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PHARMAPEDIA

PSGCP E-News Letter

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FDA Approves First Monoclonal Antibody Injection to treat type I Diabetes



The U.S Food and Drug Administration approved Tziel (teplizumab-mzwv) injection which is a humanized anti-CD3 monoclonal antibody. It is the first approved treatment indicated to delay the onset of stage 3 type I diabetes in adults and in pediatric patients.

Tziel binds to certain immune system cells and delays progression to stage 3 type 1 diabetes. Tziel may deactivate the immune cells that attack insulin-producing cells, while increasing the proportion of cells that help moderate the immune response. Tziel is administered by intravenous infusion once daily for 14 consecutive days.

A randomized, double-blind, event-driven, placebo-controlled trial showed that 45% of the 44 patients who received Tziel were later diagnosed with stage 3 type 1 diabetes, compared to 72% of the 32 patients who received a placebo. **Reference:** <https://www.fda.gov/news-events/press-announcements/fda-approves-first-drug-can-delay-onset-type-1-diabetes>

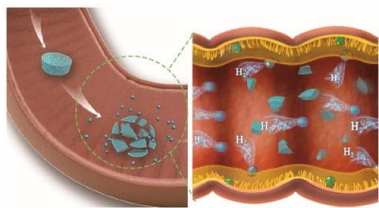
Biopolymer-Based Nano systems for siRNA Drug Delivery to treat Breast Cancer

Biopolymers, such as alginate, pullulan, cellulose, polylactic acid, chitosan, and exosomes have been efficiently utilized in siRNA drug delivery to solid tumours. These biopolymeric siRNA drugs can shield drugs from pH degradation, extracellular trafficking, and nontargeted binding sites and are consequently suitable for drug internalization in a controlled-release fashion.

Breast cancer is the second leading cause of death in woman after lung cancer world-wide. Biopolymers have significant roles in inhibiting drug resistance in breast cancer, impeding breast cancer stem cells (BCSCs). BCSCs utilize different cellular mechanisms, including membrane transporters, anti-apoptotic, pro-survival, and self-renewal-linked signaling pathways.

Bio polymers may disrupt these mechanisms and hence impede breast tumours, inhibiting the BCSCs, and the induction of apoptosis. PEG-modified chitosan was synthesized for survivin-targeted siRNA delivery to breast cancer cells to inhibit breast tumours and to prevent metastasis. The outcome of the study demonstrated that siRNA loaded in PEGylated chitosan (PEG-chitosan-siRNA) delivered to breast cancer cells showed enhanced cellular uptake and inhibited 4T1 tumour cell growth significantly. **Reference:** <https://www.mdpi.com/1999-4923/15/1/153>

Micromotor Based Mini-Tablet for Oral Delivery of Insulin



Diabetes is a metabolic disorder characterized by hyperglycaemia due to defective insulin secretion or its biological dysfunction. However, frequent subcutaneous injection of insulin often results in discomfort and local tissue infection.

This study demonstrates the successful fabrication of a mini-tablet system based on self-propelled micromotors with biocompatibility and biodegradability for oral colon administration of insulin. The insulin layer is first constructed onto the surface of a magnesium based micromotor via electrostatic interactions, followed by a tableting process.

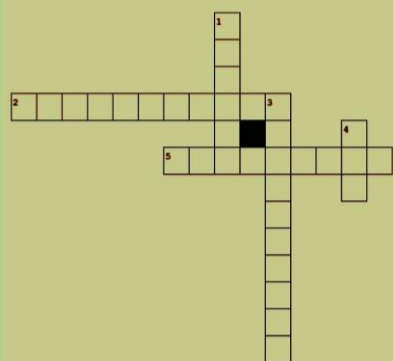
The resulting mini-tablets are then coated with esterified starch with colonic degradation capability, thus achieving controlled release of the embedded micromotors in the colon region. In the meantime, autonomous movement of the released micromotors with a speed up to 76.22 $\mu\text{m/s}$ further results in enhanced colonic uptake and absorption of insulin, realizing long-term control of blood glucose for more than 5 h. **Reference:** <https://pubs.acs.org/doi/10.1021/acsnano.2c07953>

Novel AI-based estimator for manufacturing medicine

A collaborative research team from the MIT-Takeda Program combined physics and machine learning program (**physics-enhanced autocorrelation-based estimator (PEACE)**) could change pharmaceutical manufacturing processes for pills and powders, increasing efficiency and accuracy and resulting in fewer failed batches of pharmaceutical products.

In pharmaceutical manufacturing, determining whether a compound is adequately mixed and dried ordinarily requires stopping an industrial-sized dryer and taking samples off the manufacturing line for testing. the MIT-Takeda team decided to illuminate particles with a laser during filtration and drying, and measure particle size distribution using physics and machine learning.

A physics-derived equation describes the interaction between the laser and the mixture, while machine learning characterizes the particle sizes. The process doesn't require stopping and starting the process, which means the entire job is more secure and more efficient than standard operating procedure. The machine learning algorithm also does not require many datasets to learn its job, because the physics allows for speedy training of the neural network. **Reference:** <https://news.mit.edu/2023/ai-based-estimator-manufacturing-medicine-0503>



CROSSWORD PUZZLE

Across

1. Bullet shaped suppositories is used in which part of body
2. Reversible gel-sol formation with no change in volume (or) temperature
3. The Regulatory agency for Brazil

Down

1. Equipment used in filling of liquids in capsule formulation
2. The temperature at which solubility of surfactant is equal to CMC

ANSWERS FOR THE PREVIOUS E-NEWSLETTER PUZZLE:

1. POSOLOGY 2. LAMINATION 3. GENERIC DRUG 4. NSAIDS 5. LINCTUSES

Send your correct answers to psgcp.ceutics@gmail.com. The first three participants with correct answers will be acknowledged in the next issue.

CORNER OF EXCELLENCE

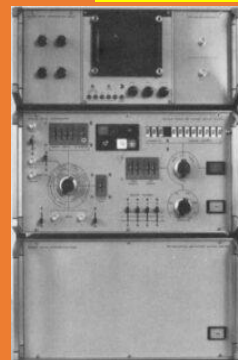
Tata fellowship

V.Narmatha, P.Bharathi, M.Gayathri, R.Shivani, and G. Mythili

Summer Research Fellowship program by IAS, INSA, NAS.

Rincy Roy (M.Pharm 2nd year) were selected for SRFP at CSIR-IICT, Hyderabad.

THE BEAUTIFUL OLD



The first commercial Malvern Correlator, 1971 (K7023) used for particle size determination.

NATIONAL LEVEL WORKSHOP ON NANOMATERIALS CHARACTERIZATION TECHNIQUES (NMCT 2023)

JULY 13 & 14, 2023

Scan for registration



https://docs.google.com/forms/d/e/1FAIpQLSdCB17KPKf_7eOkGkqahBjO6QY78IEkmcgtVMlhVNuOm_p00g/viewform

CORNER OF APPRECIATION

Congratulating the participants of previous newsletter puzzles-

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