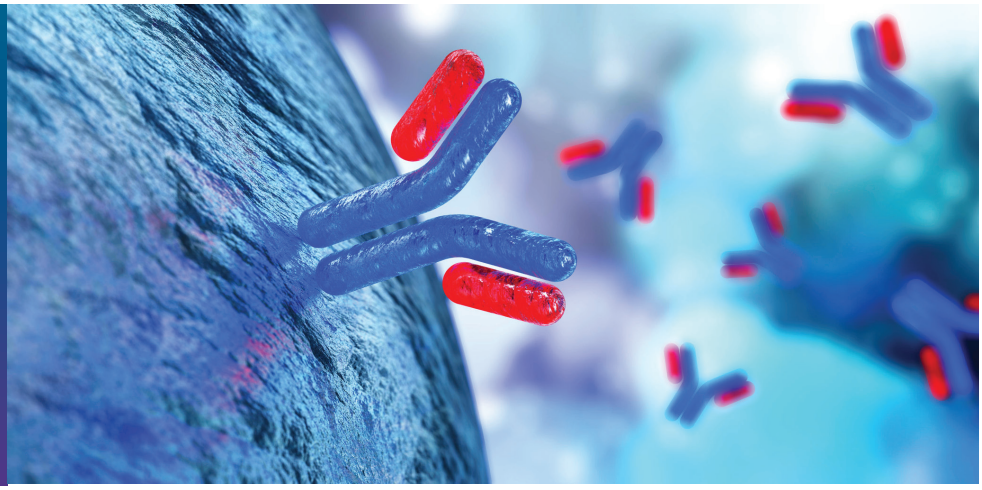
TEVADAPTOR®

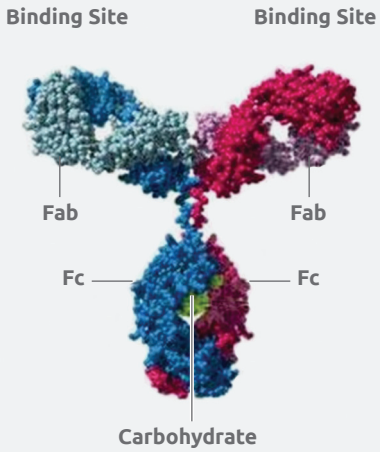
Keeps you safe in a click

Safe handling of monoclonal antibody based drugs (mABs)



The 2016 NIOSH list of hazardous drugs includes 4 mABs (ado-trastuzumab emtansine, brentuximab vedotin, gemtuzumab ozogamicin, pertuzumab)[1]. Also, NIOSH is considering adding the following mABs to the list: Bevacizumab, Blinatumomab, Inotuzumab ozogamicin, Trastuzumab[2].
It has been argued that the larger molecular weight of hazardous monoclonal antibodies (mABs) may prevent their dermal or nasal absorption via occupational exposure. However, the concern in occupational health is whether these drugs can possibly attain a detectable (not necessarily therapeutic) level through repeated dermal and/or nasal exposure. Currently, there is no direct evidence to support a particular molecular weight above which a drug cannot achieve a detectable level following repeated occupational exposure.

Therefore, the repeated exposure of healthcare workers to hazardous monoclonal antibodies (mABs) should be kept to a minimum, as a precaution[3].
This is an evidence of the growing awareness in the medical community to the occupational risks of mAB drugs.



What is Tevadaptor®?

TEVADAPTOR® is a closed system transfer device used by pharmacists, nurses or other healthcare professionals for safe reconstitution of drugs, including cytotoxic drugs and monoclonal antibodies, for infusion, injection, or instillation, through the use of several protection layers[4]:

- Elastomeric septa that prevent the unintentional release of drug in droplet form[5]
- A hydrophobic and oleophobic 0.2 µm membrane that prevents bacterial contamination by incoming air and the escape of hazardous aerosols and drops[6]
- An active carbon matrix that is highly efficient in adsorption of drug vapors[7,8]

