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Mini Review

Stable and Cost-Reduce for Drug Development of Bio-Molecules

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Abstract

Biotherapy is widely utilized in the clinical treatment of many diseases. However, most of biotherapeutic molecules are short-live in human body. It costs a lot if we want to keep therapeutic levels of bio-agents in human body without further pharmaceutical modifications. The chemical or pharmaceutical modification systems are major pathways for increasing the efficiency of bio-agents in the clinic. This article addresses this topic.

Keywords: *Pharmaceutical; Drug Development; Cancer Treatment; Diabetes; Bio-Molecules*

Introduction

Biotherapy is widely used in the treatment of different types of human diseases, such as diabetes, cancer, osteoporosis and others [1-8]. As a result, biotherapy is quite a therapeutic routine for future disease treatments in the clinic. However, most of biomolecules are short-live in human body. It cost a lot if we want to keep high bio-molecule levels in human body. More recently, biomolecules are commonly added with chemical ligands or being modified in order to stable drug concentrations and activity in human bodies.

Advantages of bio-therapy

Most biotherapeutic molecules are coming from human bodies, which are commonly low toxicity and less adverse side-effects comparing with chemotherapeutic drugs. They are also high specificity. With the rapid development of biomedical knowledge and technology, this very discipline will surge in the near future.

Limitation of bio-therapy until now

There are a lot of unresolved medical principle, technical limitation and mechanistic elucidation shortage in current bio-therapy study. Much work is required for promotion of bio-therapeutics in protein, peptides, nucleotide therapy against viral infections, metabolic abnormality and cancer.

Despite much usefulness in clinical trials, bio-agents are still very expensive for routine utility in the clinic. Further work is needed to continue our capability and efficiency for disease managements via biotherapy in the future.

New insights and great potentiality

So far as we can see, this key aspect of pharmaceutical science has a great potentiality. If this area of drug developments has been matured, a great variety of new biological drugs may come into the bedside with low toxicity and specificity of drugs.

Current solution to tackle with the problem of the short-live of drug candidates is a key issue in drug developments. Methodology to increase half-life of regulatory/hormonal proteins, peptide, nucleotide segments and polysaccharide in human bodies is multitude; including:

- Chemically modifying
- Stable organic sequences ligands to bio-molecules
- Peroxisome, liposomes and others
- Capsules that carry biomolecules
- And others [5-9].

Best examples

The widest example of bioagents is insulin for diabetes—the safest agent for diabetic treatments. It has long been developed for clinical trials. Usually, the half-life for insulin or other regulatory proteins or peptides (< 60 amino acid) is within 1 hour in human body. Some forms of elongated insulin have been entering into the drug markets now [9].

Similarly, fish calcitonin is now widely used against human osteoporosis in the clinic [7,8]. In the drug production, the S-S bond of eel calcitonin are replaced with C-C bond in the protein (Elcitonin, Japan). This chemically modified molecules have a much longer half-live in human bodies.

Colorectal Cancer Resection

Though there is a long way to go for this pharmaceutical development, stabling biomolecules can promote therapeutic benefits and drug development. Biomolecules delivery systems have proven to be enormous usefulness in experimental setting. Its large-scale clinical applications are expecting. We welcome the boost of such research in the future.

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