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Paradigm shift in cannabis drug discovery: From Deductive to Inductive R&D

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Abstract: Cannabis plants contain hundreds of cannabinoids and terpenes that have multiple therapeutic effects when taken together. Most research into the therapeutic potential of cannabis has used a deductive approach, starting with a specific hypothesis about the effects of a particular strain (chemovar) or compound, such as the sleep-promoting effects of cannabidiol (CBD). However, an inductive approach, which involves a broader screening of a range of compounds or strains to identify those that may be effective for a specific indication, is more risky but has the potential to lead to more clinically efficacious products. Combining deductive and inductive approaches may be the most effective way to fully maximize the therapeutic potential and safety of cannabis-based products. To test such an approach we utilized a well-established in vivo sleep model to screen the effects of THC, CBD, CBN and their various combinations. We found that CBN prolonged sleep duration but not affected sleep latency, while THC had a negative effect on sleep latency and CBD had no effect on sleep. Combinations of THC, CBD, and CBN had a positive effect on sleep latency and a more continuous sleep pattern. Terpene mixtures alone or in combination with cannabinoids had no additional sleep-improving effects. Interestingly, some sleep-promoting combinations had also strong anti-inflammatory effects. These findings highlight the complex interactions between different cannabinoids and terpenes in the cannabis plant and the importance of understanding these interactions in order to develop effective and safe therapeutic products.