MAYO CLINIC LABORATORIES

Test Definition: USTEK

Ustekinumab Quantitation with Antibodies, Serum

Overview

Useful For

Evaluating patients for loss of response, partial response on initiation of therapy, autoimmune or hypersensitivity reactions, primary nonresponse, reintroduction after drug holiday, endoscopic/computed tomography enterography recurrence (in inflammatory bowel disease) and acute infusion reactions using trough level specimens

This test **does not** differentiate between the originator and biosimilar products.

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
USQN	Ustekinumab QN, S	No	Yes
USTAB	Ustekinumab Ab, S	No	Yes

Testing Algorithm

For information see Ulcerative Colitis and Crohn Disease Therapeutic Drug Monitoring Algorithm.

Special Instructions

- Ulcerative Colitis and Crohn Disease Therapeutic Drug Monitoring Algorithm

Method Name

Enzyme-Linked Immunosorbent Assay (ELISA)

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.5 mL Serum

Collection Instructions:
1. Draw blood immediately before the next dose of drug administration (trough level).
2. Centrifuge and aliquot serum into a plastic vial.

Forms

If not ordering electronically, complete, print, and send 1 of the following with the specimen:
-Gastroenterology and Hepatology Test Request (T728)
-Therapeutics Test Request (T831)

Specimen Minimum Volume

Serum: 0.35 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK
Heat-inactivated specimen	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	21 days	
	Frozen	21 days	

Clinical & Interpretive

Clinical Information

Drug and target:
Ustekinumab (UTK) is a fully human IgG1 kappa monoclonal antibody (1) that binds with high affinity to the p40 subunit of human interleukin (IL)-12 and IL-23. The drug prevents IL-12 and IL-23 bioactivity by binding and neutralizing the shared p40 subunit, preventing interaction with the cell surface receptor protein IL-12Rbeta1. Through this mechanism of action, UTK effectively neutralizes IL-12 and IL-23, proteins that are thought to be associated with gastrointestinal inflammation in Crohn disease (CD) and ulcerative colitis (UC). The reference product for ustekinumab is Stelara (Johnson & Johnson). Several biosimilars are US Food and Drug Administration (FDA)-approved for ustekinumab as of December 2025: ustekinumab-auub (Wezlana, Amgen or Yesintek, Samsung Bioepis/Organon), ustekinumab-aauz (Otulfi, Fresenius Kabi), and ustekinumab-stba (Steqeyma, Sandoz).

Indications:
Ustekinumab is FDA-approved for the treatment of patients with moderate to severe CD, moderate to severe UC, psoriatic arthritis, and plaque psoriasis. The drug is FDA-approved for pediatric patients 6 years and older for moderate

to severe plaque psoriasis and active psoriatic arthritis. Approval for pediatric CD and UC is still pending as of December 2025. Doses vary by indication. In the setting of the inflammatory bowel diseases (IBD), CD and UC, the treatment regimen is started with a single weight-based loading dose of the t-mab administered intravenously (IV), and a maintenance regimen with 90 mg standard (non-weight based) subcutaneous administration of ustekinumab 8 weeks after induction dose, and every 8 weeks thereafter.

Pharmacokinetic highlights:
Ustekinumab half-life ranges from 15 to 32 days, with a median of approximately 3 weeks, consistent with other IgG1 monoclonal antibodies. Steady state is achieved after 16 to 20 weeks of treatment. Before then, the serum concentrations of UTK may vary significantly.

Immunogenicity:
In clinical trials, 6% to 12.4% of patients using ustekinumab for psoriasis or psoriatic arthritis developed low-titer antibodies to ustekinumab (ATU).(1) For IBD, between 2.9% and 4.6% of patients developed ATU when treated with ustekinumab for 1 year.(1) In clinical practice, persistent ATU are observed in less than 2% of tested patients. Ustekinumab is associated with lower immunogenicity than anti-tissue necrosis factor inhibitors.(2) ATU may increase drug clearance in treated patients or neutralize the drug effect, thereby potentially contributing to the loss of response. ATU could also cause adverse events, such as serum sickness and hypersensitivity reactions.

Evidence for therapeutic drug monitoring:
Higher ustekinumab concentrations post-induction and during maintenance correlate with better outcomes in IBD.(2-4) At the end of induction (week 8), a threshold trough greater than 3.5 mcg/mL has been associated with clinical response. During maintenance (every-8-weeks dosing), trough concentrations targets between 3 to 7 mcg/mL are associated with clinical response and remission. These data come from post hoc analyses and cohort studies.(3-5) Ustekinumab clearance can be faster in heavier patients. There is little data supporting proactive TDM for ustekinumab, with recent reports suggesting decreased IBD-related hospitalization (6) and less disease activity (7) with higher ustekinumab concentrations. Reactive monitoring is employed when response is suboptimal.(2,3) Subtherapeutic trough concentrations are most often due to increased drug clearance related to inflammatory burden or body weight and are commonly managed by dose interval shortening rather than addition of immunomodulator therapy.

