

Evaluation of a new point-of-care immunoassay using surface plasmon enhanced fluorescence method (FUJI DRI-CHEM IMMUNO AU10V) for the measurement of feline total thyroxine

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INTRODUCTION

Hyperthyroidism is the most frequent endocrinopathy in cats and its routine screening is recommended for senior and geriatric cats. Immunoassays that are rapid, cheap and reliable are therefore needed.

The aim of this study was to evaluate a new point-of-care using a new technology called Surface Plasmon enhanced Fluorescence method (SPF) for the measurement of total thyroxine (tT4) in feline samples (FUJI DRI-CHEM IMMUNO AU10V, FUJIFILM, Figure 1).

SPF detects fluorescence and measures the quantity of substances by intensely exciting, with the near-field light generated surface plasmon resonance (SPR), fluorescent substances that exist near the metal surface (Figure 2b).

MATERIALS AND METHODS

- 46 feline serum and plasma samples
- Tested Point-of-care : FUJI DRI-CHEM (FDC) Immuno AU10V, FUJIFILM (Surface Plasmon Enhanced Fluorescence method (SPF))
- Gold Standard Automat : Immulite 2000, Siemens (Chemiluminescence enzyme immunoassay, CLEIA)
- Statistical Analysis : Bland & Altman, Passing & Bablok (XLStat)



Figure 1 :FUJI DRI-CHEM IMMUNO AU10V analyzer and v-T4 reagent

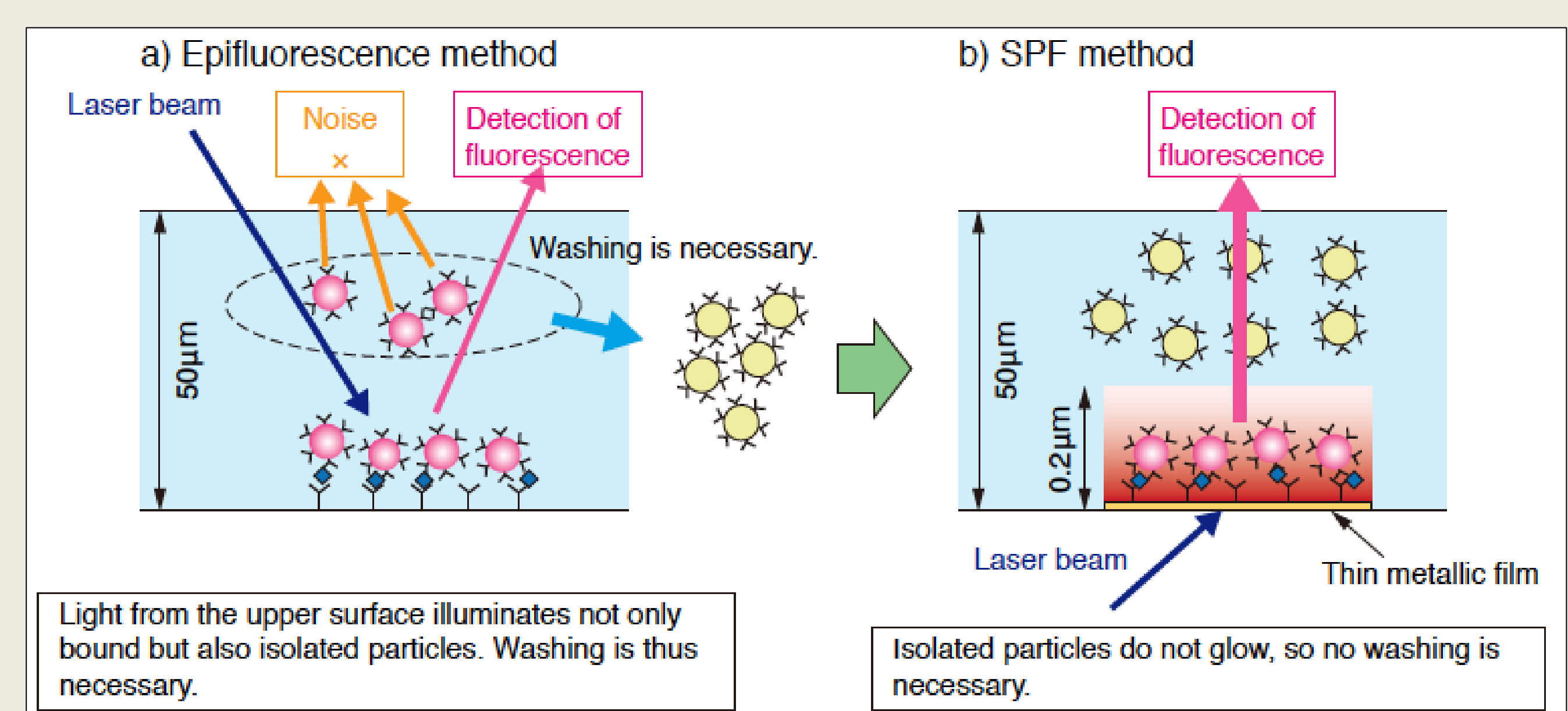


Figure 2 : Schematic drawings of a) epifluorescence method (conventional) and b)SPF method.

