

# Tacrolimus (FK-506)

Tacrolimus, also known as FK-506 or by its trade names Prograf and Advagraf, is an immunosuppressive therapeutic drug that inhibits calcineurin, a protein phosphatase that is required for T-lymphocyte activation. Tacrolimus is frequently prescribed for use after lung, kidney, and pancreas transplants. Patients that are administered Tacrolimus therapy require routine monitoring of the blood level because of its metabolism and narrow therapeutic window. The therapeutic range for Tacrolimus is 5-15 ng/mL blood, and therapeutic drug monitoring (TDM) is an essential part of patient care. If a patient has a concentration of < 5 ng/ml, the dose may be too low to achieve the appropriate immunosuppression; if a patient has a concentration > 15 ng/ml, unwanted side-effects and toxicity may occur. Care should be taken to document the date, time, and amount of last Tacrolimus dose, as this information is vitally important in the interpretation of Tacrolimus TDM data. In addition to TDM, Tacrolimus concentrations can also be evaluated in Pharmacokinetic (PK) studies. High resolution accurate mass LC-MS system delivers reliable Tacrolimus concentrations, offering far greater specificity and sensitivity than immunoassays. For more information, call the lab at 513-636-4203.

## Sample Type:

Dried blood spots

## Volume:

3 full blood spots.

Minimum volume is one full spot on Whatman 903 filter paper.

## Specimen Preparation:

Collect 3 blood spots on 10 mm premarked circles on the Whatman 903TM Protein Saver Card; allow blood to dry for a minimum of 3 hours. Or, if VAMS device is used, collect blood on 2 VAMS tips; allow blood to dry for a minimum of 3 hours.

## Unacceptable Specimens:

Samples that are transported before blood is completely dry or water on blood spots.

## Stability:

**Ambient:** 7 days

**Frozen:** 14 days

## Methodology:

High resolution accurate mass liquid chromatography-mass spectrometry (LC-MS)

## Reporting Units:

Quantitative: ng/mL

## LC-MS/MS Calibration Range:

1 – 50 ng/mL

## Therapeutic Range:

5 – 15 ng/mL

## Shipping Conditions:

Dried blood cards in sealed plastic bag, same or next day speed.

## Testing Schedule:

Mon & Thur, 1st Shift (for testing outside this schedule, please call 513-636-4203). **Turnaround time:** 2-8 days.

## CPT Code:

80197

## Contact Information:

Clinical Mass Spectrometry

Tel: 513-636-4203

Fax: 513-803-5014

Email: [pathology@cchmc.org](mailto:pathology@cchmc.org)

Website: <https://www.cincinnatichildrens.org/mass-spec>

## Shipping Address:

Clinical Mass Spectrometry Facility, MLC 7019

Department of Pathology and Laboratory Medicine

Cincinnati Children's Hospital Medical Center

240 Albert Sabin Way

Cincinnati, Ohio 45229-3039

## References:

1. Derick A. Kalt, Tacrolimus: A Review of Laboratory Detection Methods and Indications for Use. *Lab Medicine* 2017 (48) e62–e65.
2. Shokati T, et al. Quantification of the Immunosuppressant Tacrolimus on Dried Blood Spots Using LC-MS/MS. *J Vis Exp.* 2015 (105) e52424.
3. Veenhof H, et al. Clinical validation of simultaneous analysis of tacrolimus, cyclosporine A and creatinine in dried blood spots in kidney transplant patients. *Transplantation.* 2017 (101) 1727–1733.