

Therapeutic drug monitoring (TDM)

Quantification of drug concentrations and anti-drug antibodies



03/2023



Flexible:

ELISA's and rapid assays with ready to use reagents



Exclusive:

Validated by KU Leuven



Practical:

Validated on automated ELISA systems

More information:



https://r-b.io/TDM_EN

Therapeutic drug monitoring (TDM)

Therapeutic monoclonal antibodies

Therapeutic monoclonal antibodies are biologic agents used for the treatment of inflammatory diseases such as Crohn's disease and ulcerative colitis. **Infliximab** (IFX), **adalimumab** (ADM) and **golimumab** (GLM) belong to the group of

TNF α blockers. **Vedolizumab** (VDZ) is an α 4 β 7-integrin antagonist. **Ustekinumab** is an antibody against the cytokines interleukin-12 (IL-12) and interleukin-23 (IL-23)

How do therapeutic monoclonal antibodies work?

TNF α blockers In healthy individuals, TNF α plays an essential role in the regulation of inflammation.

In patients with Crohn's disease and ulcerative colitis, the immune cells are continuously triggered to produce TNF α , so that the inflammation does not cease and becomes chronic.

TNF α blockers bind to TNF α (see Figure 1), hereby blocking the pro-inflammatory signaling pathway that inflicts damage to the gut tissue.

As a result, gut inflammation and symptoms in patients with inflammatory bowel diseases resolve.

α 4 β 7-integrin antagonists The α 4 β 7-integrin antagonist vedolizumab is a gut-specific, humanized monoclonal antibody targeting the α 4 β 7-integrin protein. This protein is involved in the migration of lymphocytes to the gut. By binding to

the α 4 β 7-integrin the lymphocytes are prevented from migrating into the gut lumen so that they cannot exert their pro-inflammatory effect.

IL-12/IL-23 blocker Ustekinumab (UST) is a fully human monoclonal antibody that binds to the p40 subunit common to IL-12 and IL-23 thereby preventing the interaction with the cytokine receptors on T cells, natural killer cells and antigen-presenting cells. The further inflammatory reaction is stopped.

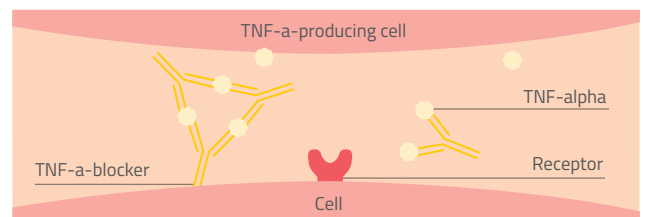


Figure 1: Example of the function of TNF α blockers. TNF α blockers scavenge TNF, which as a result, can no longer bind to the receptor. No pro-inflammatory signal is transmitted.

Individual dose adjustment by measuring drug levels and immunogenicity

In order for biological drugs to work optimally, the drug concentration needs to be sufficiently high. Therefore, regular drug concentration monitoring is advised. The trough concentration (TC) is defined as the drug concentration in the blood measured right before the next infusion. Immunogenicity may have an impact on the

efficacy of the drug. Anti-drug antibodies (ADA) may bind to the drug and lead to a decrease in drug availability and allergy-like reactions.

Monitoring of drug- and anti-drug-antibody-concentrations of biologic agents helps to optimally adjust the therapy to the individual needs of the patient.

TDM using RIDASCREEN® and RIDA®QUICK assays

Key features of R-Biopharm's TDM assays

- All TDM assays of R-Biopharm AG are validated by KU Leuven, Belgium
- ELISAs and the corresponding rapid assays correlate very well due to identical monoclonal antibodies
- RIDASCREEN® IFX Monitoring and RIDA®QUICK IFX Monitoring quantify infliximab and its biosimilars. RIDASCREEN® ADM Monitoring and RIDA®QUICK ADM Monitoring quantify adalimumab and its biosimilars
- The rapid assays RIDA®QUICK IFX Monitoring and RIDA®QUICK ADM Monitoring allow the determination of trough level concentrations of infliximab and its biosimilars and adalimumab, respectively within 20 minutes
- All ELISAs are validated on automated ELISA instruments such as DSX® and have microplates with breakable wells

Therapy adjustment based on therapeutic drug monitoring

The TAXIT-Algorithm (TAXIT = Trough Concentration Adapted Infliximab Treatment, Figure 3) is a recommendation for therapy adaptation based on the results of trough- and anti-drug-antibody-concentrations of infliximab. It is a result of the study^[1] by Niels Vande Castele et al. (KU Leuven, Belgium) which investigated the effect of drug monitoring on the outcome of TNF α -treatment.