TEVADAPTOR®

Keeps you safe in a click

Advantages of Using Tevadaptor® with mABs

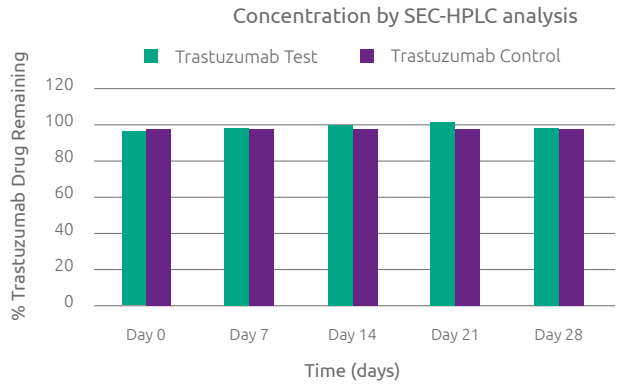
- Protection of the user (pharmacist, nurse): prevents the escape of hazardous drug aerosols and the release of drug in droplet form.
- Protection of the drug from microbial contamination[6,9] : the 0.2 µm membrane cleans the incoming air thus preventing bacterial contamination of the sterile drug solution.
- Economical savings[10]: drug costs, especially for biological drugs, represent a significant part of the total healthcare spend. According to the study detailed below, by using a CSTD which forms a drug storage container (vial adaptor mounted on a drug vial), multiple withdrawals of a drug over an extended time period can be performed. This enables vial sharing, which leads to reduction of drug wastage and better usage of drugs.

Tevadaptor®'s Compatibility with mAB Drugs

A study was performed in order to show that handling of a mAB based medication using the Tevadaptor® system does not alter the mAB's structure and its biological activity[11]. The study was performed using single dose vials of Trastuzumab 150 mg that did not contain any preservative. The evaluation was done by connecting Tevadaptor® Vial Adaptors to drug vials, reconstituting according to manufacturer's instructions, and storing for up to 28 days at 2-8°C while protected from light. Sampling was performed by testing Trastuzumab drug vials fitted with Tevadaptor® on days: 0, 7, 14, 21 and day 28. On each testing day, control Trastuzumab vials were freshly prepared by reconstitution using standard needle and syringe. Both test and control Trastuzumab samples were subjected to a range of physicochemical and biological tests for a full assessment of stability.

No significant differences were observed between test and control samples in all the parameters that were tested:

- Reverse Phase (RP) HPLC
- Size-Exclusion (SEC) HPLC
- Cation Exchange Chromatography
- Capillary Gel Electrophoresis (CE-SDS-PAGE)
- pH
- Biological Activity - Cell Proliferation Assay
- Biological Activity - ELISA
- Sterility Test - all test infusions remained clear and showed no signs of growth.



All data obtained from Trastuzumab test solution (using Tevadaptor®) was within the acceptance criteria ±5% of control solutions
* All drug products were using a validated stability indicating SEC (HPLC)-DAD method

This study applied a significant number of robust scientific techniques. It presents a compelling body of evidence to support the use of Tevadaptor® with Trastuzumab, as an example of a monoclonal antibody (mAB) drug that can be safely stored within a closed system for up to 28 days at 2-8°C, with no deleterious effect on the drug either from a physicochemical viewpoint or a biological mode of action view.

References

1. https://www.cdc.gov/niosh/docs/2016-161/default.html
2. https://www.cdc.gov/niosh/docket/review/docket233b/pdfs/233-BRevisedNIOSHTable42-14-18.pdf
3. de Lemos et al., 2018, Safe handling of monoclonal antibodies: Too large to be hazardous?, J Oncol Pharm Practice, 24(3):218-220
4. Tevadaptor Instructions for use
5. Tevadaptor Data on File. Doxorubicin data. study 152.
6. Tevadaptor Data on File, Maintenance of sterility of Tevadaptor CSTD when used under uncontrolled conditions, Aminolab report No. 009970.19, 2019
7. Tevadaptor Data on File, Evaluation of possibility of Tevadaptorto prevent escape of cycloposphamide, Nextar report 5860840RE/02, 2016
8. Flexzorb® Activated Carbon Cloth Product Brochure published by Chemviron Carbon, Cloth Division, United Kingdom http://www.chemvironcarbon.com
9. A.S. Wilkinson et al. Extension of the beyond use date (BUD) of hazardous drugs using the Tevadaptor® (OnGuard™) closed system transfer device (CSTD) as a container system for preservative free single use vials for up to 28 days. Poster session, ECOP 2014
10. Juhász et al., 2016, Responding to drug shortages and rising costs: IV chemotherapy drug use optimization achieved by closed safety devices in hospital pharmacies, Drugs & Therapy Perspectives, 32(4):170–176
11. A.S. Wilkinson, Evaluation of the physicochemical and functional stability of Trastuzumab™ (TZM) following reconstitution and extended storage in a closed system transfer device (CSTD), TEVADAPTOR® for up to 28 days, Presentation at EAHP 2016.