Trends in oral solid dosage forms: Review of 2022 EMA approvals

Background

This post is a review of 2022 EMA product approvals and provides an insight into current formulation development strategies being adopted for orally administered NCEs. Data are primarily extracted from EPAR documents, which can be found on the EMA website.

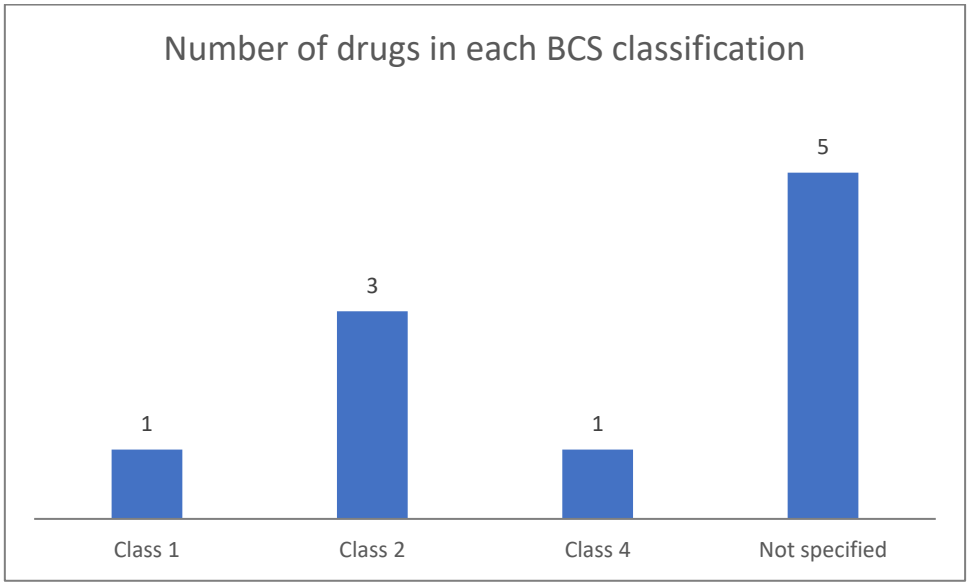
Ten of the new medicines approved by the EMA in 2022 were orally administered solid dosage forms containing an NCE; these medicines are the subject of this review.

Drug Substance

Six of the NCEs are in the form of salts, namely hydrochloride (2), sulfate (2), succinate (1) and sodium (1).

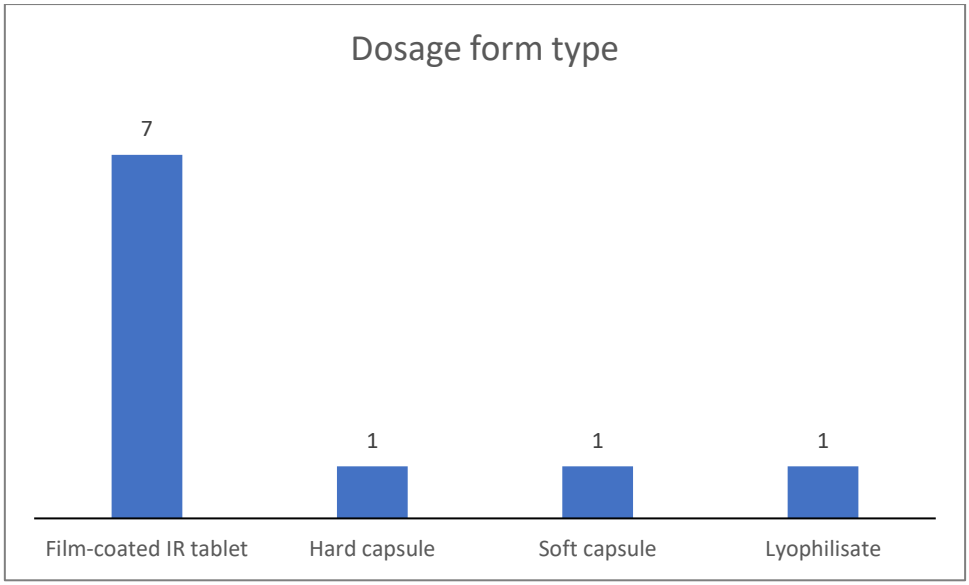
The average molecular weight (base form) is 592 g/mol (range 376-1215).

The BCS Classification was disclosed for only five of the ten NCEs; these were predominantly Class 2 (low solubility, high permeability).



