

“CarreTab”—Drug Carrier Tablet Technology

Carrier Tablet Technology (CarreTab) was developed to reduce drug manufacturing costs while enhancing quality.

This is achieved by using one common matrix for all drugs made in a manufacturing plant which reduces: (1) the bill of materials (BOM), (2) tooling change over time from one product to another, (3) cycle times, (4) cleaning times between batches and between products, and (5) cleaning frequency and cleaning validation, thereby shortening overall manufacturing cycle times significantly. It also enhances product quality by applying process analytical technology (PAT) in-line more effectively and efficiently than current methods. There are two key areas in this dosage form design. One is the placebo carrier tablet, which has specific concavities on the surface suitable for each dose load where the nano-formulated drug is deposited. The second is the application of nanotechnology to formulate the drug where the drug may be super-concentrated in a small volume of a suitable polymer mix matrix to form a “dosing disk”, which can be then adhered onto a tablet. This disk may be analyzed in-line or detached physically from the carrier tablet for chemical analysis. The ability to separate the intact dosing disk from the carrier tablet by physical means eliminates the need for sample preparation in the analytical laboratory, minimizing the chemical extraction procedure used in most chemical analyses.

There are cost savings in the following operations, including weighing and dispensing of raw materials (decreased BOM, number of ingredients for all products in a plant is curtailed dramatically, number of containers used for different raw materials is also cut down), Manufacturing Cycle Time (shortened by minimizing cleaning steps and change overs) and laboratory analysis (testing time is shortened by eliminating the chemical drug extraction process of the tablet used in conventional tablets).

Advantages/Benefits

- It will decrease manufacturing cost by reducing cycle time in manufacturing and thus offer better use of resources
- This design will minimize physical contact and possible interaction between the active ingredient of the medication and the tablet excipients
- This technology will facilitate accurate and easier detection of active ingredients in the drugs by IR reading devices associated with manufacturing process
- The dosing disk on the surface can be removed and used for analytical testing, thus simplifying analytical laboratory work.

Status of Development

- Three drugs (hydrocortisone, amlodipine, and levothyroxine sodium) were successfully formulated using the CarreTab technology
- Small molecules carrier CarreTab with hydrocortisone was successfully evaluated with IR used for PAT.

Patent Status

PCT filed on 4 November, 2017.

Information on Inventor



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Dr. Nieves is Clinical Assistant Professor at NSU's Department of Pharmaceutical Sciences. As a former Director of R&D in the pharmaceutical industry, Dr. Nieves led the development of many drugs available in the U.S. market today. His research interests include the application of nanotechnology in the development of novel molecular carrier systems and new drug design.

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