INNOVATIVE METHODOLOGY FOR NANOENCAPSULATION OF MONTELUKAST IN CYCLODEXTRIN

TECHNOLOGY SUMMARY

Cyclodextrin is a nano-sized capsule that allows increasing the stability and aqueous solubility of active pharmaceutical ingredients such as montelukast. This technology comprehends an alternative method to obtain an amorphous solid composed by montelukast and cyclodextrin. In alternative to conventional methodologies, this method allows the encapsulation to occur without requiring the use of solvents and the formation of degradation products.

BENEFITS

SIMPLE PREPARATION METHOD

WITHOUT SOLVENTS

ELIMINATION OF COSTS related with the use, drying and disposal/recycling of solvents.

HIGHER STABILITY IN AQUEOUS SOLUTION: at least four times higher compared to pure montelukast.

AMORPHOUS SOLID PRODUCT

LONG SHELF LIFE UNDER AIR

DISSOLUTION EQUIVALENT TO THAT OF PURE MONTELUKAST

CONTEXT

Montelukast is an active pharmaceutical ingredient used to control asthma, seasonal allergic rhinitis and chronic obstructive pulmonary disease. Being sensitive to light and humidity, montelukast is difficult to handle and formulate. Indeed, the current paediatric formulation, which comprises sachets of water-dispersible powder, needs to be consumed within 15 minutes after wetting.

This technology allows preparing a pre-formulation of montelukast without the contact with any solvent. The resulting product is an amorphous solid, stable to normal air humidity for at least three months and remains stable for at least four hours in water-dissolved state, while pure montelukast starts degrading after one hour.

APPLICATIONS

This method for nanoencapsulation of montelukast in cyclodextrin can be applied in:

PHARMACEUTICAL FORMULATIONS

INNOVATIVE METHOLOGY FOR NANOENCAPSULATION OF MONTELUKAST IN CYCLODEXTRIN

IP RIGHTS

Pendant patent application.

DEVELOPMENT STAGE

TRL 4 – method tested and validated in laboratory.

KEYWORDS

MONTELUKAST

CYCLODEXTRIN

SOLID-SOLID REACTIONS

STABILITY

SOLUBILITY

CONTACT

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Technology #16029

DEVELOPED BY

Researchers from the Organic Chemistry, Natural Products and Foods Stuffs Research Unit (QOPNA) and from Aveiro Institute of Materials (CICECO) from the University of Aveiro.

BUSINESS OPPORTUNITY

License agreement.

Testing of new applications.

PARTNERSHIP

The University of Aveiro seeks partners within pharmaceutical industry.

TRL: Technology Readiness Level – more information in https://ec.europa.eu/research/participants/portal/desktop/en/support/faqs/faq-2890.html