

LICENSING OPPORTUNITY

ETH transfer – Linking Science and Business

Trigger-inducible drug depot to replace repetitive injections

Keywords

Drug depot, trigger-inducible release, controlled release, growth factor, biopharmaceutical, EPO, insulin, pain therapy, tissue engineering

Summary

A drug depot was developed which can be triggered by an orally available pill to release the embedded drug on demand in a dose-dependent way. The drug depot is expected to be applicable in many disease areas by the incorporation of specific payload drugs. A daily injection will be replaced by a daily pill.

Background

Many (chronic) diseases require the repeated injection of drugs that cannot be applied orally. These patients must repeatedly inject the drug, a painful task compromising the quality of life or they must implant a drug pump associated with a surgical intervention. Therefore, an injectable drug depot that releases a defined amount of drug in response to an externally applied stimulus will significantly improve patient compliance.

Patent Status

- Patent pending PCT

Invention

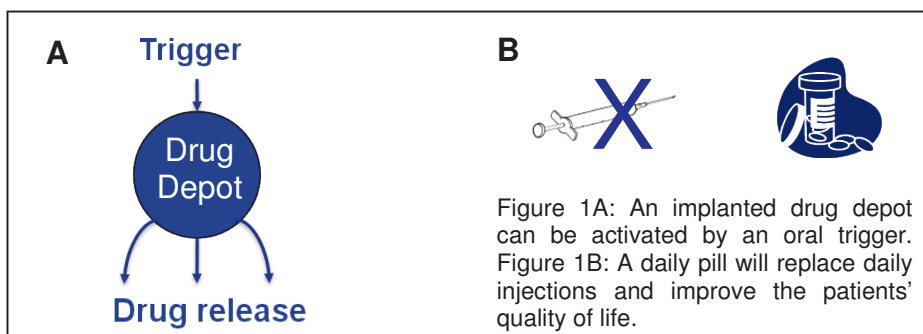
The invention relates to a drug depot that releases its therapeutic drug payload in response to an externally applied trigger (Fig. 1A). The drug payload is incorporated into a biomaterial, which can be implanted into the body. Whenever a dose of the drug is needed, an orally available pill containing the trigger stimulus can be taken to induce the biomaterial in order to release the required drug dose. Thus, repeated injections of the drug can be replaced by one injection of the depot and subsequent intake of an orally available pill (Fig. 1B). The drug depot has been validated in culture with human cells and it has been shown that an embedded growth factor as model drug was dose-dependently released as a function of the trigger concentration. The drug depot is made of clinically approved materials as well as humanized sensor components in order to ensure maximum biocompatibility. Very low trigger concentrations are needed. As trigger it's foreseen to use FDA approved substances with known pharmacokinetics and neglectable side effects.

Features & Benefits

- Considerable improvement of life
- Repeated injections are replaced by one injection and subsequent oral intake of a pill.
- First biomaterial-based trigger-inducible drug depot
- Fully humanized system
- Very low trigger doses needed
- Release over several weeks

Field of Application

- Patient-compliant administration of drugs that need repetitive injections e.g.: growth factors, antibodies, pain relievers and hormones
- Can be used for diseases e.g.:
 - Cancer
 - Hormone-related disorders
 - Pain therapy
 - Diabetes
 - Kidney failure
- Very well suited for elderly and children
- Tissue engineering in bone regeneration. Biomaterial can be used as smart scaffold



References

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- Alexander, C. Nature Materials, 2008, 7: 767-768

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