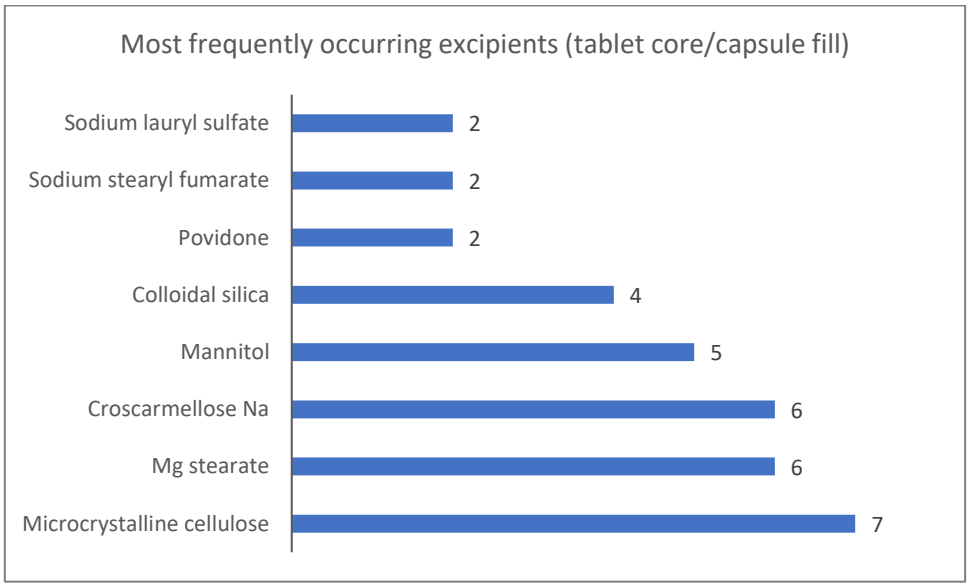
Dosage form types

Film-coated immediate release tablets are the predominant dosage form. In addition, there is one hard capsule, one softgel (LUPKYNIS®) and one oral lyophilizate (VYDURA®); the latter is a migraine treatment.



Excipients

Excipients appearing in two or more of the formulations are presented in the chart below; film coating ingredients are excluded.



The following excipients appear in only one product: crospovidone, sodium starch glycolate, lactose monohydrate, pregelatinized starch, poloxamer, copovidone, gelatin, mint flavour, sucralose, vitamin E TPGS, ethanol, polysorbate 40 and medium chain triglycerides.

The single hard capsule formulation uses a gelatin shell.

The tablet film coatings are based on HPMC (4 products) or PVA (3 products).

Amorphous solid dispersion (ASD)

Two products contain drug in the form of a spray-dried ASD:

- ZOKINVY® (lonafarnib) capsules: API spray-dried with povidone to form an amorphous spray-dried dispersion (SDD)
- SUNLENCA® (lenacapavir) tablets: API spray-dried with "two excipients" – these are not identified in the EPAR but, based on the list of excipients used in the tablet core, they are presumed to be mannitol and copovidone

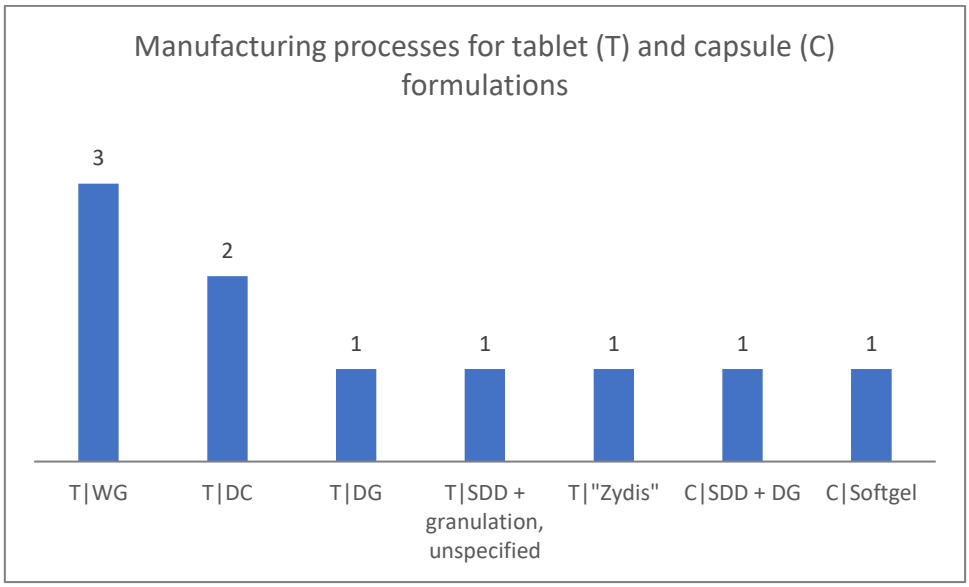
Manufacturing process

For the tablets, the majority are produced by granulation processes. The granulation process used to manufacture SUNLENCA® tablets (see above) is not disclosed, although it is likely to be dry granulation.

The lyophilizate is made using Catalent's Zydis technology.

The softgel product is manufactured by dissolving the drug substance in a non-aqueous vehicle followed by encapsulation into the soft gelatin shell.

For the hard capsule product (ZOKINVY®, see previous section), the spray-dried dispersion is incorporated with the other excipients using a dry granulation and blending process.



WG= wet granulation; DG = dry granulation; DC = direct compression

Comments

The number of oral solid NCE products approved in 2022 was relatively small. Six of the ten products were conventional in terms of formulation technology and manufacturing process.