\text{H}_2\text{O}]_n$ (**1**), $[\text{Ce}(\text{L})_{1.5}(\text{H}_2\text{O})_2 \cdot \text{H}_2\text{O}]_n$ (**2**), $[\text{Sm}(\text{L})_{1.5}(\text{H}_2\text{O})_2 \cdot 3\text{H}_2\text{O}]_n$ (**3**), $[\text{Gd}(\text{L})_{1.5}(\text{H}_2\text{O})_2 \cdot 3\text{H}_2\text{O}]_n$ (**4**), $[\text{Ho}(\text{L})_{1.5}(\text{H}_2\text{O})_2 \cdot 3\text{H}_2\text{O}]_n$ (**5**), have been prepared under hydrothermal conditions (1,4-H₂L=1,4-Phenylenedioxydiacetic acid; 1,4-BIP=1,4-bis(2-pyridylmethyl)piperazine; C₂H₅OH=EtOH). The long BIP ligand (N···N separation of ca. 8.355 Å) induces interpenetration of **1** to increase both the framework stability and the density of effective catalytic metal centers. Characterization of all complexes has been carried out by means of IR spectroscopy, single crystal and powdered sample X-ray diffraction (PXRD) through conventional and synchrotron radiation, Thermogravimetric (TG), fluorescent measurement (liquid and solid), DNA molecular docking, cancer cell apoptosis morphology through fluorescent inverted microscope, IC₅₀, which the cytotoxic activity of the complexes was tested against two different cancer and one normal cell lines. The results indicate that all the complexes are potential fluorescent light-emitting materials and the four (**2**, **3**, **4**, **5**) complexes present remarkable anti-cancer effect.

KEYWORDS

DNA binding, Apoptotic, crystal structure, molecular docking

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