Comparison of two new HTLV-I/II screening methods, Abbott Alinity i rHTLV-I/II and Diasorin LIAISON® XL murex recHTLV-I/II, to Abbott Architect rHTLVI/II assay

Vincent Guiraud, Florian Crémoux, Isabelle Leroy, Julien Cohier, Pierre Hernandez, Safietou Mansaly, Agnès Gautheret-Dejean

HAL Id: hal-04086828

https://hal.sorbonne-universite.fr/hal-04086828v1

Submitted on 17 May 2023

1 **Comparison of two new HTLV-I/II screening methods, Abbott Alinity I rHTLV-I/II and**

2 **Diasorin LIAISON® XL murex recHTLV-I/II, to Abbott architect rHTLVI/II assay**

3

4 Vincent Guiraud[a,&], Florian Crémoux[a,&], Isabelle Leroy[a], Julien Cohier[a], Pierre Hernandez[a],

5 Safietou Mansaly[a], Agnès Gautheret-Dejean[a,b,*]

6 [a] *AP-HP, Hôpitaux Universitaires La Pitié Salpêtrière-Charles Foix, Service de Virologie, F-*

7 *75013 Paris, France*

8 [b] *Université Paris cité, INSERM UMR-S 1139 Physiopathologie et pharmacotoxicologie*

9 *placentaire humaine : microbiote pré & post-natal, F-75006 Paris, France*

10

11 [&] *These authors also contributed equally to this work.*

12 * Corresponding author: Hôpital Universitaire La Pitié Salpêtrière, Service de Virologie, 83

13 Bd de l'Hôpital, 75013 Paris, France. Tel: +33 1 42177401 / Fax: +33 1 42177411. E-Mail:

14 agnes.gautheret@aphp.fr

15

16 **ABSTRACT**

17 *Background:* Diagnosis of Human T-cell Lymphotropic Virus (HTLV) types I and II infection

18 requires sequencial testing with firstly a screening using an Enzyme immunoassay followed

19 by a confirmatory test.

20 *Objectives:* To compare the performances of the Alinity i rHTLV-I/II (Abbott®) and

21 LIAISON® XL murex recHTLV-I/II serological screening tests to the ARCHITECT

22 rHTLVI/II test followed if positive by HTLV BLOT 2.4, MP Diagnostics as the reference.

23 *Study design:* 119 serum samples from 92 known HTLV-I infected patients and 184 from

24 uninfected patients with HTLV were analyzed in parallel with, Alinity i rHTLV-I/II,

25 LIAISON® XL murex recHTLV-I/II and ARCHITECT rHTLVI/II.

26 *Results:* Alinity i rHTLV-I/II and Liaison XL murex recHTLV-I/II exhibited a total

27 agreement with ARCHITECT rHTLVI/II for both positive and negative samples. Both tests

28 are suitable alternatives for HTLV screening.

29

30 *Keywords:*

31 Human T-cell lymphotropic virus, serological assay, method comparison, ARCHITECT

32 rHTLVI/II, Alinity i rHTLV-I/II, LIAISON$^®$ XL murex recHTLV-I/II

33

34

35

36

37

38   Abbreviations:

39   HTLV: Human T-cell Lymphotropic Virus, 95% CI: 95% Confidence interval, ATLL: adult

40   T-cell leukemia/lymphoma, HAM: HTLV-associated myelopathy, CMIA: chemiluminescent

41   microparticle immunoassay, CLIA: chemiluminescent immunoassay, RLU: Relative Light

42   Unit, S/CO: signal/cutoff, CV: coefficient of variation, SD: standard deviations.

43

1. Background

Human T lymphotropic virus type I (HTLV-I) and Human T lymphotropic virus type II (HTLV-II) were the first retroviruses discovered, respectively in 1980 [1] and 1982 [2]. They are responsible for adult T-cell leukemia/lymphoma (ATLL) [3], HTLV-associated myelopathy (HAM) [4] and inflammatory diseases such as uveitis, myositis and dermatitis [4]. HTLV in adult population is unevenly distributed worldwide: highly endemic in Japan, Caraibeans and several African areas while virtually absent in other regions [5,6]. However, in both low and high endemic countries prevalence may exhibit discrepancies. For instance areas in Texas or Nevada has seroprevalence more than ten times higher than other parts of the United States [7]. HTLV transmission occurs in utero, peripartum mostly through breastfeeding [8], during sexual relationship [9], intravenous drug use [10], and solid organ or hematopoietic transplantation [11]. Finally, although blood transfusion has been an historical route of HTLV transmission, leukofiltration has significantly reduced this risk [12].

