|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Authors** | **Year** | **Cancer** | **Treatment** | **Biomarker** | **Maximum balance accuracy** | **Total** | **Sensitivity** | **Specificity** | **PPV** | **NPV** | **FPR** | **FDR** | **FOR** | **FNR** |
| Rizvi et al. | 2018 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.614 | 76 | 0.640 | 0.588 | 0.432 | 0.769 | 0.412 | 0.568 | 0.231 | 0.360 |
| Taube et al. | 2014 | Multiple cancers | Anti–PD-1 therapy | PD-L1 IHC | 0.724 | 41 | 0.900 | 0.548 | 0.391 | 0.944 | 0.452 | 0.609 | 0.056 | 0.100 |
| Powles et al. | 2014 | Urothelial | Anti–PD-1 therapy | PD-L1 IHC | 0.692 | 59 | 0.765 | 0.619 | 0.448 | 0.867 | 0.381 | 0.552 | 0.133 | 0.235 |
| Grosso et al. | 2013 | Melanoma | Anti–PD-1 therapy | PD-L1 IHC | 0.663 | 34 | 0.700 | 0.625 | 0.438 | 0.833 | 0.375 | 0.563 | 0.167 | 0.300 |
| Gettinger et al. | 2014 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.833 | 15 | 1.000 | 0.667 | 0.667 | 1.000 | 0.333 | 0.333 | 0.000 | 0.000 |
| Topalian et al. | 2012 | Multiple cancers | Anti–PD-1 therapy | PD-L1 IHC | 0.758 | 42 | 1.000 | 0.515 | 0.360 | 1.000 | 0.485 | 0.640 | 0.000 | 0.000 |
| Kefford et al. | 2014 | Melanoma | Anti–PD-1 therapy | PD-L1 IHC | 0.661 | 71 | 0.966 | 0.357 | 0.509 | 0.938 | 0.643 | 0.491 | 0.063 | 0.034 |
| Herbst et al. | 2014 | Multiple cancers | Anti–PD-1 therapy | PD-L1 IHC | 0.644 | 145 | 0.441 | 0.847 | 0.469 | 0.832 | 0.153 | 0.531 | 0.168 | 0.559 |
| Herbst et al. | 2014 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.693 | 44 | 0.417 | 0.969 | 0.833 | 0.816 | 0.031 | 0.167 | 0.184 | 0.583 |
| Spigel DR et al. | 2013 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.750 | 30 | 0.500 | 1.000 | 1.000 | 0.846 | 0.000 | 0.000 | 0.154 | 0.500 |
| Carbone DP et al. | 2017 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.637 | 158 | 0.553 | 0.721 | 0.456 | 0.792 | 0.279 | 0.544 | 0.208 | 0.447 |
| Gandara et al. | 2019 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.582 | 578 | 0.711 | 0.454 | 0.165 | 0.912 | 0.546 | 0.835 | 0.088 | 0.289 |
| Hellmann et al. | 2018 | SCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.473 | 75 | 0.100 | 0.846 | 0.091 | 0.859 | 0.154 | 0.909 | 0.141 | 0.900 |
| Hellmann et al. | 2018 | NSCLC | Anti–PD-1 + anti-CTLA4 therapy | PD-L1 IHC | 0.649 | 70 | 0.821 | 0.476 | 0.511 | 0.800 | 0.524 | 0.489 | 0.200 | 0.179 |
