**Table S2.** Comparison of performance evaluation between commercial serology LFIs for the detection of antibody against SARS-CoV-2.

| Test Name (Developer) | Main Findings | *N* | Subject Categorization | Immunogenic Protein | Sensitivity (%) | Specificity (%) | Reference |
|---|---|---|---|---|---|---|---|
| BioMedomics COVID-19 IgG/IgM Rapid Antibody Test | The assay shows excellent sensitivity & specificity about 1-month post-symptom onset. | 303 | 177 ELISA-positive; 43 ELISA-negative | RBD | 90 (day 28) | 100 (day 28) | [1] |
| 1. Biosynex COVID-19 BSS (Biosynex, Switzerl&, Fribourg)<br>2. COVID-19 Sign IgM/IgG (Servibio/VEDALAB, France, Alençon) | Poor mutual agreement between LFI & ELISA. | 325 | 198 RT-PCR positive; 127 controls | NA | 1.84<br>2.65 | 89 (IgM); 100 (IgG) | [2] |
| 1. NTBIO (NTBIO Diagnostics Inc., Surrey, British Columbia, Canada)<br>2. Orient-Gene (Zhejiang Orient-Gene Biotech Co. Ltd., Huzhou, China)<br>3. MEDsan (MEDsan GmbH, Biological Health Solutions, Hamburg, Germany) | These assays can be used when routine diagnostic serology facility is not available. | 91 | 41 RT-PCR positive; 50 controls | NA | 1. 92%<br>2. 87%<br>3. 100% | 1. 100%<br>2. 98%<br>3. 98% | [3] |
| 1. iCare Covid-19 Rapid Test (Covid-19 IgG/IgM Rapid test Kit) (Nantong Egens Biotechnology Co., Ltd, China);<br>2. Healgen COVID-19 IgG/IgM Rapid Test Cassette (Healgen Scientific Limited Liability Company, USA)*;<br>3. NADAL COVID-19 IgG/IgM Test (nal von minden GmbH, Germany);<br>4. BIOZEK Medical COVID-19 IgG/IgM Rapid Test Cassette (Inzec International Trading, The Netherl&s);<br>5. BIOSYNEX COVID −19 BSS (BIOSYNEX SWISS SA, Switzerl&);<br>6. Panbio COVID-19 IgG/IgM Rapid Test Device (Abbott Rapid Diagnostics Jena GmbH, Germany);<br>7. Acro 2019-nCoV IgG/IgM Rapid Teset(Acro Biotech Inc, USA);<br>8. ichroma COVID-19 Ab+ ichroma II instrument (Boditech Med Incorporated, Republic of Korea); | Only 7 assays are classified as "acceptable". | 292 | 197 pre-pandemic; 65 convalescent plasma | 1. S<br>2. S<br>3. N & S<br>4. N & S<br>5. S<br>6. N<br>7. N & S<br>8. N & S<br>9. N<br>10. N & S<br>11. NA<br>12. N<br>13. NA<br>14. S<br>15. N<br>16. NA<br>17. N & S<br>18. S<br>19. N & S<br>20. N & S<br>21. N<br>22. NA<br>23. N | IgM<br>1. 72.3<br>2. 67.7<br>3. 70.7<br>4. 15.4<br>5. 73.8<br>6. 9.2<br>7. 15.4<br>8. 4.6<br>9. 20<br>10. 55.4<br>11. 46.2<br>12. 63.1<br>13. 67.7<br>15. 81.5<br>16. 69.2<br>17. 78.5<br>18. 16.9<br>19. 96.9<br>20. 76.9<br>22. 60<br>23. 47.6<br>24. 55.4 | IgM<br>1. 89.3<br>2.99<br>3. 98<br>4. 96.4<br>5. 95.9<br>6. 98<br>7. 95.4<br>8. 99.5<br>9. 97<br>10. 99.5<br>11. 95.9<br>12. 96.4<br>13. 95.4<br>15. 94.9<br>16. 98<br>17. 80.8<br>18. 99.5<br>19. 82.1<br>20. 92.8<br>22. 97.9<br>23. 95.2<br>24. 96.4 | [4] |

| | | | |
|---|---|---|---|
| 9. COVID-19 IgG-IgM Rapid test (DIASource ImmunoAssays S.A., Belgium); | 24. S | 25. 20 | 25. 96.9 |
| | 25. N | 26. 24.6 | 26. 98.5 |
| | 26. N | 27. 27.7 | 27. 98.5 |
| 10. Diagnostic Kit for IgM/IgG Antibody to Coronavirus (SARS-CoV-2) (Lateral Flow) (Zhuhai Livzon Diagnostics Inc., China); | 27. N, S & E | 28. 75.4 | 28. 96.9 |