To limit blood and graft-born transmission, 35 countries to date test each donor for HTLV serology, and 15 more implement selective testing according to specific risk factors [13]. Since serological screening is both the most sensitive [14] and cost-effective way to screen [15] but lack specificity, guidelines recommend a dual-testing algorithm with firstly a third-generation screening using chemiluminescent immunoassay or enzyme-linked immunosorbent assay. In case of reactive or indeterminate result, a specific confirmatory assay with an Immunoblot, Western blot or line immunoassay [16,17], is performed.

2. Objectives

The objective of this study was to compare two screening immunoassays, Alinity i rHTLV-I/II (Abbott®, Rungis, France), LIAISON® XL murex recHTLV-I/II (DiaSorin, Antony, France), with ARCHITECT rHTLV-I/II (Abbott, Rungis, France) followed for positive

68   samples by HTLV BLOT 2.4 (MP Diagnostics™, Illkirch-Graffenstaden, France) as the

69   reference.

70   **3. Study design**

71   *3.1 Samples*

72   The study included a retrospective part of clinical and analytical sensitivity, and an

73   exploratory prospective part of specificity. All serum samples had been tested following the

74   routine algorithm of the Service of Virology at the Pitié Salpêtrière Hospital (Paris, France).

75   Architect rHTLV-I/II was used as the screening method with HTLV BLOT 2.4 as the

76   confirmatory assay for reactive results. Only samples confirmed HTLV positive were

77   included in the retrospective study. For clinical sensitivity, 119 serum samples from 92

78   HTLV-I subjects were included. Serum samples were stored at -20°C before use. Analytical

79   sensitivity was done using dilutions of positive serum samples from two HTLV-I infected

80   patients. For the exploratory specificity prospective study, 184 fresh non-reactive serum

81   samples using Architect rHTLV-I/II were included from January 4th 2022 to March 1st 2023.

82   They were stored at +4°C before use. Reproducibility and repeatability were assessed with

83   positive and negative controls of the kits.

84   *3.2 Methods and analysis*

85   For clinical sensitivity, all samples were tested the same day according to the manufacturer's

86   instructions with the three methods: Architect rHTLV-I/II, Alinity i rHTLV-I/II and

87   LIAISON® XL murex recHTLV-I/II. Architect rHTLV-I/II and Alinity i rHTLV-I/II are

88   based on chemiluminescent microparticle immunoassay (CMIA) and LIAISON® XL murex

89   recHTLV-I/II is based on chemiluminescent immunoassay (CLIA). All methods use HTLV-

90   I/II gp46 synthetic peptides and HTLV-I p21 recombinant protein. In addition, LIAISON®

91   XL murex recHTLV-I/II contains HTLV-II p21 recombinant protein. Results for all three

methods were expressed as the ratio of the Relative Light Unit (RLU) of the sample (signal) to the RLU of the cutoff (S/CO). A reactive result was defined as a ratio ≥ 1 and a non-reactive result was defined as a ratio <1. Of note, none of the three assays allocated undetermined results.

To evaluate repeatability, positive and negative controls were tested 23 times in the same run following previous guidelines [18]. Reproducibility was assessed by testing positive and negative controls of the kit once a run for 30 consecutive days. Repeatability and reproducibility were evaluated by analyzing coefficients of variation (CV), defined as the ratio of standard deviation of the S/CO value to the mean S/CO value.

Dilution for analytical sensitivity analyses were: 1:10, 1:100, 1:200, 1:500, 1:1000, 1:10000. The three methods were performed in parallel.

For the prospective exploratory specificity study, 184 non-reactive samples using Architect rHTLV-I/II were tested with LIAISON® XL murex recHTLV-I/II and Alinity i rHTLV-I/II in parallel the same day.

