

LICENSING OPPORTUNITY

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Improving artificial insemination by hormone-induced release from microcapsules

Keywords

Microcapsules, Trigger-inducible release, Degradable polymer, Genetically engineered cells, Artificial insemination, Hormone, Sperm cells, Luteinizing hormone, Drug release, Metabolites

Summary

The presented medical device for timely optimal release of sperm cells enables more flexibility and higher chances for success in artificial insemination. Semi permeable microcapsules were developed as artificial insemination device reacting on the rising level of Luteinizing Hormone (LH) in the uterus (Fig. 1). The technology has potential to be used for artificial insemination in humans, bovine, horses, sheep, dog, etc. The device can also be used to release a specific content, e.g. a therapeutic drug triggered by a signaling compound for the disease, e.g. a hormone or metabolite.

Patent Status

- Patent pending EP, US and CA

Invention

A genetically engineered cell construct is added to cellulose microcapsules. The capsules are a vehicle to add another compound e.g. sperm cells or a drug. Once the synthetic network is switched on (triggered by e.g. LH) and the polymer capsule will be degraded leading to the release of sperm cells.

The invention has been tested in bovine and has shown to lead to higher flexibility for inseminators to match the LH peak with the timing for insemination.

Features & Benefits

- Increased flexibility in timing insemination and sperm release
- Semi permeable, degradable and freezable microcapsules (< 50 kDa)
- The capsules can be placed into the uterus or other cavity and can be constructed for a timely release based on an elevated protein or metabolite level

Field of Application

Veterinary applications

- Artificial insemination in cows and other mammals (e.g. horses, sheep, dogs, cats, etc.)
- Hormone peak triggered drug release in cows and other mammals

Human applications:

- Medical device supporting artificial insemination
- Release of a specific content, e.g. a therapeutic drug (> 50 kDa) triggered by a signaling compound for the disease, e.g. a hormone or metabolite related reproductive diseases

References

- Kemmer, et al. A designer network coordinating bovine artificial insemination by ovulation-triggered release of implanted sperms; J. of Controlled Release 150 (2011) 23–29.

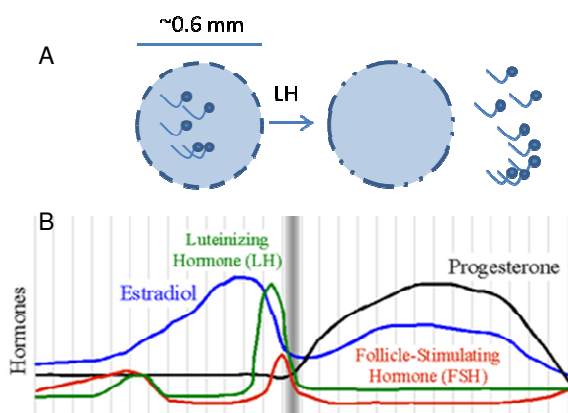


Fig. 1A: Encapsulated sperm cells will be released by a triggered reaction based on the rising LH peak in the body. 1B: Graphic representation of the hormone cycle in women.

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