| | 28. N & S | 29. 73.8 | 29. 94.3 |
| | 29. NA | 31. 56.9 | 31. 98.9 |
| | 30. N | | |
| 11. COVISURE™ COVID-19 IgG-IgM Rapid Test (W.H.P.M. Biosearch & Technology Co.,Ltd., China); | 31. N | IgG | IgG |
| | 32. S | 1. 84.6 | 1. 90.9 |
| | | 2. 98.5 | 2. 99 |
| 12. ST&ARD Q COVID-19 IgM/IgG Combo Test (SD Biosensor, Republic of Korea); | | 3. 90.8 | 3. 99.5 |
| | | 4. 92.3 | 4. 99 |
| | | 5. 84.6 | 5. 100 |
| 13. Novel Coronavirus (2019-nCoV) IgG/IgM Test Kit (Colloidal gold) (Genrui Biotech Inc., China); | | 6. 78.5 | 6. 100 |
| | | 7. 87.7 | 7. 99 |
| | | 8. 92.3 | 8. 95.9 |
| 14. WANTAI SARS-CoV-2 Ab Rapid Test (Beijing Wantai Biological Pharmacy Enterprise Co., Ltd., China)*; | | 9. 81.5 | 9. 98.5 |
| | | 10. 60 | 10. 100 |
| | | 11. 58.5 | 11. 95.9 |
| | | 12. 98.5 | 12. 98.5 |
| 15. Leccurate SARS-CoV-2 Antibody Test Kit (Beijing Lepu Medical Technology Co., Ltd., China); | | 13. 75.4 | 13. 99.5 |
| | | 15. 87.7 | 15. 98.5 |
| | | 16. 92.3 | 16. 98 |
| 16. OnSite Covid-19 IgG/IgM (CTK Biotech, USA); | | 17. 96.9 | 17. 91.9 |
| | | 18. 90.8 | 18. 92.9 |
| 17. COVID-19 IgG/IgM Rapid Test Kit (Abbexa Ltd, UK); | | 19. 78.5 | 19. 99.5 |
| | | 20. 66.2 | 20. 99 |
| 18. Anti-SARS-CoV-2 Rapid Test (AutoBio Diagnostics); | | 22. 53.8 | 22. 98 |
| | | 23. 92.1 | 23. 95.2 |
| 19. Instant-View COVID-19 IgG/IgM Antibody Test (Alfa Scientific Designs, Inc. USA); | | 24. 96.9 | 24. 96.9 |
| | | 25. 84.6 | 25. 98.5 |
| | | 26. 78.5 | 26. 98.5 |
| 20. 2019-nCOV IgG/IgM rapid test (Dynamiker Biotechnology (Tianjin) Co., Ltd., China); | | 27. 86.2 | 27. 97 |
| | | 28. 67.7 | 28. 99.5 |
| | | 29. 83.1 | 29. 98.5 |
| 21. INgezim COVID 19 CROM (kassett)(Inmunología y Genética Aplicada, S.A. (INGENASA), Spain); | | 31. 95.4 | 31. 98.9 |
| | | | |
| | | 14. 83.1 | 14. 98 |
| 22. SARS -CoV-2 IgM/IgG Antibody Detection Kit (HONGKONG SENTE | | 21. 80 | 21. 99.5 |
| | | 30. 64.6 | 30. 91.7 |
| | | 32. 100 | 32. 99.5 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| INDUSTRIAL INTERNATIONAL TRADE CO., LIMITED, China);<br>23. COVID19 IgG & IgM Test Kit (colloidal gold method) (Zhejiang Anji Saianfu Biotech Co.,Ltd., China);<br>24. COVID-19 IgG/IgM Rapid Test (Hangzhou AllTest Biotech Co., Ltd., China);<br>25. 2019-nCovid IgG/IgM Rapid Test Cassette (BioMaxima);<br>26. Diagnostic Kit for SARS-Cov-2 IgM/IgG Antibody (Collodial Gold) (Shanghai Kehua Biological Engineering Co., Ltd.);<br>27. nCOVID-19 IgG & IgM POCT (Technogenetics S.r.l, Italy);<br>28. StrongStep® COVID-19 IgG/IgM Combo Test (NanJing Liming Bio-products Co. Ltd.);<br>29. COVID-19 IgG/IgM RAPID TEST (ASSUT EUROPE SPA);<br>30. EBS Alert SARS-CoV-2 ANTIBODY RAPID TEST (Excelsior Bio-System Incorporation);<br>31. Chembio DPP COVID-19 IgM/IgG System 2.0 (Chembio Diag. Systems Inc);<br>32. LumiraDx SARS-CoV-2 Ab Test (LumiraDx UK Ltd) | | | | | | | |