3.3 Statistical analysis

Statistical analyses were conducted using R version 4.2.1 [19]. S/CO values were compared using Spearman correlation coefficient (r) and Wilcoxon's test for paired data. All reported P values are two-sided, with $p < 0.05$ considered statistically significant. Delta (δ) value was used to estimate the methods' abilities to separate reactive and non-reactive populations from the cut off [20–22]. Delta value was defined for both reactive and non-reactive population as the distance between the population mean and the CO, expressed in standard deviation (SD) units of the log transformed population distribution according to the following formula:

6

116 $$Delta\ (\delta\ ) = \frac{Population\ mean\ (\log(S/CO))}{SD\ (\log(S/CO))}$$

117 **4. Results**

118   With ARCHITECT rHTLVI/II followed for reactive sera by HTLV BLOT 2.4, MP

119 Diagnostics as the reference assay, Alinity i rHTLV-I/II and LIAISON® XL murex recHTLV-

120 I/II identified correctly all 119 positive samples leading to a sensitivity of 100% with a 95%

121 CI [97%-100%]. All S/CO ranges were similar for the three methods, but Alinity i rHTLV-I/II

122 had a mean S/CO value lower in comparison with Architect (p = 7.5E-16) and Liaison (p =

123 1.2E-11) (Table 1). Mean S/CO value for reactive samples was higher for Liaison murex

124 recHTLV-I/II than Architect rHTLV-I/II (p = 0.045). For 92 serum samples, S/CO values

125 were lower using Alinity i rHTLV-I/II in comparison with the other two methods. Reactive

126 S/CO values were well correlated between ARCHITECT rHTLV-I/II and Alinity i rHTLV-

127 I/II (R^2 = 0.53, p < 2.2E-16), but less correlated between ARCHITECT rHTLV-I/II and

128 Liaison XL (R^2 = 0.26, p = 6.5E-9) or Alinity i rHTLV-I/II and LIAISON® XL murex

129 recHTLV-I/II (R^2 = 0.22, p = 9.9E-8) (Fig. 1). A phenomenon of saturation was observed for

130 LIAISON® XL murex recHTLV-I/II for S/CO values above 130 when Architect rHTLV-I/II

131 positivity was over 75 IU (Fig. 1).

132   Results of sensitivity for endpoint dilutions were similar for the three methods, with a

133 negativation around 1:10000 for patient 1, and around 1:200 for patient 2 (reported in

134 Supplemental Table 1).

135   Results of reproducibility were similar for all three methods, with CV for positive control

136 ranging from 4.7% (95% CI [3.7%-6.4%]) for Alinity i rHTLV-I/II to 9.6% (95% CI [7.7%-

137 13.1%]) for LIAISON® XL murex recHTLV-I/II Assays, and for negative control ranging

138 from 5.7% (95% CI [4.7-7.7]) to 20.1% (95% CI [16.0-27.2]) (reported in Supplemental

139 Table 2). Results of repeatability were also similar for all three methods, with CV for positive

140 control ranging from 1.3% (95% CI [1.0-1.7]) for Alinity i rHTLV-I/II to 3.7% (95% CI [3.0-

141 5.1]) for ARCHITECT rHTLV-I/II. For negative controls, CV ranged from 5.7% (95% CI

142 [4.5-7.7]) for LIAISON® XL murex recHTLV-I/II to 10.7% (95% CI [8.3-15.1]) for Alinity i

143 rHTLV-I/II. None of the positive and negative controls tested was misclassified.

144 Of note, for the exploratory study of specificity, with ARCHITECT rHTLV-I/II as the

145 reference assay, Alinity i rHTLV-I/II and LIAISON® XL murex recHTLV-I/II identified

146 correctly the 184 negative serum samples.

147 The ability for each test to allow a high discrimination between reactive and non-reactive

148 populations was assessed by the δ coefficient with the higher absolute value the better

149 discrimination. Interestingly, compared with ARCHITECT rHTLV-I/II (-4.8 for non-reactive

150 and 8.8 for reactive), Alinity i rHTLV-I/II seemed to be less discriminant assay (-9.1 for non-

151 reactive and 7.9 for reactive) for reactive samples, while LIAISON® XL murex recHTLV-I/II

152 might be the most discriminant (-9.5 for non-reactive and +13.9 for reactive) (Fig. 2).

153

154 **5. Discussion**

155 All 119 samples from HTLV-I-infected patients were tested positive with the two studied

156 methods, although S/CO values were moderately correlated. A phenomenon of saturation of

157 the signal was observed with LIAISON® XL murex recHTLV-I/II above 130 S/CO, and

158 positive ratios were lower using Alinity i rHTLV-I/II. Of note, all 184 uninfected patients

159 were non-reactive with the two methods. Positive and negative results were highly

160 discriminated, especially for LIAISON® XL murex recHTLV-I/II with a δ coefficient at -9.5

161 for non-reactive and +13.9 for reactive samples.

