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MICROGRAVITY APPLICATIONS IN PHARMACY FOR PROTEIN THERAPEUTICS

**Abstract**

Space-based research applications in protein engineering have recently been very useful in the treatment of infections, inflammations, cancer, and other diseases. The change in the structure of proteins under microgravity has made them useful in therapeutics as the structure of proteins is vital in pharmacy. Microgravity is an outer space condition where the gravitational pull is very low. Although experiments in real microgravity in outer space are rare and expensive, similar experiments are now conducted on the ground using clinostats and random positioning machines (RPMs) (ground simulators). These are using simulated microgravity platforms that have long-term experiment duration of several days and weeks to grow crystals, as crystal growth of proteins needs a good ample period of time to be done. This contributes to a new world of discoveries that will benefit mankind as new medical cures. This review, therefore, documents: the differences and causes of the differences in the protein crystals grown under Earth's gravity and microgravity; some specific benefits of growing protein crystals in microgravity for therapeutics; and also recommends the better use of ground-based microgravity simulations platforms for protein crystals growth.