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Biotechnological exploitation of bacteria for PHB synthesis: Pharmaceutical applications

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There has been a considerable interest in development of biodegradable polymers such aspoly beta hydroxy butyrate(PHB) from bacterial origin which could help in solving probable problems due to use of synthetic polymers. Many synthetic polymers are being used now-a-days in drug delivery systems. But synthetic polymers have certain disadvantages such as their non-biodegradability and so probability of bioaccumulation. Such accumulations for long time in body are not good. This explains a need of easily biodegradable polymer. Bacteria can synthesize a wide range of biopolymers which are biodegradable, biocompatible andhave material properties suitable for medicalapplications.

Bacterial polymers such as PHB, if modified to make functionally more effective can be better for use in pharmaceutical field. These studies started with screening of better producer of PHB from soil.

This paper represents a work on screening of bacterial isolates capable of producing PHB, and production of PHB using laboratory scale fermentation procedures. Using nutrient agar we could screen four bacteria from soil, capable of producing PHB, using Sudan black-B staining. We also used a pure bacterial culture of Alcaligeneslatus obtained from MTCC Chandigarh as a producer of PHB. Out of these five bacterial isolates, Alcaligeneslatus found producing PHB in relatively more amounts yielding about 25%. We used Alcaligeneslatus for production of PHB in large quantity.

Solubility enhancement of poorly water soluble drug (Ritonavir) using hot melt extrusion

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The enhancement of oral bioavailability of poorly water soluble drugs remains one of the most challenging aspects of drug development. Complexation, precipitation, adsorption, salt information, particle size reduction, etc. have commonly been used in industry to solubility of the drug, there are practical limitation with these techniques the desired bioavailability enhancement may not always be achieved. Therefore formulation approaches are being explored to enhance bioavailability of poorly water-soluble drugs. One such formulation approach that has been shown to significantly enhance absorption of such drugs is to formulate prepare solid dispersion using Hot melt extrusion. Ritonavir is anti HIV drug (BCS class II), which is often administered orally. Ritonavir exhibits very slightly soluble and as a consequence it exhibits low bioavailibity after oral administration. Therefore the improvement of Ritonavir dissolution from its oral solid dosage forms is an important issue for enhancing its therapeutic efficiency. The present study was enhancement of dissolution rate of poorly water soluble drug. The solid dispersion was using Soluplus as carrier where Leutrol F 68, Leutol 127, TPGS was selected as Plasticizer. By Hot melt extrusion the resultant complexes were evaluated for drug content, dissolution rate, XRD, FTIR, DSC and SEM.

Development and validation of HPLC-UV method for the determination of natamycin in ophthalmic dosage form

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A simple, sensitive, precise and accurate reversed phase high performance liquid chromatographic (RP-HPLC) method has been developed for the estimation of natamycin from ophthalmic dosage form. The method was developed using a Waters Symmetry shield C18 (250 mm × 4.6 mm, 5.0 μ) column with a mobile phase consisting of Acetonitrile: Sodium acetate buffer, pH 5.5 (38: 62 v/v); at a flow rate of 1.0 mL min^{-1}. The UV detection was achieved at 303 nm, over a concentration range of 0.312 to 20 μg mL^{-1}. The retention time of natamycin was 6.02 minutes. The method was successfully validated in accordance to ICH guidelines acceptance criteria for specificity, linearity, accuracy, precision, robustness, ruggedness and system suitability. Intra-day and inter-day assay accuracy and precision of the natamycin were less than 2%, and the average recovery were in the range of 98–102%. The method was successfully applied for analysis of natamycin in the presence of excipients in commercially available ophthalmic dosage form.