162 This study is in agreement with the study of Malm et al. where 38 positive samples were

163 tested with ARCHITECT rHTLV-I/II and Murex recHTLV-I/II EIA method in a microplate

164 formate used as the reference method [23]. Similar results were obtained by Qiu et al. on 498

8

165 samples from patients infected by HTLV-I/II that were tested in parallel with ARCHITECT

166 rHTLV-I/II and murex recHTLV-I/II in microplate [21]. Our results differed from those

167 obtained by Gantner et al. who reported, on a panel of 66 samples, a sensitivity of LIAISON®

168 XL murex recHTLV-I/II at 78% when comparing with the results obtained with

169 ARCHITECT rHTLV-I/II [24]. However this study included positive samples based on low

170 Architect S/CO values as a reference without confirmatory assay and so may have introduced

171 a classification bias due to the high proportion of false-positive for low Architect S/CO

172 positive values [25]. Surprisingly, to date no other study have compared sensitivities of the

173 Alinity assay to another platform.

174 On a limited number of samples, our study found a specificity of 100% for the three methods.

175 These values are within the range of previous published studies, which found a specificity at

176 99.98% with 95%CI [99.92%-100%] for ARCHITECT rHTLV-I/II [21], at 99.4% with

177 95%CI [98.3%-99.8%] for ARCHITECT rHTLV-I/II [23], at 99.5% with 95%CI [98.0-99.9]

178 for LIAISON® XL murex recHTLV-I/II [25] and 99.92% for the Alinity assay [26].

179 The main limitation of our study was the use of the Architect assay as the screening reference.

180 As a consequence, when testing pure serum samples, we were not able to determine if any of

181 the other tests were more sensitive than the Architect. This point was slightly evaluated with

182 end-point dilutions although results were roughly identical for the three techniques. Moreover,

183 as we had a limited number of negative samples tested, we may have lacked power to rank the

184 assays according to their specificities and had to use the delta coefficient as a surrogate

185 marker. Finally, as we defined positive sample as both ARCHITECT rHTLV-I/II and HTLV

186 BLOT 2.4 positivity we may have missed patients with low reactivity, and as we managed to

187 include only HTLV-I positive samples our results should be taken with caution depending on

188 local epidemiology.

189

6. Conclusion

On a serum panel of 119 infected and 184 uninfected patients with HTLV-I/II, Alinity i rHTLV-I/II and LIAISON® XL murex recHTLV-I/II exhibited a total agreement compared with Architect rHTLV-I/II as the referent assay. These two tests are therefore suitable for the screening of HTLV-I/II infection in donors, subject at risk and patients with ATLL or HAM.

Author contributions

Vincent Guiraud data analyzes, writing- original draft preparation, submission of the final manuscript. Florian Crémoux supervision, acquisition and analyzes of data, validation. Isabelle Leroy visualization, samples testing. Julien Cohier samples testing. Pierre Hernandez samples testing. Safietou Mansaly samples testing and Agnès Gautheret-Dejean conceptualization, methodology, writing- reviewing and editing.

Declaration of Competing Interests

The authors declare that they have no competing financial interests or personal relationships that could have influenced the work reported in this paper.

Ethics

This study complies with Good Clinical Practices and ethical principles of the Helsinki declaration. All data were anonymized before analysis. Patients were systematically notified of any supplementary biological analyses on frozen samples, initially collected as part of routine clinical practice.

References

[1] B.J. Poiesz, F.W. Ruscetti, A.F. Gazdar, P.A. Bunn, J.D. Minna, R.C. Gallo, Detection and isolation of type C retrovirus particles from fresh and cultured lymphocytes of a patient with cutaneous T-cell lymphoma, Proc. Natl. Acad. Sci. 77 (1980) 7415–7419. https://doi.org/10.1073/pnas.77.12.7415.

[2] V.S. Kalyanaraman, M.G. Sarngadharan, M. Robert-Guroff, I. Miyoshi, D. Blayney, D. Golde, R.C. Gallo, A New Subtype of Human T-Cell Leukemia Virus (HTLV-II) Associated with a T-Cell Variant of Hairy Cell Leukemia, Science. 218 (1982) 571–573. https://doi.org/10.1126/science.6981847.

