Clinical Pharmacokinetics Research Laboratory

College of Pharmacy
University of Rhode Island

The Clinical Pharmacokinetics Research Laboratory is a growing analytical lab specializing in pharmacokinetics, pharmacodynamics and therapeutic drug monitoring of immunosuppressive agents. Located at the Kingston Campus of the University of Rhode Island, the lab is equipped with High Performance Liquid Chromatography (HPLC) and Liquid Chromatography coupled with Tandem Mass Spectrometry (LC-MS/MS). We have established and validated analytical methods for determination of a wide range of immunosuppressive agents including cyclosporine, tacrolimus and mycophenolic acid. In addition we specialize in the measurement of free or pharmacologically active concentration of immunosuppressive agents. Recently we have developed two novel methods for determination of cyclosporine and Mycophenolic acid in saliva using LC-MS/MS. In addition we have validated methods for determination of iohexol and acetaminophen in plasma using HPLC. We also can help you in study design and data analysis for pharmacokinetic studies.

A list of available services includes:

Total cyclosporine concentration (LC-MS/MS)
Free cyclosporine concentration (equilibrium dialysis)
Salivary concentration of cyclosporine (LC-MS/MS)
Total tacrolimus concentration (LC-MS/MS)
Free tacrolimus concentration (equilibrium dialysis)
Total mycophenolic acid (MPA) concentration (HPLC)
Total concentration of mycophenolic acid glucoronide (MPAG) and Acyl MPAG (HPLC)
Free MPA concentration (ultrafiltratioon followed by LC-MS/MS)
Iohexol concentration for determination of Glomerular Filtration Rate (HPLC)
Acetaminophen concentration for determination of gastric emptying time (HPLC)
Measurement of Inosine 5'-Monophosphate Dehydrogenase Type–II (IMPDH-II) Activity in Peripheral Blood Mononuclear cells (HPLC)
Measurement of Intracellular cytokine production in T-lymphocytes (Flow Cytometer)
Design of protocols for pharmacokinetic studies
Analysis of data from conventional pharmacokinetic studies (WINNONLIN software)
Analysis of population pharmacokinetics data (NONMEM software)

Selected publications:

S.E. Rosenbaum, G. Baheti, A.K. Trull, F. Akhlaghi, Population pharmacokinetics of cyclosporine in cardiopulmonary transplant recipients, Ther Drug Monit 2005;27:116–122.

R.S. Soman, H. Zahir, F. Akhlaghi, Development and validation of an HPLC-UV method for determination of iohexol in human plasma, J Chromatogr B Analyt Technol Biomed Life Sci. 2005 Feb 25;816(1-2):339-43.

C.G. Patel, A.E. Mendonza, O. Majid, A.K. Trull, T. Lee, D.W. Holt, F. Akhlaghi; Determination of Total Mycophenolic Acid and its Glucuronide Metabolite using Liquid Chromatography with Ultraviolet Detection and Unbound Mycophenolic Acid Using Tandem Mass Spectrometry, J Chromatogr B Analyt Technol Biomed Life Sci. 2004 Dec 25;813(1-2):287-94.

A. E. Mendonza, R.Y. Gohh, F. Akhlaghi, Determination of Cyclosporine in Saliva using Liquid Chromatography-Tandem Mass Spectrometry, Therapeutic Drug Monitoring. 26(5):569-575, October 2004.

A.K. Trull, F. Akhlaghi, S.C. Charman, S. Endenberg, O. Majid, J. Cornelissen, L. Steel, J. Parameshwar, J. Wallwork, S. Large. Immunosuppression, eotaxin and the diagnostic changes in eosinophils that precede early acute heart allograft rejection. Transplant Immunology 2004; 2:159-66

F. Akhlaghi, A.K. Trull. Distribution of cyclosporin in organ transplant recipients. Clinical Pharmacokinetics 2002; 41:615-637.

F. Akhlaghi, C.H. Jackson, J. Parameshwar, L.D. Sharples, A.K. Trull. Risk factors for the development and progression of dyslipidemia after heart transplantation. Transplantation 2002; 73(8): 1258-1264.

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