

A determination of pan-pathogen antimicrobials

While antimicrobial drug development has historically mitigated infectious diseases that are known, COVID-19 revealed a dearth of 'in-advance' therapeutics suitable for infections by pathogens that have not yet emerged. Such drugs must exhibit a property that is antithetical to the classical paradigm of antimicrobial development: the ability to treat infections by any pathogen. Characterisation of such 'pan-pathogen' antimicrobials requires consolidation of drug repositioning studies, a new and growing field of drug discovery. In this review, a previously-established system for evaluating repositioning studies is used to highlight 4 therapeutics which exhibit pan-pathogen properties, namely azithromycin, ivermectin, niclosamide, and nitazoxanide. Recognition of the pan-pathogen nature of these antimicrobials is the cornerstone of a novel paradigm of antimicrobial development that is not only anticipatory of pandemics and bioterrorist attacks, but cognisant of conserved anti-infective mechanisms within the host-pathogen interactome which are only now beginning to emerge. Ultimately, the discovery of pan-pathogen antimicrobials is concomitantly the discovery of a new class of antivirals, and begets significant implications for pandemic preparedness research in a world after COVID-19.

Biography

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