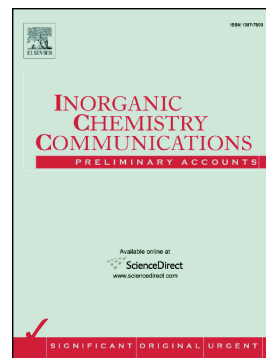


## Accepted Manuscript

Three mononuclear Cu (II) complexes based on p-tolylmethanamine Schiff bases: In-vitro cytotoxicity, DNA binding ability, nuclease activity and antibacterial studies

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**Three mononuclear Cu (II) complexes based on p-tolylmethanamine Schiff bases: In-vitro cytotoxicity, DNA binding ability, Nuclease activity and antibacterial studies****D. Shiva Shankar, Aveli Rambabu, Narendrula Vamsikrishna, Nirmala Ganji, Sreenu Daravath, Shivaraj\****Department of Chemistry, Osmania University, Hyderabad, Telangana-500007, India*

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**Abstract**

Herein, we have reported three novel mononuclear copper (II) complexes **1**. [Cu(L<sup>1</sup>)<sub>2</sub>], **2**. [Cu(L<sup>2</sup>)<sub>2</sub>] and **3** [Cu(L<sup>3</sup>)<sub>2</sub>] where, L<sup>1</sup>H = (2-(4-methylbenzylimino)methyl)-4-nitrophenol, C<sub>15</sub>H<sub>14</sub>N<sub>2</sub>O<sub>3</sub>), L<sup>2</sup>H = (2-(4-methylbenzylimino)methyl)-4-chlorophenol, C<sub>15</sub>H<sub>14</sub>ClNO) and L<sup>3</sup>H = (2-(4-methylbenzylimino)methyl)-4,6-dichlorophenol, C<sub>15</sub>H<sub>13</sub>Cl<sub>2</sub>NO) have been characterized by several physicochemical techniques. Having a base of spectroscopic and analytical data, complexes **1**, **2** and **3** exhibited square planar geometry where Schiff bases acts as a bi-dentate NO donar ligands. DNA biding and nuclease activity studies against CT-DNA and supercoiled pBR322-DNA respectively revealed an intercalative mode of binding and also cleave efficient manner. Moreover, synthesized compounds was investigated for their *in-vitro* cytotoxic potential against human breast cancer cell (MCF-7) and oral cancer cell (KB3) using cis-platin as standard drug under MTT assay, results revealed that the biological potency of synthesized compounds as well as antibacterial activity.

**Keywords:** Mononuclear Copper (II) complex; Cytotoxicity; DNA interaction; Antibacterial activity.

**1. Introduction**

Cancer is a major national burden, it has an impact on social functioning and serves as a primary target in the field of medicinal chemistry [1,2]. Nowadays, cis-platin is one of the mostly used compounds for the treatment of several human solid carcinomas, namely testicular and ovarian carcinoma [3]. The clinical use of cis-platin (approved by the Rosenberg in 1978) for the treatment of variety of cancers, caused patients suffer from unwanted side effects such as gastrointestinal and hematological toxicity [4,5]. Meanwhile, it has stimulated that an extensive search for non-platinum antitumor-active inorganic complexes with improved pharmacological properties. Therefore, an emergent research on novel compounds with higher active and lower toxicity is necessary [6-9]. Among many of the bio-essential metals, copper complexes are considered as promising alternatives to well known platinum anticancer drugs [10,11] such as Cisplatin, Carboplatin, Oxaliplatin, Spiroplatin and Hiproplatin. According to Palaniandavar et al [12], copper plays several roles in human physiology, including the development of connective

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