Heavy drugs: an emerging tool for an improved half-life of the drugs and lead compounds

Editorial

The deuterium switching for hydrogen is an emerging trend for the past decade to improve the bioavailability of the lead compounds and drugs. Since 1970, there are totally 412 patents (obtained by SciFinder search) have been registered with the deuterated analogs and out of them 319 patents have been filed within the past seven years (from 2010, ~75%), implicated the paramount importance of the deuteration of drugs. However, the following points have to be considered when you change hydrogen to deuterium: i. Is it really going to give the difference in biological properties? ii. Not only metabolism, sometimes the deuteration can prevent or slow down the epimerization or the interconversion of certain enantiomers (when you exchange at the chiral center). iii. For an improved half-life, C-D bond breaking should be the key step in the metabolic process. If an alternative metabolic pathway is predominant, then there won’t be an improved half-life and the deuteration strategy may not be positive. iv. To get a patent for a reported molecule: It is obvious to improve the pharmacokinetic profile of a drug or lead molecule by replacing deuterium with the hydrogen, hence unexpected results should be achieved by deuteration. Otherwise, the patent officer will raise an objection (obviousness) for the claim/composition of matter.

Conclusion

To conclude, deuteration strategy is not going to complement for all cases, but there will be situations where you can improve the function of the compounds.

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Conflict of interest

The author declares no conflict of interest.

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