Ustekinumab quantitation is performed in conjunction with immunogenicity assessment for ATU.

Reference Values

USTEKINUMAB QUANTITATION:
Limit of quantitation is 0.3 mcg/mL

For maintenance stages:
Concentrations > or =1.0 mcg/mL are associated with clinical response and clinical remission
Concentrations > or =4.5 mcg/mL are associated with mucosal healing

USTEKINUMAB ANTIBODIES:
Limit of quantitation is 10 AU/mL
Absent: <10 AU/mL
Present: > or =10 AU/mL

Interpretation

During maintenance stages in inflammatory bowel diseases (IBD), trough ustekinumab concentrations between 3 and 7 mcg/mL are associated with clinical response and remission. Reactive monitoring is employed when response is suboptimal. Subtherapeutic trough concentrations are most often due to increased drug clearance related to inflammatory burden or body weight and are commonly managed by dose interval shortening.

Ustekinumab quantification (mcg/mL)	Antibodies to ustekinumab absent	Antibodies to ustekinumab present
<1.0	For IBD nonresponders: Insufficient ustekinumab is present. In the absence of antibodies to ustekinumab (ATU), consider optimizing therapy by shortening the administration intervals.	For IBD nonresponders: Insufficient ustekinumab is present. ATU detected can contribute to faster clearance of ustekinumab and treatment failure.
> or =1.0	For IBD nonresponders: If the sample was collected at trough ie, immediately before the next infusion, the results could suggest a mechanistic failure of ustekinumab. The provider may consider shortening administration intervals to reach desired target or switching therapeutic regimen outside of the drug class.	For IBD nonresponders: If the sample was collected at trough ie, immediately before the next infusion, the results could suggest a mechanistic failure of ustekinumab. The provider may consider closely monitoring ATU for persistence before switching therapeutic regimen outside of the drug class.

Cautions

This test measures free ustekinumab (UTK) and free antibodies to ustekinumab (ATU). This test does not measure UTK bound to ATU (immunocomplexes).

Presence of UTK at concentrations greater than 1 mcg/mL may impair detection of ATU, as the ATU assay is not drug tolerant.

Elevated rheumatoid factor (RF) may falsely increase results of ATU. During validation studies, negative ATU samples remained negative and positive ATU samples remained positive; however, the quantitative result differed by more than 20% when compared to the non-RF spiked original samples. If patients are positive for RF, clinical correlation is recommended for ATU test interpretation.

While the immunogenicity rates between reference product and biosimilars are similar, there could be epitope differences in the anti-drug-antibodies for each formulation.

These assays are designed to quantify ustekinumab and detect anti-drug antibodies specific to it, regardless of formulation. It is suitable for testing both the reference product and all US Food and Drug Administration and European Medicines Agency-approved biosimilars. The assays do not differentiate between the originator and biosimilar products.

Clinical Reference

1. Stelara (ustekinumab). Package insert: Prescribing information. Janssen Pharmaceuticals; revised 11/2025
2. Cheifetz AS, Abreu MT, Afif W, et al. A Comprehensive literature review and expert consensus statement on therapeutic drug monitoring of biologics in inflammatory bowel disease. Am J Gastroenterol. 2021;116(10):2014-2025. doi:10.14309/ajg.0000000000001396
3. Papamichael K, Cheifetz AS, Melmed GY, et al. Appropriate therapeutic drug monitoring of biologic agents for patients with inflammatory bowel diseases. Clin Gastroenterol Hepatol. 2019;17(9):1655-1668.e3
4. Restellini S, Afif W. Update on TDM (Therapeutic Drug Monitoring) with Ustekinumab, Vedolizumab and Tofacitinib in inflammatory bowel disease. J Clin Med. 2021;10(6):1242. Published 2021 Mar 17. doi:10.3390/jcm10061242
5. Irving PM, Gecse KB. Optimizing therapies using therapeutic drug monitoring: Current strategies and future perspectives. Gastroenterology. 2022;162(5):1512-1524. doi:10.1053/j.gastro.2022.02.014
6. Porth R, Deyhim T, Geeganage G, et al. Proactive therapeutic drug monitoring of Ustekinumab is sssociated with increased drug persistence in patients with inflammatory bowel disease. Inflamm Bowel Dis. 2025;31(7):1806-1810. doi:10.1093/ibd/izae231
7. Saleh A, Stading R, Miroballi N, Glassner K, Abraham BP. Therapeutic drug monitoring in patients with inflammatory bowel disease on ustekinumab. J Dig Dis. 2024;25(4):214-221. doi:10.1111/1751-2980.13264

Performance

Method Description

Testing for ustekinumab and antibodies to ustekinumab is performed using laboratory-developed immunoassays.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday, Thursday

Report Available

2 to 6 days

Specimen Retention Time

14 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

Fees & Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

80299
83520

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
USTEK	Ustekinumab QN with Antibodies, S	In Process

Result ID	Test Result Name	Result LOINC® Value
USQN	Ustekinumab QN, S	87408-1
USTAB	Ustekinumab Ab, S	87409-9