RESULTS

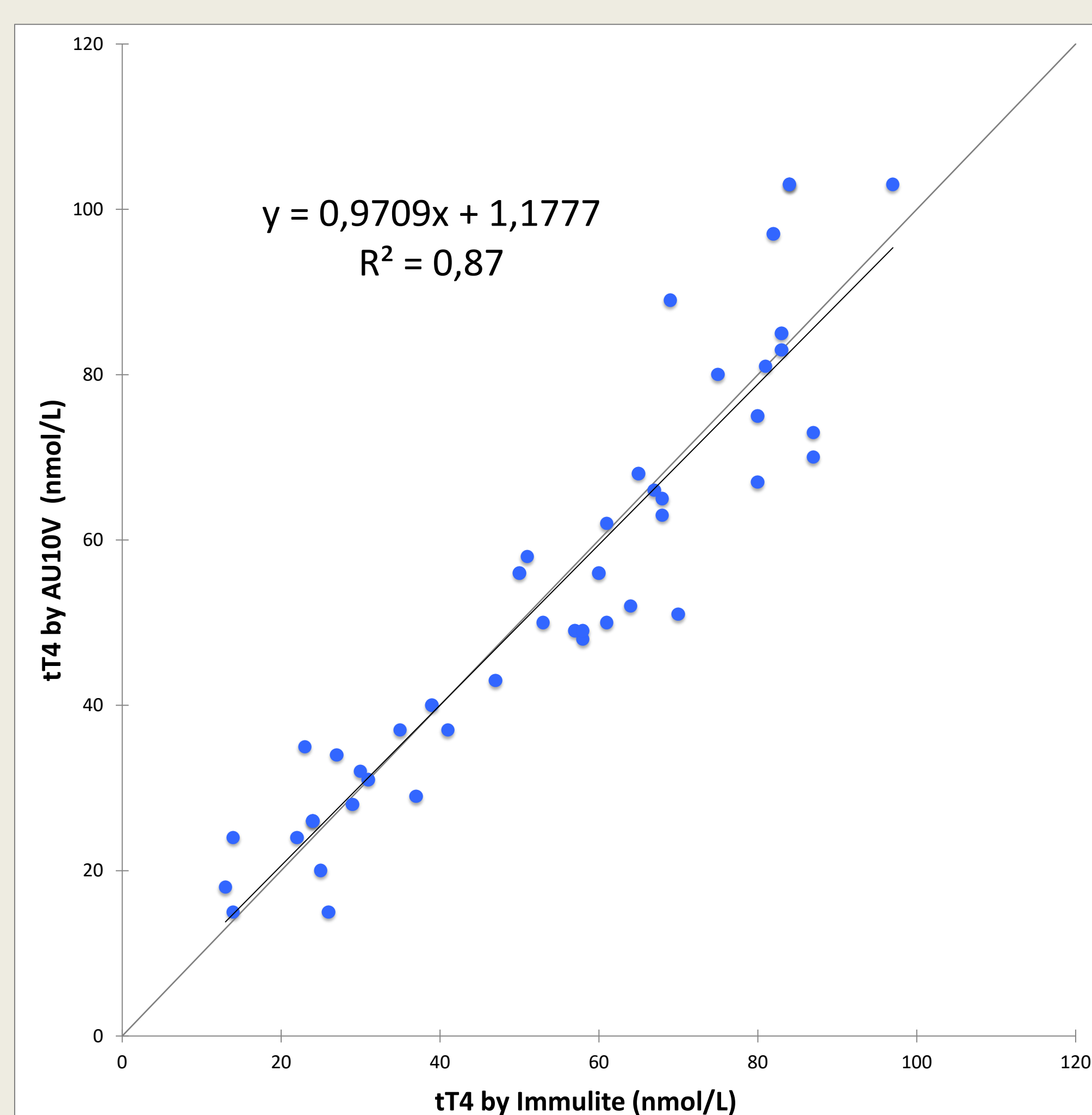


Figure 3 : Correlation of FDC Immuno AU10V and Immulite (CLEIA)