| Weber et al. | 2013 | Melanoma | Anti–PD-1 therapy | PD-L1 IHC | 0.719 | 44 | 0.571 | 0.867 | 0.667 | 0.813 | 0.133 | 0.333 | 0.188 | 0.429 |
| Daud et al. | 2014 | Melanoma | Anti–PD-1 therapy | PD-L1 IHC | 0.666 | 71 | 0.967 | 0.366 | 0.527 | 0.938 | 0.634 | 0.473 | 0.063 | 0.033 |
| Borghaei et al. | 2015 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.688 | 231 | 0.708 | 0.667 | 0.358 | 0.897 | 0.333 | 0.642 | 0.103 | 0.292 |
| Garon et al. | 2015 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.681 | 325 | 0.622 | 0.741 | 0.414 | 0.869 | 0.259 | 0.586 | 0.131 | 0.378 |
| Garon et al. | 2015 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.685 | 121 | 0.619 | 0.750 | 0.342 | 0.904 | 0.250 | 0.658 | 0.096 | 0.381 |
| Garon et al. | 2015 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.679 | 204 | 0.623 | 0.735 | 0.452 | 0.847 | 0.265 | 0.548 | 0.153 | 0.377 |
| Garon et al. | 2015 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.685 | 121 | 0.619 | 0.750 | 0.342 | 0.904 | 0.250 | 0.658 | 0.096 | 0.381 |
| Garon et al. | 2015 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.679 | 204 | 0.623 | 0.735 | 0.452 | 0.847 | 0.265 | 0.548 | 0.153 | 0.377 |
| Garon et al. | 2015 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.681 | 325 | 0.622 | 0.741 | 0.414 | 0.869 | 0.259 | 0.586 | 0.131 | 0.378 |
| Larkin et al. | 2015 | Melanoma | Anti–PD-1 therapy | PD-L1 IHC | 0.565 | 288 | 0.348 | 0.782 | 0.575 | 0.587 | 0.218 | 0.425 | 0.413 | 0.652 |
| Larkin et al. | 2015 | Melanoma | Anti–PD-1 + anti-CTLA4 therapy | PD-L1 IHC | 0.566 | 278 | 0.299 | 0.833 | 0.721 | 0.452 | 0.167 | 0.279 | 0.548 | 0.701 |
| Rosenberg et al. | 2016 | Urothelial | Anti–PD-1 therapy | PD-L1 IHC | 0.651 | 263 | 0.578 | 0.725 | 0.302 | 0.893 | 0.275 | 0.698 | 0.107 | 0.422 |
| Ready et al. | 2019 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.663 | 234 | 0.770 | 0.556 | 0.445 | 0.840 | 0.444 | 0.555 | 0.160 | 0.230 |
| Hellmann et al. | 2019 | NSCLC | Anti–PD-1 + anti-CTLA4 therapy | PD-L1 IHC | 0.550 | 517 | 0.736 | 0.364 | 0.408 | 0.698 | 0.636 | 0.592 | 0.302 | 0.264 |
| Hellmann et al. | 2019 | NSCLC | Anti–PD-1 therapy + chemo | PD-L1 IHC | 0.454 | 508 | 0.619 | 0.289 | 0.316 | 0.589 | 0.711 | 0.684 | 0.411 | 0.381 |
| Gandhi et al. | 2018 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.600 | 387 | 0.777 | 0.424 | 0.550 | 0.677 | 0.576 | 0.450 | 0.323 | 0.223 |
| Langer et al. | 2019 | NSCLC | Anti–PD-1 therapy + chemo | PD-L1 IHC | 0.668 | 60 | 0.485 | 0.852 | 0.800 | 0.575 | 0.148 | 0.200 | 0.425 | 0.515 |
