## IJARSCT



International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)

International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal

Volume 3, Issue 1, June 2023

# A Detailed Examination and Evaluation of the Applicability of Bioanalytical Methods

Ashish Kumar<sup>1</sup> and Dr. Dhirendra Babji Sanghai<sup>2</sup>

Research Scholar, Department of Pharmacy<sup>1</sup> Associate Professor, Department of Pharmacy<sup>2</sup> Sunrise University, Alwar, Rajasthan, India

**Abstract:** For the analytical and bio-analytical procedures to be reliable and high-quality method development processes, validation is a must. Developing bio-analytical methods is crucial to getting marketing approval for medications at all phases of the development process. The processes required in validating the best pharmacokinetic, toxic kinetic, bioavailability, and bioequivalence investigations will be reviewed in this study. Additionally, it will provide a practical approach to determine the different metrics, including range, accuracy, precision, ruggedness, robustness, recovery, and linearity. The goal of bioanalysis research is to quantitatively identify drugs and their metabolites in bodily fluids. The effectiveness of drugs and their metabolites in preclinical, biopharmaceutical, and clinical pharmacology is dependent on accurate and reliable methods for quantitative evaluation.

Keywords: Robustness, Sensitivity, Linearity, Method development

### REFERENCES

- [1]. Thompson M, Ellison SLR, Wood R. Harmonized Guidelines for Single Laboratory Validation of Method of Analysis. Pure Appl Chem. 2008; 74: 835–855.
- [2]. Wood R. How to Validate Analytical Methods. Trends Analyt Chem. 2005; 18: 624–632.
- [3]. McDowall RD. The Role of Laboratory Information Management Systems LIMS in Analytical Method Validation. Anal. Chim. Acta. 2007; 54: 149–158.
- [4]. Vander Heyden Y, Nijhuis A, Smeyers-Verbeke J, Vandeginste BG, Massart DL. Guidance for robustness/ruggedness tests in method validation. J Pharm Biomed Anal. 2001; 24: 723-753.
- [5]. Puluido A, Ruusanches I, Boque R, Rius FX. Uncertainty of results in routine Qualitative Analysis in Analytical Chemistry. J Pharm Biomed Anal. 2005; 22: 647–654.
- [6]. Jhang JS, Chang CC, Fink DJ, Kroll MH. Evaluation of linearity in the clinical laboratory. Arch Pathol Lab Med. 2004; 128: 44-48.
- [7]. Mark H. Application of an improved procedure for testing the linearity of analytical methods to pharmaceutical analysis. J Pharm Biomed Anal. 2003; 33: 7-20.
- [8]. Trullols E, Ruisanchez I, Rius FX. Trends in Analytical Chemistry. J Lab Invest. 2003; 23: 137-145.
- [9]. Valcarcel M, Cardenas S, Gallego M. Sample screening system in analytical chemistry. Trends Analyt Chem. 1999; 18: 685-694.
- [10]. Ye C, Liu J, Ren F, Okafo N. Design of experiment and data analysis by JMP (SAS institute) in analytical method validation. J Pharm Biomed Anal. 2000; 23: 581-589.
- [11]. Lindner W, Wainer IW. Requirements for initial assay validation and publication in J. Chromatography B. J Chromatogr B Biomed Sci Appl. 1998; 707: 1-2.
- [12]. Shah VP, Midha KK, Dighe S, McGilveray IJ, Skelly JP, Yacobi A, et al. Analytical methods validation: bioavailability, bioequivalence and pharmacokinetic studies. Conference report. Pharm Res. 2009; 9: 588– 592.
- [13]. Penninckx W, Hartmann C, Massart DL, Smeyers-Verbeke J. Validation of the Calibration Procedure in Atomic Absorption Spectrometric Methods. J Anal At Spectrom. 1998; 11: 237–246.

