Environmental Risk Assessment Summary
Pertuzumab

Introduction

The publication of environmental risk assessment summaries is part of Roche's engagement on developing a better understanding of issues regarding pharmaceuticals in the environment (PiE).

New pharmaceutical substances are investigated for biodegradability and initial ecotoxicity during their development. For registration, a full state-of-the-art environmental risk assessment is developed based on chronic environmental effects and advanced environmental fate data, as required by the pertinent regulations. While not a regulatory requirement, Roche also investigates older pharmaceutical substances, normally at a simpler scale, in order to assess their environmental risks.

The EMA Guideline on Environmental Risk Assessment (ERA) for Non-GMO Human Medicinal Products [1] requires an ERA for the Marketing Authorisation Application (MAA) of all new medicinal products in the European Union. For proteins and peptides, however, the 'ERA may consist of a justification for not submitting ERA studies, e.g., due to their nature they are unlikely to result in a significant risk to the environment'.

Summary

Pertuzumab is a recombinant humanised monoclonal antibody. It is the active pharmaceutical ingredient used in the Roche product Perjeta [3].

Perjeta is used in the following situations [2]:

- treatment of metastatic breast cancer that has not already been treated with chemotherapy medicines or medicines designed to target HER2, or for breast cancer that has come back locally after treatment and cannot be removed by surgery. In these cases, Perjeta is used with trastuzumab and docetaxel (other cancer medicines);
- treatment of locally advanced, inflammatory or early-stage breast cancer at high risk of coming back, in combination with trastuzumab and chemotherapy, before the patient undergoes surgery;
- treatment of early breast cancer at high risk of coming back, in combination with trastuzumab and chemotherapy, after the patient has had surgery.

Ecotoxicity and biodegradability tests with Pertuzumab were not performed. However, acute ecotoxicity limit tests with green algae, daphnids and fish with other monoclonal antibodies consistently showed no adverse effects at the only tested concentration of 100 mg/L nominal concentration relating to the active substances, Also biodegradability tests with other monoclonal antibodies showed ready biodegradability [4].

Considering human metabolism and the suggested rapid biodegradability and the suggested low acute ecotoxicological properties of Pertuzumab, no exposure levels of concern to the environment are to be expected. This confirms the general finding that monoclonal antibodies and other protein or peptide active pharmaceutical substances are not expected to pose any risk to the environment [4].

References

[1] European Medicines Agency (EMA) (2006/2015): Guideline on the environmental risk assessment of medicinal products for human use. European Medicines Agency, Committee for Medicinal Products for Human Use (CHMP), 01 June 2006, EMA/CHMP/SWP/447/00 corr 2

[2] European Medicines Agency (EMA) (2018): EPAR summary for the public. Perjeta / Pertuzumab. EMA/377646/2018, June 2018

[3] F. Hoffmann-La Roche Ltd (2020): Safety data sheet for Perjeta, 19 August 2020. https://www.roche.com/sustainability/environment/global_product_strategy_and_safety_data_sheets.htm

[4] Straub JO (2010): Protein and Peptide Therapeuticals: An Example of "Benign by Nature" Active Pharmaceutical Ingredients. *In* Kümmerer K, Hempel M, eds: Green and Sustainable Pharmacy. Springer, Heidelberg, pp 127–133