233   [3]   A. Utsunomiya, I. Choi, D. Chihara, M. Seto, Recent advances in the treatment of adult T-cell

234   leukemia-lymphomas, Cancer Sci. 106 (2015) 344–351. https://doi.org/10.1111/cas.12617.

235   [4]   F. Martin, G.P. Taylor, S. Jacobson, Inflammatory manifestations of HTLV-1 and their

236   therapeutic options, Expert Rev. Clin. Immunol. 10 (2014) 1531–1546.

237   https://doi.org/10.1586/1744666X.2014.966690.

238   [5]   A. Gessain, O. Cassar, Epidemiological Aspects and World Distribution of HTLV-1 Infection,

239   Front. Microbiol. 3 (2012). https://doi.org/10.3389/fmicb.2012.00388.

240   [6]   European Centre for Disease Prevention and Control., Geographical distribution of areas with a

241   high prevalence of HTLV-1 infection., Publications Office, LU, 2015.

242   https://data.europa.eu/doi/10.2900/047633 (accessed February 7, 2023).

243   [7]   Y.B. Chang, Z. Kaidarova, D. Hindes, M. Bravo, N. Kiely, H. Kamel, D. Dubay, B. Hoose, E.L.

244   Murphy, Seroprevalence and Demographic Determinants of Human T-Lymphotropic Virus Type

245   1 and 2 Infections Among First-Time Blood Donors--United States, 2000-2009, J. Infect. Dis. 209

246   (2014) 523–531. https://doi.org/10.1093/infdis/jit497.

247   [8]   S. Hino, S. Katamine, K. Kawase, T. Miyamoto, H. Doi, Y. Tsuji, T. Yamabe, Intervention of

248   maternal transmission of HTLV-1 in Nagasaki, Japan, Leukemia. 8 Suppl 1 (1994) S68-70.

249   [9]   D.F. Roucoux, B. Wang, D. Smith, C.C. Nass, J. Smith, S.T. Hutching, B. Newman, T. Lee, D.M.

250   Chafets, E.L. Murphy, HTLV Outcomes Study Investigators, A Prospective Study of Sexual

251   Transmission of Human T Lymphotropic Virus (HTLV)–I and HTLV-II, J. Infect. Dis. 191 (2005)

252   1490–1497. https://doi.org/10.1086/429410.

253   [10]   M. Salemi, A.-M. Vandamme, C. Gradozzi, K. Van Laethem, E. Cattaneo, G. Taylor, C. Casoli, P.

254   Goubau, J. Desmyter, U. Bertazzoni, Evolutionary Rate and Genetic Heterogeneity of Human T-

255   Cell Lymphotropic Virus Type II (HTLV-II) Using Isolates from European Injecting Drug Users, J.

256   Mol. Evol. 46 (1998) 602–611. https://doi.org/10.1007/PL00006340.

257   [11]   on behalf of the Spanish HTLV Network, C. de Mendoza, L. Roc, R. Benito, G. Reina, J.M. Ramos,

258   C. Gómez, A. Aguilera, M. Rodríguez-Iglesias, J. García-Costa, M. Fernández-Alonso, V. Soriano,

259   HTLV-1 infection in solid organ transplant donors and recipients in Spain, BMC Infect. Dis. 19

260   (2019) 706. https://doi.org/10.1186/s12879-019-4346-z.

261   [12]   R. Sobata, C. Matsumoto, S. Uchida, Y. Suzuki, M. Satake, K. Tadokoro, Estimation of the

262   infectious viral load required for transfusion-transmitted human T-lymphotropic virus type 1

263   infection (TT-HTLV-1) and of the effectiveness of leukocyte reduction in preventing TT-HTLV-1,

264   Vox Sang. 109 (2015) 122–128. https://doi.org/10.1111/vox.12263.

265   [13]   World Health Organization, Global status report on blood safety and availability 2021, World

266   Health Organization, Geneva, 2022. https://apps.who.int/iris/handle/10665/356165 (accessed

267   October 6, 2022).

268   [14]   K.R. Campos, M.G. Gonçalves, N.A. Costa, A. Caterino-de-Araujo, Comparative performances of

269   serologic and molecular assays for detecting human T lymphotropic virus type 1 and type 2

270   (HTLV-1 and HTLV-2) in patients infected with human immunodeficiency virus type 1 (HIV-1),

271   Braz. J. Infect. Dis. 21 (2017) 297–305. https://doi.org/10.1016/j.bjid.2017.02.005.

272   [15]   E.L. Murphy, Infection with human T-lymphotropic virus types-1 and -2 (HTLV-1 and -2):

273   Implications for blood transfusion safety, Transfus. Clin. Biol. 23 (2016) 13–19.

274   https://doi.org/10.1016/j.tracli.2015.12.001.

