

Bioavailability enhancement strategies and unlocking the potential of Asian pharmaceuticals.

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Description

Bioavailability enhancement strategies play a vital role in pharmaceutical development, particularly for drugs with low solubility or poor absorption. Bioavailability refers to the fraction of an administered drug that reaches systemic circulation in an active form. Improving bioavailability ensures that an adequate amount of the drug is available at the target site to exert its therapeutic effects. In recent years, researchers have been focusing on developing innovative approaches to enhance bioavailability, and Asian pharmaceutical companies have made significant contributions in this area.

One commonly employed strategy to enhance bioavailability is the use of drug delivery systems. These systems aim to improve drug solubility, stability, and absorption by altering the drug's physicochemical properties or by providing controlled release mechanisms. Nanotechnology-based drug delivery systems, such as nanoparticles, liposomes, and micelles, have gained significant attention due to their ability to encapsulate drugs, protect them from degradation, and enhance their uptake by cells. Asian pharmaceutical companies have been at the forefront of developing and commercializing such drug delivery systems. For example, the Korean company Samyang Biopharmaceuticals has successfully developed a liposome-based drug delivery system for anticancer drugs, improving their bioavailability and reducing side effects.

Another approach to enhance bioavailability is through the use of prodrugs. Prodrugs are chemically modified versions of a drug that undergo enzymatic or chemical transformations in the body to release the active drug. Prodrugs can improve drug solubility, permeability, and stability, leading to enhanced bioavailability. Asian pharmaceutical companies have made significant progress in developing prodrugs for various therapeutic classes. For instance, the Japanese pharmaceutical company Otsuka developed a prodrug of the antipsychotic drug aripiprazole, known as aripiprazole lauroxil, which demonstrated improved bioavailability and extended-release properties.

Furthermore, improving drug solubility is a key focus in bioavailability enhancement strategies. Techniques such as particle size reduction, complexation, and amorphous solid dispersions are utilized to enhance drug solubility and dissolution rates. Asian pharmaceutical companies have been actively involved in the development of these techniques. For example, the Indian company

Sun Pharmaceutical Industries has successfully commercialized an amorphous solid dispersion-based formulation of the antifungal drug itraconazole, known as itraconazole-SRD, which significantly enhances its bioavailability.

In addition to bioavailability enhancement strategies, Asian pharmaceutical companies have been instrumental in unlocking the potential of traditional Asian medicines. Traditional Asian medicines, such as Ayurveda, Traditional Chinese Medicine (TCM), and Kampo medicine, have a long history of use and offer a vast repository of therapeutic knowledge. Asian pharmaceutical companies have been involved in scientific research to validate the efficacy and safety of traditional medicines and develop evidence-based formulations.

By employing modern scientific techniques, such as phytochemical analysis, bioassays, and clinical trials, Asian pharmaceutical companies have been able to identify active compounds, understand their mechanisms of action, and develop standardized formulations. This has led to the development of novel pharmaceutical products based on traditional Asian medicines. For example, the Chinese company Tongjitang Pharmaceutical developed a TCM-based drug called Xianling Gubao, which has been proven to enhance bone mineral density and reduce the risk of fractures in postmenopausal women.

Furthermore, Asian pharmaceutical companies have played a pivotal role in promoting global acceptance and recognition of traditional Asian medicines. Through collaborations with international partners, they have conducted research studies, participated in regulatory discussions, and shared scientific data to build a robust scientific foundation for these traditional medicines. This has resulted in increased awareness and acceptance of traditional Asian medicines in the global healthcare community.

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