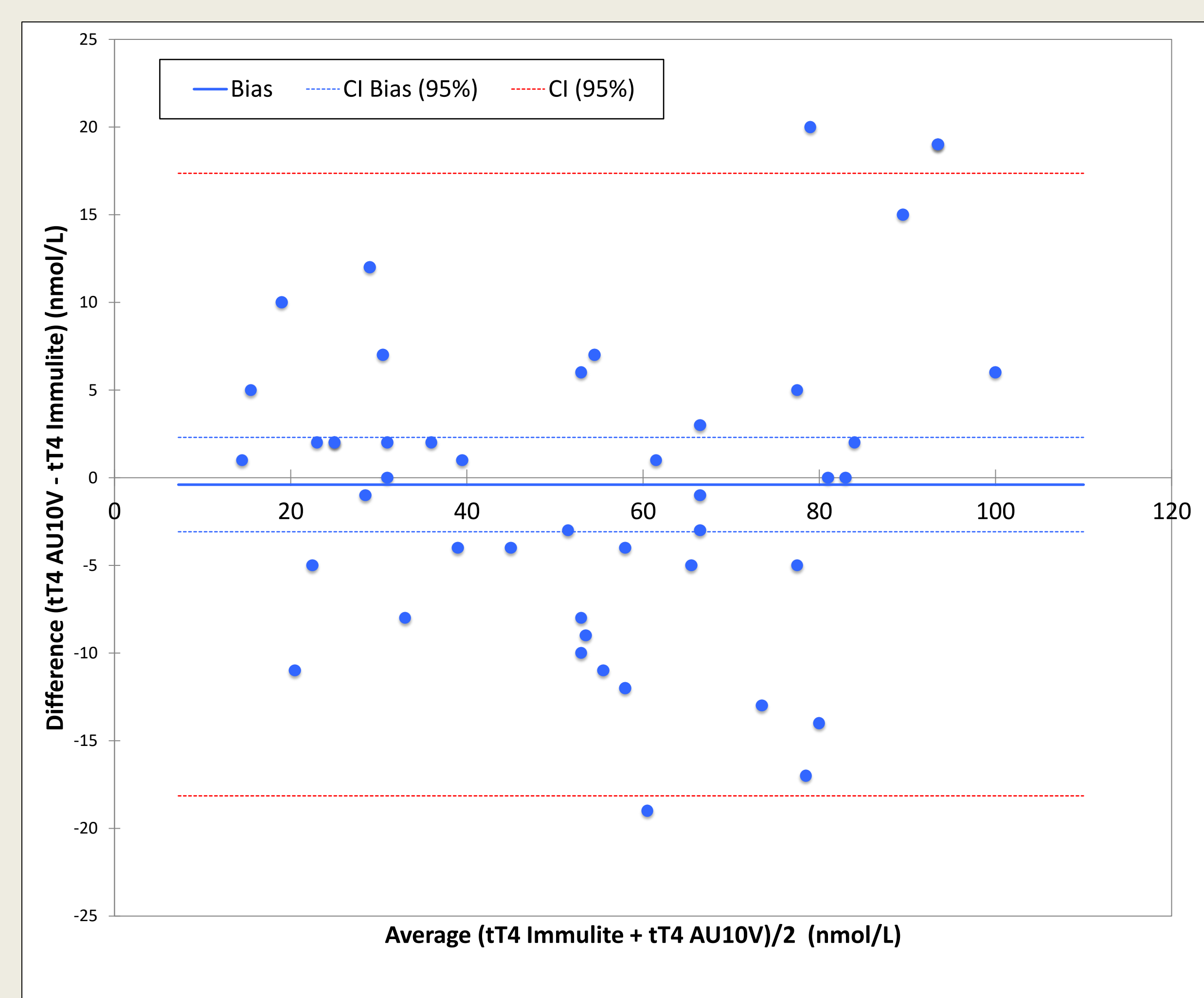


Figure 4 : Bland and Altman plot

- The FDC Immuno AU10V shows good correlation with Immulite, $r^2 = 0.87$ as shown in Figure 3.
- Bland and Altman analysis (Figure 4) : Negative Bias (Mean = -0,4 nmol/L ; 95%CI : -3,1 to 2,3 nmol/L)
- Passing and Bablok analysis : Linear relationship ($p=0,43$) with intercept of 0,0 (95% CI : -5,5 to +7,0) and slope coefficient value of 1,0 (95% CI : -0,9 to +1,1)

CONCLUSION

The new point-of-care immunoassay, FUJI DRI-CHEM IMMUNO AU10V, had an excellent correlation with the CLEIA for tT4 in feline samples.