275   [16]   Use of Serological Tests to Reduce the Risk of Transfusion-Transmitted Human T-Lymphotropic

276   Virus Types I and II (HTLV-I/II) - Guidance for industry, (2020). https://www.fda.gov/regulatory-

277   information/search-fda-guidance-documents/use-serological-tests-reduce-risk-transfusion-

278   transmitted-human-t-lymphotropic-virus-types-i-and-ii.

279   [17]   E.C. Sabino, M. Zrein, C.P. Taborda, M.M. Otani, G. Ribeiro-Dos-Santos, A. Sáez-Alquézar,

280   Evaluation of the INNO-LIA HTLV I/II Assay for Confirmation of Human T-Cell Leukemia Virus-

281   Reactive Sera in Blood Bank Donations, J. Clin. Microbiol. 37 (1999) 1324–1328.

282   https://doi.org/10.1128/JCM.37.5.1324-1328.1999.

283   [18]   R.H. Jacobson, Validation of serological assays for diagnosis of infectious diseases: -EN- -FR-

284   Validation des épreuves sérologiques pour le diagnostic des maladies infectieuses -ES-

285   Validación de pruebas serológicas para el diagnóstico de enfermedades infecciosas, Rev. Sci.

286   Tech. OIE. 17 (1998) 469–526. https://doi.org/10.20506/rst.17.2.1119.

287   [19] R Core Team, R: A Language and Environment for Statistical Computing, (n.d.).

288   [20] N. Crofts, W. Maskill, I.D. Gust, Evaluation of enzyme-linked immunosorbent assays: a method

289   of data analysis, J. Virol. Methods. 22 (1988) 51–59. https://doi.org/10.1016/0166-

290   0934(88)90087-0.

291   [21] W.J. Maskill, N. Crofts, E. Waldman, D.S. Healey, T.S. Howard, C. Silvester, I.D. Gust, An

292   evaluation of competitive and second generation ELISA screening tests for antibody to HIV, J.

293   Virol. Methods. 22 (1988) 61–73. https://doi.org/10.1016/0166-0934(88)90088-2.

294   [22] X. Qiu, S. Hodges, T. Lukaszewska, S. Hino, H. Arai, J. Yamaguchi, P. Swanson, G. Schochetman,

295   S.G. Devare, Evaluation of a new, fully automated immunoassay for detection of HTLV-I and

296   HTLV-II antibodies, J. Med. Virol. 80 (2008) 484–493. https://doi.org/10.1002/jmv.21083.

297   [23] K. Malm, T. Kjerstadius, S. Andersson, Evaluation of a new screening assay for HTLV-1 and -2

298   antibodies for large-scale use, J. Med. Virol. 82 (2010) 1606–1611.

299   https://doi.org/10.1002/jmv.21867.

300   [24] P. Gantner, A. Velay, N. Guigue, H. Barth, M.-J. Wendling, C. Delaugerre, S. Fafi-Kremer,

301   Performance of the Liaison® XL Murex recHTLV-I/II Immunoassay in the Detection of HTLV-1/2

302   Antibodies in Serum, Clin. Lab. 63 (2017). https://doi.org/10.7754/Clin.Lab.2017.161026.

303   [25] J.H.C. Tosswill, G.P. Taylor, Interpretation of low reactivity in the Abbott Architect rHTLV I/II

304   assay: Interpretation of low level HTLV reactivity, Transfus. Med. 28 (2018) 326–330.

305   https://doi.org/10.1111/tme.12482.

306   [26] Vokel A, Chen G, Bui T, Specificity of Automated Blood Screening Assays developed for the new

307   Abbott ALINITY S System, (n.d.).

308

309

310 **Table 1**

311 Distribution of S/CO values[1] for positive and negative samples with Architect, Alinity and Liaison

312 assays.

