



## Preparation and Characterization of Novel Schiff Base Derived From 4-Nitro Benzaldehyde and Its Cytotoxic Activities

Rana Hassan Abdul Majeed<sup>1</sup>, Hanaa Ali Hussein<sup>1\*</sup>, Mohd Azmuddin Abdullah<sup>2</sup>

1. College of Dentistry, University of Basrah, Basrah, Iraq.

2. SIBCo Medical and Pharmaceuticals Sdn. Bhd., No. 2, Level 5, Jalan Tengku Ampuan Zabedah, D9/D, Seksyen 9, 40000 Shah Alam, Selangor, Malaysia.

**Article type:** ABSTRACT

**Original Article**

Normal drugs exhibit activities against both normal and cancer cells. Furthermore, cancer cells may develop resistance to these drugs that alternative treatment must be explored. The main objective of this study was to examine the anticancer activity of Schiff base against Tongue Squamous Cell Carcinoma Fibroblasts (TSCCF) and normal human gingival fibroblasts (NHGF) and to propose its mechanism. A Novel Schiff base ligand was synthesized from the reaction of 5-C-2-4-NABA (5-chloro-2-((4-nitrobenzylidene) amino) benzoic acid). These Schiff bases possessed azomethine group (-HC=N-) and aromatic group (CH) as analyzed by Fourier transforms infrared (FTIR) spectroscopy and UV-Vis spectra. The *in vitro* cytotoxicity screening assay suggested promising activity against TSCCF with IC<sub>50</sub> of 446.68 µg/mL, but insignificant activity against NHGF cells (IC<sub>50</sub> of 977.24 µg/mL) after 72 h. The evidence of apoptotic induction was supported by DAPI staining of apoptotic nuclei with reduced cell numbers, suggesting that Schiff base could induce apoptotic bodies in cancer cells being observed. Based on the Schiff base structure, the anti-cancer mechanism may be attributed to the -HC=N-azomethine group. For the first time, our findings highlighted the anticancer activities of the new Schiff base against oral cancer cell lines.

**Received:**

2023.02.19

**Revised:**

2023.07.28

**Accepted:**

2023.08.05

**Keywords:** Apoptosis, Azomethine group, cytotoxicity, 5-chloro-2-((4-nitrobenzylidene) amino) benzoic acid, oral cancer, Schiff base

**Cite this article:** Abdul Majeed R. Preparation and Characterization of Novel Schiff Base Derived From 4-Nitro Benzaldehyde and Its Cytotoxic Activities. *International Journal of Molecular and Cellular Medicine*. 2022; 11(4):1-12.

**\*Corresponding Author:** Hanaa Ali Hussein

**Address:** Basic Science branch, College of Dentistry, University of Basrah, Basrah, 61004, Basrah, Iraq.

**E-mail:** hanaa.hussein@uobasrah.edu.iq



© The Author(s).

Publisher: Babol University of Medical Sciences

This work is published as an open access article distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by-nc/4>). Non-commercial uses of the work are permitted, provided the original work is properly cited.