One-Pot CuO-Catalyzed Green Synthesis of *N*(*N*′)-Arylbenzamidines as Potential Enzyme Inhibitors

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Abstract—Ten *N*(*N*′)-arylbenzamidines were synthesized in 60–77% yield by one-pot microwave-assisted reaction of the corresponding *N*-arylbenzamides with aniline or ammonia in the presence of copper(II) oxide powder. The synthesized compounds were evaluated *in vitro* for inhibitory activity against several enzymes, namely acetylcholinesterase, butyrylcholinesterase, lipoxygenase, α-glucosidase, urease, and reverse transcriptase. Some compounds showed very good acetylcholinesterase and butyrylcholinesterase inhibitory activity. *N*′-(1,3-Benzothiazol-2-yl)- and *N*′-(1,3,4-thiadiazol-2-yl)benzamidines were the most active α-glucosidase inhibitors with IC_{50} values of 134.2 and 244.57 μM, respectively. *N*′-(1,3-Benzothiazol-2-yl)benzamidine also inhibited urease. Most of the obtained compounds showed inhibitory activity against reverse transcriptase (anti-HIV activity), presumably due to intermolecular hydrogen bonding, good solubility, and hydrophilicity.

Keywords: *N*-substituted benzamidines, acetylcholinesterase, lipoxygenase, α-glucosidase, reverse transcriptase.

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