Type of samples		Architect	Alinity	Liaison
Positive samples	S/CO≥1	119	119	119
(n=119)	Minimum	17.4	11.2	26
	Mean	118.4	100.3	130
	Standard deviation	49.1	44.0	31.3
	Maximum	241.4	225.7	190
Negative samples	S/CO<1	184	184	184
(n=184)	Minimum	0.07	0.05	0.21
	Mean	0.19	0.10	0.28
	Standard deviation	0.066	0.030	0.045
	Maximum	0.47	0.28	0.67

313 [1] S/CO, signal/cut off.

314

315

316

317 **Supplemental Table 1**

318 Values of S/CO[1] according to sera dilutions for two HTLV-I-infected patients. Last detectable

319 dilutions (end-point dilutions) are in bold underlined.

Serum dilution	Results for patient 1 with			Results for patient 2 with		
	Architect	Alinity	Liaison	Architect	Alinity	Liaison
1:1	82.32	76.74	140	62.84	60.37	71
1:10	40.7	39.7	73	8.45	**8.35**	**7.40**
1:100	7.51	7.99	18	**1.01**	0.95	0.99
1:200	3.89	4.16	10	0.56	0.52	0.62
1:500	**1.76**	**1.76**	4.5	0.32	0.25	0.36
1:1000	0.96	0.98	**2.4**	0.22	0.18	0.30
1:10000	0.2	0.16	0.45	0.15	0.08	0.26

320 [1] S/CO, signal/cut off. S/CO $\geq$ 1 are positive. Values in bold underlined

321 correspond to the last positive value for each method. Due to low sample

322 volume we were unable to do replicates.

323

324

325   **Supplemental table 2**

326   Reproducibility and repeatability for positive controls with Architect, Alinity and Liaison assays.

	Results for positive and negative controls with		
	Architect	**Alinity**	**Liaison**
Positive controls			
Reproducibility	6.9 (5.6-9.4)[1]	4.7 (3.7-6.4)[1]	9.6 (77-13.1)[1]
(min-max)			
Repeatability	3.7 (3-5.1)	1.3 (1-1.7)	2.3 (1.9-3.2)
(min-max)			
Negative controls			
Reproducibility	6.9 (5.6-9.4)	6.9 (5.6-9.4)	6.9 (5.6-9.4)
(min-max)			
Repeatability	6.9 (5.6-9.4)	6.9 (5.6-9.4)	6.9 (5.6-9.4)
(min-max)			

327   [1] Results are expressed as Coefficient of variation (%) (95% CI). 95% CI, 95% confidence interval.
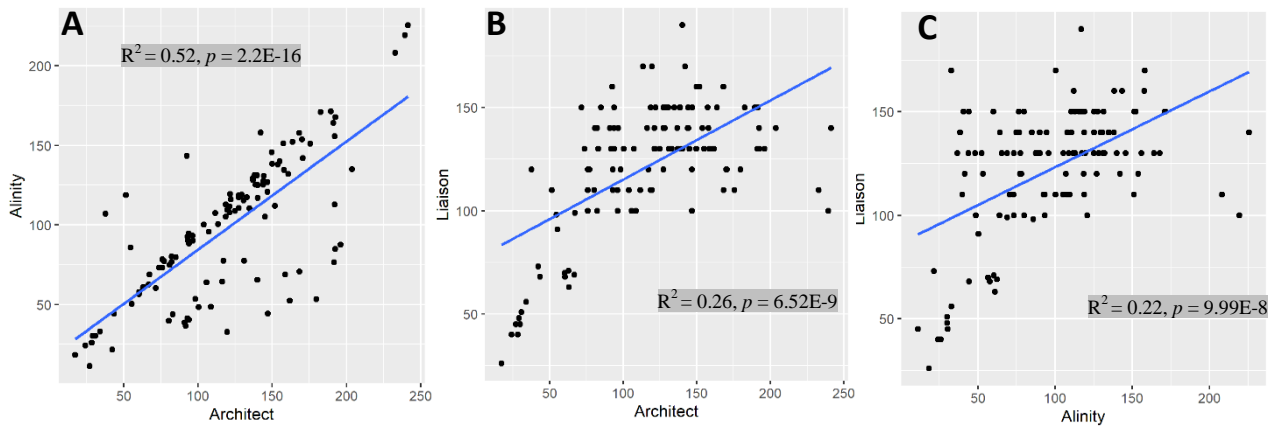
328

329

330

Figure 1: S/CO and correlation for reactive samples for Architect and Alinity (A), Architect and Liaison (B) and Alinity and Liaison (C).

331

332

333

334

335

336

337

338