| 1. API<br>2. API (v2)<br>3. BioHit*<br>4. BTNX<br>5. Camtech<br>6. CareHealth<br>7. Cellex<br>8. Edinburgh<br>9. Genobio<br>10. InTec<br>11. KHB<br>12. Lumiquick | The assays' performance varied with tests. | 112 | 56 pre-pandemic; 56 SARS-CoV-2 positive | 1. N & S<br>2. N & S<br>3. N & S<br>4. N & S<br>5. S<br>6. N<br>7. N & S<br>8. N & S<br>9. N & S<br>10. N & S<br>11. N<br>12. N & S | 1. 64.3<br>2. 91.1<br>3. 94.6<br>4. 87<br>5. 78.6<br>6. 91.1<br>7. 82.1<br>8. 63.6<br>9. 70.9<br>10. 82.1<br>11. 69.6<br>12. 72.7 | 1. 100<br>2. 100<br>3. 92.6<br>4. 100<br>5. 100<br>6. 100<br>7. 98.2<br>8. 96.2<br>9. 100<br>10. 98.2<br>11. 100<br>12. 100 | [5] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 13. Oranoxis<br>14. OZO<br>15. Phamatech<br>16. Ray Biotech<br>17. Ray Biotech (v2)<br>18. U2U<br>19. Vivachek<br>20. Zhuhai Livzon | | | | 13. S<br>14. S<br>15. N<br>16. N<br>17. N<br>18. N & S<br>19. N & S<br>20. N & S | 13. 78.2<br>14. 33.9<br>15. 75<br>16. 73.2<br>17. 85.7<br>18. 39.3<br>19. 94.5<br>20. 81.8 | 13. 100<br>14. 100<br>15. 100<br>16. 100<br>17. 100<br>18. 100<br>19. 98.2<br>20. 100 | |
| 1. Biosensor<br>2. AMS International<br>3. Leccurate<br>4. HIGHTOP One Step rapid test<br>5. Cromatest COVID-19<br>6. AMP Rapid Test<br>7. Egens<br>8. Cellex<br>9. Onesite Rapidtest | These assays should not be used as a diagnostic test but can be used to complement RT-PCR. | 293 | 36 asymptomatic; 57 symptomatic; 100 negatives | NA | IgM<br>1. 91.7<br>2. 95.7<br>3. 90<br>4. 82<br>5. 78.03<br>6. 95.7<br>7. 96.88<br>8. 93.75<br>9. 78.03<br><br>IgG<br>1. 79.2<br>2. 91.8<br>3. NR<br>4. 93<br>5. 96.86<br>6. 91.8<br>7. 96.88<br>8. 93.75<br>9. 96.86 | IgM<br>1. 100<br>2. 97.3<br>3. 100<br>4. 96<br>5. 99.39<br>6. 97.3<br>7. 100<br>8. 96.4<br>9. 99.39<br><br>IgG<br>1. 100<br>2. 96.4<br>3. NR<br>4. 97.5<br>5. 100<br>6. 96.4<br>7. 100<br>8. 96.4<br>9. 100 | [6] |
| 1. OnSite COVID-19 IgG/IgM Rapid Test (CTK Biotech Inc., CA, USA)<br>2. VivaDiag COVID-19 IgM/IgG Rapid Test (VivaChek, Wilmington, USA)<br>3. Hangzhou AllTest COVID-19 test (Hangzhou AllTest Biotech, Hangzhou, China)<br>4. Wondfo SARS-CoV-2 Antibody Test (Guangzhou Wondfo Biotech, Guagzhou, China)<br>5. Hightop SARS-CoV-2 IgM/IgG Antibody Rapid Test | These assays should not be used as a diagnostic test. | 183 | 91 RT-PCR positive | NA | 1. 1. 84.6<br>2. 2. 78.5<br>3. 3. 90.8<br>4. 4. 93.8<br>5. 5. 93.8 | 1. 95.6<br>2. 97.8<br>3. 96.7<br>4. 97<br>5. 100 | [7] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. 2019-nCoV IgG/IgM Rapid Test (Acro Biotech Inc., CA, USA)<br>2. Anti-SARS-CoV-2 Rapid Test (Autobio Diagnostics Co. Ltd, Zhengzhou, China)<br>3. COVID-19 IgG/IgM Rapid Test (Healgen Scientific Limited Liability Company, Houston, TX, USA/Zhejiang Orient Gene Biotech Co. Ltd, Zhejiang, China)*<br>4. NADAL COVID-19 IgG/IgM Test (Nal von Minden GmbH, Moers, Germany)<br>5. OnSite COVID-19 IgG/IgM Rapid Test (CTK Biotech Inc., CA, USA) | These assays have difficulty in detecting samples with low IgG titer which must be taken into considerations when choosing antibody tests. | 183 | 87 RT-PCR positive; 96 RT-PCR negative | 1. NA<br>2. S<br>3. S1<br>4. NA<br>5. S1 | 1. 78.2<br>2. 58.6<br>3. 81.6<br>4. 56.3<br>5. 67.8 | 99 (for all) | [8] |