The study shows the positive effect of TDM for **therapy optimization** and **treatment cost reduction**. Moreover, it indicates that testing for anti-drug-antibodies is useful in patients with undetectable trough concentrations of infliximab (see Figure 3). RIDASCREEN® IFX Monitoring and RIDASCREEN® Anti-IFX Antibodies are based on the assays used in this study.

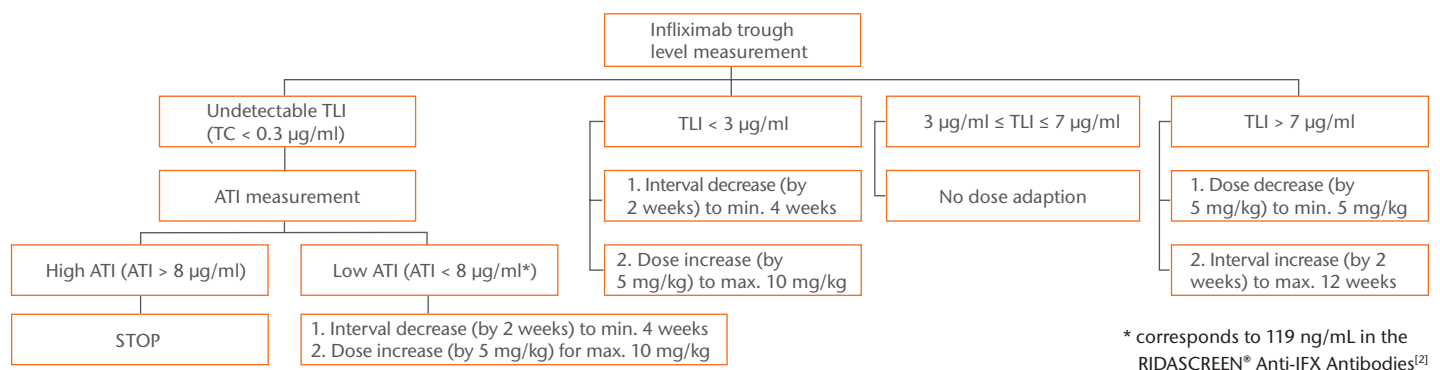


Figure 3: TAXIT-Algorithm based on TLI and ATI (Niels Vande Castele et. al. 2015)/TLI = Trough Level Infiximab, ATI = Antibodies Towards Infiximab

References:

^[1] Vande Castele N et al. Trough concentrations of infliximab guide dosing for patients with inflammatory bowel disease. *Gastroenterology* 2015;148:1320-1329.e3

^[2] Imbrechts M et al. Anti-infliximab antibodies: How to compare old and new data? *J Pharm Biomed Anal* 2020;177:112842

R-Biopharm – therapeutic drug monitoring (TDM) at a glance

Therapeutic drug monitoring (TDM)

Product	Tests	Art. No.
Enzyme immunoassays and lateral flow assay		
RIDASCREEN® IFX Monitoring	96	G09041
RIDASCREEN® Anti-IFX Antibodies	96	G09042
RIDASCREEN® ADM Monitoring	96	G09043
RIDASCREEN® Anti-ADM Antibodies	96	G09044
RIDASCREEN® VDZ-Monitoring	96	G09045
RIDASCREEN® GLM-Monitoring	96	G09047
RIDASCREEN® UST Monitoring	96	G09049
RIDA®QUICK IFX-Monitoring	25	GN3041
RIDA®QUICK ADM-Monitoring	25	GN3043

Also available:

For IBD and IBS diagnostics

Product	Tests	Art. No.
Enzyme immunoassays and lateral flow assays		
RIDASCREEN® Calprotectin	96	G09036
RIDA QUICK® Calprotectin	20	GN3037

Accessories

Product	Art. No.
Enzyme immunoassays and lateral flow assay	
RIDA®TUBE Calprotectin	GZ3016
RIDA®TUBE	GZ3013
RIDA® QUICK SCAN II - IVD SET	ZRQS2-KD-SET
RIDA®QUICK IFX Monitoring Control Set	GP3041
RIDA®QUICK ADM Monitoring Control Set	GP3043

Interactive: TDM

BRIDGEIBD interactive tool helps you to make the right treatment decision based on measured drug concentrations.

<https://www.bridgeibd.com/biologic-therapy-optimizer>



For further details and information visit our website, contact your local distributor or Clinical Sales International.

R-Biopharm contacts:

Order Department:

Phone: +49 (0) 61 51 - 81 02-0

Fax: +49 (0) 61 51 - 81 02-20

E-mail: orders@r-biopharm.de

Clinical Sales International:

Phone: +49 (0) 61 51 - 81 02-0

Fax: +49 (0) 61 51 - 81 02-688

E-mail: clinical.sales@r-biopharm.de