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Short Communication

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Strategies in Medicinal Chemistry to Increase the Duration of Action of Inhaled Medicines for Intracellular Targets

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DESCRIPTION

To help in medication optimization, medicinal chemists use a number of biochemical and cellular studies. The results of these tests have an impact on Structure-Activity Relationship (SAR) marketing decisions. As a result, medicinal chemists must grasp the strengths and limitations of each test used to evaluate manufactured analogues. Their combined skill sets are necessary not only to develop and build robust assays, but also to carry out an efficient screening cascade that involves the selection of various orthogonal and counter assays to evaluate the activity and target(s) of the synthesised compounds. Translational Sciences/National Institutes of Health projects and published scientific literature in which the evaluation of compounds in secondary or orthogonal assays resulted in the discovery of unexpected activities, forcing a reconsideration of the original assay design used to discover the compound's biological activity. The purpose of this perspective is to push toward the development of physiologically appropriate assays capable of capturing the genuine bioactivity of drugs being produced in a medicinal chemistry campaign using these retrospective case studies. Pandemics and epidemics of respiratory viruses are still among the leading causes of illness and mortality across the world. Some pneumonia cases with unknown causes have been recorded in 2019. The epidemiological research revealed following viral isolation and nucleic acid sequencing, the International Committee on Taxonomy of Viruses determined that the pathogenic component was a new coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). COVID-19, which stands for coronavirus disease 2019, is the name given to this illness. With the epidemic's continued expansion, the WHO declared COVID-19 a worldwide pandemic on March 11, 2020 [1]. Extending the duration of action of inhaled medications is a difficult task, and guidance for medicinal chemistry teams is few, especially when the site of action is intracellular. Two-dimensional (2D) structural representations of three-dimensional (3D) molecules and molecular interactions are used largely in the teaching of medicinal chemistry [2]. Because these 2D structures are simple to print, they are commonly used in textbooks, handouts, presentation slides, and tests. The only disadvantage of adopting 2D structural representations is reliance on students' capacity to mentally convert to envision in 3D. Educators in medicinal chemistry want students to understand factors like as chirality, electron distribution, steric bulk, and intra- and intermolecular bonding based on accurate 2D interpretation representations [3]. For many doctor of pharmacy students, their background in organic chemistry and biochemistry is either insufficient or too far in the past. This pilot research had two functions. The first is to help students visualise medicinal chemistry ideas by meeting them where they are in terms of technology and prior chemistry knowledge. The second goal was to see if it was possible to include cutting-edge Augmented Reality (AR) elements into lectures

in terms of both time (faculty preparation and classroom instruction) and student acceptability. To accomplish these objectives, an efficient methodology for the development of AR models was created, followed by the models being presented in chosen medicinal chemistry courses. During the pilot phases, iterative enhancements to both the AR model production procedure and the AR lecture presentation style were developed in response to student input received through anonymous surveys [4].

CONCLUSION

Models have been widely utilised in chemistry education to assist students bridge the gap between the abstract and a reality they can envision and understand. Professors created the first chemistry molecular models out of wood and metal rods. Commercial instructional molecular modelling kits originally became available in the 1940s and are still used in many chemistry classes today. Students may assemble molecules using kits, and this tactile, active learning experience improves their awareness of spatial connections and bonding restrictions. These kits are great for teaching basic principles to beginning chemistry students, but they are time consuming and difficult to use with bigger molecules. When describing drug target interactions in a medicinal chemistry course, both 2D drawings and 3D physical models fail because the intricacy overwhelms both media.

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