Method for manufacturing carrier containing e.g. proteins for human during oral drug delivery operation for food and drug administration application in pharmaceutical industry, involves providing active ingredient to core layer - DTU Orbit (15/05/2019)

**Method for manufacturing carrier containing e.g. proteins for human during oral drug delivery operation for food and drug administration application in pharmaceutical industry, involves providing active ingredient to core layer**

**NOVELTY** - The method involves preparing a multi-layered film comprising a core layer and a barrier layer, where the core layer comprises active ingredient. The multi-layered film is subjected to a hot embossing step using an embossing stamp including protrusions that allows for generation of the micro-containers containing an active ingredient or containing a core layer that is configured to accept the active ingredient such that the barrier layer partially encloses the core layer. The active ingredient is provided to the core layer when the core layer is configured to accept the active ingredient.

**USE** - Method for manufacturing a multi-layered micro-container i.e. carrier, containing an active ingredient e.g. small organic molecules, proteins, peptides, vitamins, antibodies, antibody fragments, vaccines, RNA, DNA and antibiotics, for a patient e.g. human and animal, during an oral drug delivery operation for a food and drug administration (FDA) application in a pharmaceutical industry.

**ADVANTAGE** - The method enables allowing an individual micro-structure stuck in an embossing stamp to be demolded under the conditions such that demolding operation is done by treating elastically or plastically deformable layer to increase stiction of the release layer. The method enables manufacturing the micro-container including an outer diameter of 200-500 pm and a height of 2-70 pm such that wall thickness is larger than 5 m to increase geometrical stability and reduce buckling. The method enables manufacturing a multi-layered micro-container to enable unidirectional release at a site of absorption, thus increasing bioavailability of drugs.

**DETAILED DESCRIPTION** - The barrier layer is made out of polycaprolactone (PCL), polyactic acid (PLA), polyglycolic acid (PGA), hydroxypropylmethyl cellulose (HPMC), polymethacrylate (PMMA), Eudragits Poly-methacylic acid-co-methyl methacrylate, ethyl cellulose (EC), polyvinyl alcohol (PVA), polyvinylpyrrolidone (PVP), polyethylene glycol (PEG), polyethylene glycol methacrylate (PEGMA), polyethylene glycol dimethacrylate (PEGDMA), poly-lactic-co-glycolic acid (PLGA), polyacrylic acid (PAA) and copolymer. An INDEPENDENT CLAIM is also included for a micro-container.

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**General information**
Publication status: Published
Organisations: Department of Micro- and Nanotechnology, Nanoprobes, Biomaterial Microsystems
Contributors: Nagstrup, J., Keller, S. S., Boisen, A., Petersen, R. S.
Publication date: 2015

**Publication information**
Country: Denmark
Patent number: WO2015028670-A2
Original language: English
Source: PublicationPreSubmission
Source-ID: 110643269