| 1. Accu-Tell COVID-19 IgG/IgM Rapid Test (AccuBioTech, Beijing, China);<br>2. The Diagnostic Kit for IgM / IgG Antibody to Coronavirus (SARS-CoV-2) (Lateral Flow) (Zhuhai Livzon Diagnostics, Zhuhai, China);<br>3. Coronavirus (COVID-19) IgM/IgG Rapid Test Kit (ISIA BIO-Technology, Chongqing, China);<br>4. H2019-nCoV IgM Antibody Test Kit (Hecin Biotech Co., Ltd., Guangzhou, China)<br>5. COVID-19 IgG/IgM Rapid Test Kit (UNscience Biotechnology, Wuhan, China);<br>6. 2019-nCoV IgM/IgG Rapid Test (Acro Biotech, CA, USA) | These assays have a good capacity to detect SARS-CoV-2 antibodies two weeks post-symptom onset. | 58 | 38 RT-PCR positive; 20 controls | NA | IgM<br>1. 91.7<br>2. 80<br>3. 93.3<br>4. 86.7<br>5. 80<br>6. 76.9<br>IgG<br>1. 84.6<br>2. 86.7<br>3. 80<br>4. 86.7<br>5. 84.6 | IgM<br>1. 100<br>2. 95<br>3. 100<br>4. 100<br>5. 65<br>6. 100<br>IgG<br>1. 100<br>2. 100<br>3. 100<br>4. 95<br>5. 100 | [9] |
| AllTest 2019-nCoV IgG/IgM Rapid Test Cassette (Hangzhou AllTest Biotech, Hangzhou, China) | Antibody response varied with different clinical manifestations & disease severity. Patients with symptoms & IgM positive have a shorter duration of viral shedding & no worsening clinical conditions. | 61 | 14 RT-PCR positive; 28 controls | N | 78.6 | 100 | [10] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| AllTest 2019-nCoV IgG/IgM Rapid Test Cassette (Hangzhou AllTest Biotech, Hangzhou, China) | This assay was a reliable tool for diagnosis SARS-CoV-2 infection from 14 days post-symptomatic especially among RT-PCR negative patients. | 251 | 90 RT-PCR positive; 161 RT-PCR negative | N | 64.4 | 100 | [11] |
| Colloidal gold immunochromatography antibody detection kit (Shanghai Outdo Biotech, China) | This assay has the potential for use as a rapid diagnosis test for COVID-19 | 150 | 150 suspected cases; 97 RT-PCR positive | S, M & N | 71.1 | 96.2 | [12] |
| COVID-19 IgG/IgM Rapid Test Cassette (Zhejiang Orient Gene Biotech, Huzhou, China) | This assay is suitable for assessing previous exposure. Negative results may be unreliable during the first weeks after infection. | 153 | 29 RT-PCR positive; 124 controls | NA | 69.0 (IgM)<br>93.1 (IgG) | 100 (IgM)<br>99.2 (IgG) | [13] |
| COVID-19 IgG/IgM Rapid Test Cassette (Zhejiang Orient Gene Biotech, Huzhou, China) | This assay is suitable for routine use for patients with onset of symptoms ≥ 10 days ago. | 148 | 102 RT-PCR positive | NA | 95.8 | 100 | [14] |
| Livzon IgM/IgG Diagnostic Kit for IgM/IgG Antibody to Coronovirus (SARS-Cov-2) Lateral Flow (Zhuhai Livzon Diagnostics, Zhuhai, China) | IgM-positive rate increased from 11.1% in early-stage to 74.2% in late-stage disease. IgG-positive rate increased from 3.6% in early-stage to 96.8% in late-stage disease. | 86 | 67 RT-PCR positive | NA | 11.1 (< 7days)<br>92.9 (7-14 days)<br>96.8 (14 days) | NA | [15] |
| One Step Novel Coronavirus (COVID-19) IgM/IgG Antibody Test (Artron, Burnaby, Canada) | This assay is not recommended as initial COVID-19 diagnostic test. | 186 | 112 RT-PCR positive | NA | 43.2 | 98 | [16] |
