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SYNTHESIS OF BENZIMIDAZOLE DERIVATIVES AND PROSPECTION OF THEIR ANTITUMOR ACTIVITY

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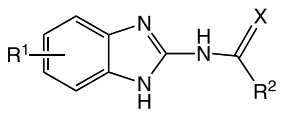
INTRODUCTION

The benzimidazole moiety (Bz) and its derivatives have been known for more than a century (Shrivastava et al. 2017, Arch Pharm). They play an important role in medicinal chemistry and shown extensively potential applications as drugs. Bz derivatives are associated with anticancer (Yadav et al. 2016, Agents Med Chem), antibacterial (Rao et al. 2018, Mini Rev Med Chem.), antifungal (Ates-Alagoz, 2016, Curr Top Med Chem.), antiparasitic (Keri et al., 2015, Chem Biol Drug Des.), or antimycobacterial (Keri et al., 2016, Pharmacol Rep.) activities, among others. In this work, we have synthesized some 2-aminobenzimidazoles that have been tested against two cancer cell lines.

MATERIAL AND METHODS

The 2-aminobenzimidazole derivatives were obtained by reaction of substituted 1,2-phenylenediamines with cyanogen bromide, then the free amino group was reacted either with aldehydes, followed by reduction with $NaBH_4$ in presence of methanol, to give a series of *N*-arylalkyl derivatives, or with acid chlorides to give an amide series .



R^1 = H, CH_3, OCH_3, Cl, NO_2, NH_2

X = O; H,H

R^2 = Phe, Bn, Naphthyl, Furyl

Fig 1. General structure of 2-aminobenzimidazoles

RESULTS

Thirty two 2-aminobenzimidazole derivatives were tested against HeLa and MDAMB231 cell lines at different concentrations. Compounds of type I (*N*-arylalkyl derivatives), showed IC_{50} values around 5 μM; while the amides (type II) displayed values of 25 μM. In general, most potent compounds contain a large substituent attached to the amino group.

CONCLUSIONS

Thirty two *N*-arylalkyl (type I) or *N*-acyl (type II) 2-aminobenzimidazoles, were synthesized and tested against HeLa and MDAMB231 cells lines. Most potent compounds showed IC_{50} values of 5 μM.

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