CHAPTER 20. QUALITY ASSURANCE PROGRAM TO ENSURE CORRECT PERFORMANCE OF THE FLOW (ICN) TITERTEK MULTISKAN MC PLATE READER

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20.1 Introduction

Due to the increased use of enzyme immunoassay procedures for the analysis of important residues, it is important to assure that the instrument used to measure the data produced in these assays is operating properly. This is especially important with regard to assays that have defined optical density values for positive, negative, and control parameters. Many of the current enzyme immunoassays implemented in the Field Service Laboratories employ the ABTS/H_2O_2 substrate and the Flow (ICN) Multiskan MC Plate Reader to obtain data. This substrate when acted upon by the enzyme peroxidase produces a product which has a maximum absorbance at the 414 nm wavelength (filter #2). There is no way to be certain that the daily optical density readings obtained by the instrument during the performance of an enzyme immunoassay are correct, except perhaps by complacent trust. The easy procedure described in this chapter is an attempt to ensure that the readings generated by the Flow (ICN) Multiskan MC Reader at the 414 nm wavelength filter (#2) are indeed correct and that the instrument is operating properly.

20.2 Procedure

a. Prepare 200 ml of a stock 15% (w/v) solution of nickel sulfate (nickelous sulfate, 6-hydrate, crystal, Baker 2808-1) in distilled water in a volumetric flask. Store this stock solution in an air-tight glass container to prevent evaporation and ensure that deterioration does not occur due to contamination or chemical decomposition.

b. Obtain a Dynatech Immulon I, 96 well microtiter plate.

c. Leave all wells of column 1 empty. Accurately place 200 µl of the stock 15% nickel sulfate solution into all wells of columns 2 and 3 (16 wells total).

d. Turn on the Flow (ICN) reader, allow it to warm up and program it for Mode 1 (singe absorbance) and Filter #2 (414 nm wavelength).

e. Push the plate containing the nickel sulfate wells into the reader, blank the instrument on column 1 and obtain optical density readings for the wells of columns 2 and 3.

f. Calculate the mean O.D. value for the 16 wells of columns 2 and 3.

g. Perform the exact same procedure each month and keep a log book of the monthly mean O.D. values for the 16 nickel sulfate wells.

h. If the instrument is performing correctly there should be no significant change in the monthly mean O.D. values. A significant change (most likely a decrease) in these values indicates a problem with the instrument, probably with regard to the light source (lamp), the 414 nm wavelength filter (#2), or the internal electronics of the instrument itself. A systematic check out of these areas in that order is recommended.

NOTE: Spare lamps, replacement filters, electronic repair/instrument check out, or technical assistance may be obtained from:

ICN Biomedical Instruments
330 Wynn Drive
Huntsville, Alabama 35805
Tele: 1-800-426-8869

Prior to returning the instrument for repair, you must first obtain a Return Goods Authorization (RGA) number by calling the above and making the necessary arrangements.