| Paz Ares et al. | 2018 | NSCLC | Anti–PD-1 therapy + chemo | PD-L1 IHC | 0.494 | 271 | 0.264 | 0.724 | 0.534 | 0.449 | 0.276 | 0.466 | 0.551 | 0.736 |
| Mok et al. | 2019 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.650 | 553 | 0.678 | 0.623 | 0.452 | 0.808 | 0.377 | 0.548 | 0.192 | 0.322 |
| Socinski et al. | 2018 | NSCLC | Anti–PD-1 therapy + chemo | PD-L1 IHC | 0.595 | 356 | 0.597 | 0.593 | 0.747 | 0.422 | 0.407 | 0.253 | 0.578 | 0.403 |
| Antonia et al. | 2016 | SCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.474 | 113 | 0.792 | 0.157 | 0.202 | 0.737 | 0.843 | 0.798 | 0.263 | 0.208 |
| Chung et al. | 2018 | SCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.734 | 92 | 0.833 | 0.635 | 0.357 | 0.940 | 0.365 | 0.643 | 0.060 | 0.167 |
| Cohen et al. | 2019 | Head and neck | Anti–PD-1 therapy | PD-L1 IHC | 0.623 | 199 | 0.472 | 0.773 | 0.315 | 0.869 | 0.227 | 0.685 | 0.131 | 0.528 |
| Mehra et al. | 2018 | Head and neck | Anti–PD-1 therapy | PD-L1 IHC | 0.496 | 188 | 0.647 | 0.344 | 0.179 | 0.815 | 0.656 | 0.821 | 0.185 | 0.353 |
| Mehra et al. | 2018 | Head and neck | Anti–PD-1 therapy | PD-L1 IHC | 0.581 | 188 | 0.941 | 0.221 | 0.211 | 0.944 | 0.779 | 0.789 | 0.056 | 0.059 |
| Baumi et al. | 2017 | Head and neck | Anti–PD-1 therapy | PD-L1 IHC | 0.624 | 144 | 0.464 | 0.784 | 0.342 | 0.858 | 0.216 | 0.658 | 0.142 | 0.536 |
| Muro et al. | 2016 | Gastric/GEJ | Anti–PD-1 therapy | PD-L1 IHC | 0.525 | 35 | 0.125 | 0.926 | 0.333 | 0.781 | 0.074 | 0.667 | 0.219 | 0.875 |
| Fuchs et al. | 2018 | Gastric/GEJ | Anti–PD-1 therapy | PD-L1 IHC | 0.601 | 216 | 0.767 | 0.435 | 0.180 | 0.920 | 0.565 | 0.820 | 0.080 | 0.233 |
| Shah et al. | 2018 | Multiple cancers | Anti–PD-1 therapy | PD-L1 IHC | 0.594 | 108 | 0.667 | 0.521 | 0.148 | 0.926 | 0.479 | 0.852 | 0.074 | 0.333 |
| Yanjigian et al. | 2019 | Gastric/GEJ | Anti–PD-1 therapy | PD-L1 IHC | 0.667 | 36 | 0.667 | 0.667 | 0.154 | 0.957 | 0.333 | 0.846 | 0.043 | 0.333 |
| Yanjigian et al. | 2019 | Gastric/GEJ | Anti–PD-1 + anti-CTLA4 therapy | PD-L1 IHC | 0.625 | 74 | 0.500 | 0.750 | 0.318 | 0.865 | 0.250 | 0.682 | 0.135 | 0.500 |
| Motzer et al. | 2018 | RCC | Anti–PD-1 therapy | PD-L1 IHC | 0.620 | 184 | 0.611 | 0.629 | 0.637 | 0.602 | 0.371 | 0.363 | 0.398 | 0.389 |
| Tykodi et al. | 2019 | RCC | Anti–PD-1 therapy | PD-L1 IHC | 0.580 | 110 | 0.575 | 0.586 | 0.442 | 0.707 | 0.414 | 0.558 | 0.293 | 0.425 |
