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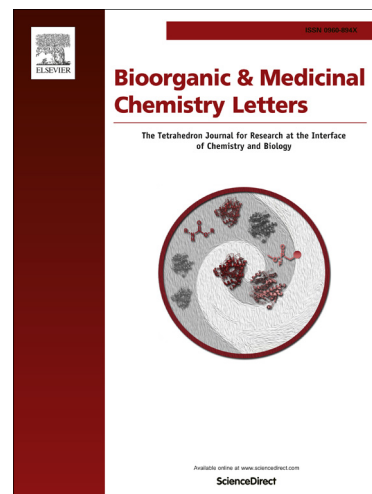
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Synthesis of novel 4-nitropyrrole-based semicarbazide and thiosemicarbazide hybrids with antimicrobial and anti-tubercular activity

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Abstract

We report the synthesis and screening of forty novel 4-nitropyrrole-semicarbazide conjugates inspired from the reported bio-potential of bromopyrrole alkaloids and semicarbazide derivatives for antimicrobial activity. Herein, hybrids **5k-5o**, **5r-5s** and **5t** displayed four-fold increased activity (MIC = 0.39 µg/mL) against *E. coli* compared to standard ciprofloxacin. Eight hybrids, **5k-5o** and **5r-5t** displayed equal antibacterial activity (MIC = 1.56 µg/mL) against *K. pneumonia* compared to standard Ciprofloxacin. Hybrid, **5k-5o** (MIC = 0.195 µg/mL) displayed highly potent antibacterial activity against MSSA as compared to standard Ciprofloxacin. Eight-fold superior activity was observed for four hybrids **5k-5m** and **5o** (MIC = 0.39 µg/mL) against MRSA. Further, nine hybrids displayed four-fold superior antifungal activity (MIC = 0.78 µg/mL) compared to standard Amphotericin B. Encouraging MICs of these hybrids recognize them as promising leads for development of potential antimicrobial drugs.

Keywords: 4-Nitropyrrole, semicarbazides, thiosemicarbazides, antimicrobial agent, anti-tubercular agent

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