| 1. Rapid SARS -CoV-2 Antibody (IgM/IgG) Test (InTec, Xiamen, China);<br>2. qSARS-CoV-2 IgG/IgM Cassette Rapid Test (GICA) (Cellex, NC, USA)*;<br>3. COVID-19 IgG/IgM Rapid Test Cassette (Healgen Scientific, Houston, USA)* | These assays have sufficient PPV in high seroprevalence scenarios (≥ 50%). They might have a role for diagnostic among individual with a sufficiently high pretest probability to supplement RT-PCR. They are suitable for use in general population to rule out the presence of SARS-CoV-2 antibodies. | 334 | 107 RT-PCR positive | 1. N<br>2. S & N<br>3. S & N | 1. 90<br>2. 80<br>3. 100 | 1. 85<br>2. 99<br>3. 88 | [17] |
| SARS-CoV-2 IgG/IgM antibody test kit (Innovita Biological Technology Co., Ltd, Tangshan, Hebei, China) | This assay can be used to complement RT-PCR. | 179 | 90 RT-PCR positive; 89 RT-PCR negative | NA | 85.6 | 91 | [18] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| The Diagnostic Kit for IgM / IgG Antibody to Coronavirus (SARS-CoV-2) (Lateral Flow) (Zhuhai Livzon Diagnostics, Zhuhai, China) | This assay can be used for clinical reference. | 189 | 154 patients; 35 controls | NA | 82.4 | 100 | [19] † |
| VivaDiag COVID-19 IgM/IgG Rapid Test (VivaChek, Wilmington, USA) | Not recommended for triage of patients with suspected COVID-19. | 110 | 30 RT-PCR positive; 50 with respiratory symptoms; 30 RT-PCR negative | RBD | 18.4 | 91.7 | [20] |
| VivaDiag COVID-19 IgM/IgG Rapid Test (VivaChek, Wilmington, USA) | This assay provides information on immunoreaction of individuals. | 191 | 191 symptomatic patients | RBD | 30 | 89 | [21] |
| 2019-nCoV IgG/IgM Antibody Rapid Test Kit (Beijing Diagreat Biotechnologies, Beijing, China) | This assay is quite reliable & useful. | 41 | 27 RT-PCR positive; 7 symptomatic RT-PCR negative; 7 controls | NA | 83 | 93 | [22] |
| 2019-nCoV Ab Test (Colloidal Gold) (Innovita Biological Technology, Beijing, China)* | This assay can be used as an effective supplementary indicator for suspected cases with negative RT-PCR results. | 76 | 38 symptomatic patients | NA | 50 (IgM)<br>92.1 (IgG) | NA | [23] |
| 1. 2019-nCoV Ab Test (Colloidal Gold) (Innovita Biological Technology, Beijing, China)*;<br>2. SD Biosensor Test (SD Biosensor, Korea);<br>3. Wondfo test (Guangzhou Wondfo Biotech, Guagzhou, China)<br>4. Runkun test (Runkun Pharmaceutical, Hunan, China) | | 1195 | 570 symptomatic; 625 asymptomatic | NA | 1. 93<br>2. 94<br>3. 98<br>4. 76 | 1. 49<br>2. 69<br>3. 75<br>4. 69 | [24] |
| 1. 2019-n-CoV IgG/IgM rapid test cassette (Bio Marketing Diagnostics, Akiva, Israel);<br>2. Novel Coronavirus (2019-n-CoV) antibody IgG/IgM assay (colloidal gold) (Avioq, Bio-Tech, Sh&ong, China);<br>3. QuickZen COVID-19 IgM/IgG Kit (ZenTech, Angleur, Belgium) | Overall sensitivity was similar (~70 %). Sensitivity increased during the second week after post-symptomatic onset (91-94%). | 400 | 128 RT-PCR positive; 272 controls | NA | 1. 71.9<br>2. 68.8<br>3. 71.1 | 1. 100<br>2. 95.8<br>3. 100 | [25] |

NA, not available.

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