| Motzer et al. | 2019 | RCC | Anti–PD-1 therapy | PD-L1 IHC | 0.577 | 412 | 0.676 | 0.479 | 0.660 | 0.497 | 0.521 | 0.340 | 0.503 | 0.324 |
| Rini et al. | 2019 | RCC | Anti–PD-1 therapy | PD-L1 IHC | 0.554 | 424 | 0.458 | 0.651 | 0.458 | 0.651 | 0.349 | 0.542 | 0.349 | 0.542 |
| Plimack et al. | 2017 | Urothelial | Anti–PD-1 therapy | PD-L1 IHC | 0.600 | 25 | 0.600 | 0.600 | 0.273 | 0.857 | 0.400 | 0.727 | 0.143 | 0.400 |
| Bellmunt et al. | 2017 | Urothelial | Anti–PD-1 therapy | PD-L1 IHC | 0.511 | 235 | 0.281 | 0.742 | 0.258 | 0.763 | 0.258 | 0.742 | 0.237 | 0.719 |
| Balar et al. | 2017 | Urothelial | Anti–PD-1 therapy | PD-L1 IHC | 0.542 | 119 | 0.333 | 0.750 | 0.281 | 0.793 | 0.250 | 0.719 | 0.207 | 0.667 |
| Rosenberg et al. | 2016 | Urothelial | Anti–PD-1 therapy | PD-L1 IHC | 0.651 | 263 | 0.578 | 0.725 | 0.302 | 0.893 | 0.275 | 0.698 | 0.107 | 0.422 |
| Rosenberg et al. | 2016 | Urothelial | Anti–PD-1 therapy | PD-L1 IHC | 0.516 | 310 | 0.156 | 0.875 | 0.175 | 0.859 | 0.125 | 0.825 | 0.141 | 0.844 |
| Patel et al. | 2018 | Urothelial | Anti–PD-1 therapy | PD-L1 IHC | 0.598 | 114 | 0.600 | 0.596 | 0.294 | 0.841 | 0.404 | 0.706 | 0.159 | 0.400 |
| Powles et al. | 2017 | Urothelial | Anti–PD-1 therapy | PD-L1 IHC | 0.670 | 144 | 0.871 | 0.469 | 0.310 | 0.930 | 0.531 | 0.690 | 0.070 | 0.129 |
| Overman et al. | 2017 | Colon | Anti–PD-1 therapy | PD-L1 IHC | 0.505 | 68 | 0.316 | 0.694 | 0.286 | 0.723 | 0.306 | 0.714 | 0.277 | 0.684 |
| Overman et al. | 2018 | Colon | Anti–PD-1 therapy | PD-L1 IHC | 0.506 | 91 | 0.292 | 0.721 | 0.538 | 0.477 | 0.279 | 0.462 | 0.523 | 0.708 |
| Eng et al. | 2019 | Colon | Anti–PD-1 therapy + MEK | PD-L1 IHC | 0.587 | 183 | 0.600 | 0.573 | 0.038 | 0.981 | 0.427 | 0.962 | 0.019 | 0.400 |
| Eng et al. | 2019 | Colon | Anti–PD-1 therapy | PD-L1 IHC | 0.557 | 90 | 0.500 | 0.614 | 0.029 | 0.982 | 0.386 | 0.971 | 0.018 | 0.500 |
| El-Khoueiry et al. | 2017 | HCC | Anti–PD-1 therapy | PD-L1 IHC | 0.611 | 41 | 0.429 | 0.794 | 0.300 | 0.871 | 0.206 | 0.700 | 0.129 | 0.571 |
| El-Khoueiry et al. | 2017 | HCC | Anti–PD-1 therapy | PD-L1 IHC | 0.535 | 168 | 0.257 | 0.812 | 0.265 | 0.806 | 0.188 | 0.735 | 0.194 | 0.743 |
| Zhu et al. | 2018 | HCC | Anti–PD-1 therapy | PD-L1 IHC | 0.634 | 104 | 0.722 | 0.547 | 0.250 | 0.904 | 0.453 | 0.750 | 0.096 | 0.278 |
| Zhu et al. | 2018 | HCC | Anti–PD-1 therapy | PD-L1 IHC | 0.632 | 103 | 0.722 | 0.541 | 0.250 | 0.902 | 0.459 | 0.750 | 0.098 | 0.278 |