Copyright to IJARSCT www.ijarsct.co.in DOI: 10.48175/568



724

## **IJARSCT**



International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)

International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal

#### Volume 3, Issue 1, June 2023

- [14]. Nowatzke W, Woolf E. Best Practices during Bioanalytical Method Validation for the Characterization of Assay Reagents and the Evaluation of Analyte Stability in Assay Standards, Quality Controls, and Study Samples. AAPS J. 2007; 9: E117–122.
- [15]. Braggio S, Barnaby RJ, Grossi P, Cugola M. A strategy for validation of bioanalytical methods. J Pharm Biomed Anal. 1996; 14: 375-388.
- [16]. James CA, Breda M, Frigerio E. Bioanalytical method validation: a risk-based approach? J Pharm Biomed Anal. 2004; 35: 887-893.
- [17]. Nakashima K. High-Performance Liquid Chromatography of drug of abuse in biological samples. J Health Sci. 2009; 51: 272–277.
- [18]. Boulanger B, Chiap P, Dewe W, Crommen J, Hubert P. An analysis of the SFSTP guide on validation of chromatographic bioanalytical methods: progress and limitations. J Pharm Biomed Anal. 2003; 32: 753-765.
- [19]. Causon R. Validation of chromatographic methods in biomedical analysis. Viewpoint and discussion. J Chromatogr B Biomed Sci Appl. 1997; 689: 175-180.
- [20]. Hartmann C, Smeyers-Verbeke J, Massart DL, McDowall RD. Validation of bioanalytical chromatographic methods. J Pharm Biomed Anal. 1998; 17: 193-218.
- [21]. Hubert P, Chiap P, Crommena J, Boulanger B, Chapuzet EN, Laurentie M, et al. The SFSTP guide on the validation of chromatographic methods for drug bioanalysis: from the Washington Conference to the laboratory. Anal Chim Acta. 1999; 391: 135–148.
- [22]. Zhoua S, Songb Q, Tangb Y, Weng N. Critical Review of Development, Validation, and Transfer for High Throughput Bioanalytical LC-MS/MS Methods. Curr Pharm Anal. 2005; 55: 3–14.
- [23]. Tabrizi-Fard MA, Fung HL. Reversed-phase high-performance liquid chromatography method for the analysis of nitro-arginine in rat plasma and urine. J Chromatogr B Biomed Appl. 1996; 679: 7-12.
- [24]. Dadgar D, Burnett PE. Issues in evaluation of bioanalytical method selectivity and drug stability. J Pharm Biomed Anal. 1995; 14: 23-31.
- [25]. Hartmann C, Massart DL, McDowall RD. An analysis of the Washington Conference Report on bioanalytical method validation. J Pharm Biomed Anal. 1994; 12: 1337-1343.
- [26]. Wieling J, Hendriks G, Tamminga WJ, Hempenius J, Mensink CK, Oosterhuis B, et al. Rational experimental design for bioanalytical methods validation. Illustration using an assay method for total captopril in plasma. J Chromatogr. 2006; 730: 381–394.
- [27]. Hubert H, Chiap P, Crommen J, Boulanger B, Chapuzet E, Mercier N, et al. The SFSTP guide on the validation of chromatographic methods for drug analysis: from the Washington Conference to the laboratory. Anal Chim Acta. 1999; 391: 45–55.
- [28]. Miller KJ, Bowsher RR, Celniker A, Gibbons J, Gupta S, Lee JW, et al. Workshop on bioanalytical methods validation for macromolecules: summary report. Pharm Res. 2001; 18: 1373-1383.
- [29]. Kringle R, Hoffman D. Stability methods for assessing stability of compounds in whole blood for clinical bioanalysis. Drug Info J. 2001; 35: 1261–1270.
- [30]. Dighe S, Shah VP, Midha KK, McGilveray IJ, Skelly JP, Yacobi A, et al. Analytical methods validation: bioavailability, bioequivalence and pharmacokinetics studies. Conference Report. Eur J Drug Metabol Pharmacokinetics. 1998; 16: 249–255