| Schmid et al. | 2018 | Breast | Anti–PD-1 therapy + chemo | PD-L1 IHC | 0.527 | 434 | 0.433 | 0.621 | 0.612 | 0.441 | 0.379 | 0.388 | 0.559 | 0.567 |
| Adams et al. | 2019 | Breast | Anti–PD-1 therapy | PD-L1 IHC | 0.513 | 145 | 0.667 | 0.360 | 0.065 | 0.942 | 0.640 | 0.935 | 0.058 | 0.333 |
| Dirix et al. | 2017 | Breast | Anti–PD-1 therapy | PD-L1 IHC | 0.542 | 136 | 0.250 | 0.833 | 0.043 | 0.973 | 0.167 | 0.957 | 0.027 | 0.750 |
| Dirix et al. | 2017 | Breast | Anti–PD-1 therapy | PD-L1 IHC | 0.712 | 136 | 0.500 | 0.924 | 0.167 | 0.984 | 0.076 | 0.833 | 0.016 | 0.500 |
| Kaufman et al. | 2018 | MCC | Anti–PD-1 therapy | PD-L1 IHC | 0.649 | 74 | 0.458 | 0.840 | 0.579 | 0.764 | 0.160 | 0.421 | 0.236 | 0.542 |
| Kaufman et al. | 2016 | MCC | Anti–PD-1 therapy | PD-L1 IHC | 0.562 | 74 | 0.870 | 0.255 | 0.345 | 0.813 | 0.745 | 0.655 | 0.188 | 0.130 |
| Nghiem et al. | 2019 | MCC | Anti–PD-1 therapy | PD-L1 IHC | 0.522 | 46 | 0.519 | 0.526 | 0.609 | 0.435 | 0.474 | 0.391 | 0.565 | 0.481 |
| Nghiem et al. | 2019 | MCC | Anti–PD-1 therapy | PD-L1 IHC | 0.523 | 46 | 0.889 | 0.158 | 0.600 | 0.500 | 0.842 | 0.400 | 0.500 | 0.111 |
| Nghiem et al. | 2019 | MCC | Anti–PD-1 therapy | PD-L1 IHC | 0.523 | 46 | 0.889 | 0.158 | 0.600 | 0.500 | 0.842 | 0.400 | 0.500 | 0.111 |
| Chung et al. | 2019 | Cervical | Anti–PD-1 therapy | PD-L1 IHC | 0.472 | 84 | 0.800 | 0.145 | 0.169 | 0.769 | 0.855 | 0.831 | 0.231 | 0.200 |
| Herbst et al. | 2016 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.660 | 690 | 0.683 | 0.638 | 0.297 | 0.900 | 0.362 | 0.703 | 0.100 | 0.317 |
| Hellmann et al. | 2018 | NSCLC | Anti–PD-1 + anti-CTLA4 therapy | PD-L1 IHC | 0.529 | 139 | 0.758 | 0.301 | 0.495 | 0.579 | 0.699 | 0.505 | 0.421 | 0.242 |
| Wolchok et al. | 2017 | Melanoma | Anti–PD-1 therapy | PD-L1 IHC | 0.594 | 288 | 0.694 | 0.494 | 0.544 | 0.650 | 0.506 | 0.456 | 0.350 | 0.306 |
| Wolchok et al. | 2017 | Melanoma | Anti–PD-1 +anti-CTLA4 therapy | PD-L1 IHC | 0.586 | 278 | 0.235 | 0.938 | 0.848 | 0.453 | 0.063 | 0.152 | 0.547 | 0.765 |
| Weber et al. | 2015 | Melanoma | Anti–PD-1 therapy | PD-L1 IHC | 0.635 | 119 | 0.649 | 0.622 | 0.436 | 0.797 | 0.378 | 0.564 | 0.203 | 0.351 |
| Rittmeyer et al. | 2017 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.624 | 421 | 0.386 | 0.863 | 0.306 | 0.900 | 0.137 | 0.694 | 0.100 | 0.614 |
| Wolchok et al. | 2017 | Melanoma | Anti–PD-1 + anti-CTLA4 therapy | PD-L1 IHC | 0.525 | 35 | 0.400 | 0.650 | 0.462 | 0.591 | 0.350 | 0.538 | 0.409 | 0.600 |
| Daud et al. | 2016 | Melanoma | Anti–PD-1 therapy | PD-L1 IHC | 0.592 | 451 | 0.875 | 0.309 | 0.448 | 0.794 | 0.691 | 0.552 | 0.206 | 0.125 |
| Robert et al. | 2015 | Melanoma | Anti–PD-1 therapy | PD-L1 IHC | 0.596 | 209 | 0.464 | 0.728 | 0.534 | 0.669 | 0.272 | 0.466 | 0.331 | 0.536 |
| Postow et al. | 2015 | Melanoma | Anti–PD-1 + anti-CTLA4 therapy | PD-L1 IHC | 0.513 | 80 | 0.311 | 0.714 | 0.583 | 0.446 | 0.286 | 0.417 | 0.554 | 0.689 |
| Ferris et al. | 2016 | Head and neck | Anti–PD-1 therapy | PD-L1 IHC | 0.637 | 161 | 0.500 | 0.774 | 0.279 | 0.898 | 0.226 | 0.721 | 0.102 | 0.500 |
| Sharma et al. | 2017 | Head and neck | Anti–PD-1 therapy | PD-L1 IHC | 0.561 | 265 | 0.558 | 0.563 | 0.238 | 0.839 | 0.437 | 0.762 | 0.161 | 0.442 |
| Sharma et al. | 2017 | Multiple cancers | Anti–PD-1 therapy | PD-L1 IHC | 0.585 | 265 | 0.442 | 0.728 | 0.284 | 0.842 | 0.272 | 0.716 | 0.158 | 0.558 |
| Puzanov et al. | 2015 | Melanoma | Anti–PD-1 therapy | PD-L1 IHC | 0.349 | 286 | 0.527 | 0.171 | 0.399 | 0.258 | 0.829 | 0.601 | 0.742 | 0.473 |
| Larkin et al. | 2018 | Melanoma | Anti–PD-1 therapy | PD-L1 IHC | 0.672 | 248 | 0.696 | 0.648 | 0.432 | 0.847 | 0.352 | 0.568 | 0.153 | 0.304 |
| Horn et al. | 2017 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.519 | 104 | 0.550 | 0.488 | 0.204 | 0.820 | 0.512 | 0.796 | 0.180 | 0.450 |
| Chow et al. | 2016 | Head and neck | Anti–PD-1 therapy | PD-L1 IHC | 0.521 | 132 | 0.708 | 0.333 | 0.191 | 0.837 | 0.667 | 0.809 | 0.163 | 0.292 |
| Chow et al. | 2016 | Head and neck | Anti–PD-1 therapy | PD-L1 IHC | 0.590 | 132 | 0.958 | 0.222 | 0.215 | 0.960 | 0.778 | 0.785 | 0.040 | 0.042 |
| Gagdeel et al. | 2020 | NSCLC | Anti–PD-1 therapy + chemo | PD-L1 IHC | 0.604 | 387 | 0.780 | 0.428 | 0.558 | 0.677 | 0.572 | 0.442 | 0.323 | 0.220 |
| Choueiri et al. | 2020 | RCC | Anti–PD-1 therapy + chemo | PD-L1 IHC | 0.542 | 442 | 0.651 | 0.433 | 0.559 | 0.529 | 0.567 | 0.441 | 0.471 | 0.349 |
| Antonarakis et al. | 2020 | Prostate | Anti–PD-1 therapy | PD-L1 IHC | 0.557 | 199 | 0.778 | 0.337 | 0.053 | 0.970 | 0.663 | 0.947 | 0.030 | 0.222 |
| Unmera et al. | 2020 | RCC | Anti–PD-1 therapy + chemo | PD-L1 IHC | 0.548 | 409 | 0.656 | 0.440 | 0.594 | 0.506 | 0.560 | 0.406 | 0.494 | 0.344 |
| McGregor et al. | 2020 | RCC | Anti–PD-1 therapy + chemo | PD-L1 IHC | 0.716 | 36 | 0.692 | 0.739 | 0.600 | 0.810 | 0.261 | 0.400 | 0.190 | 0.308 |
| Kato et al. | 2020 | Esophageal | Anti–PD-1 therapy | PD-L1 IHC | 0.728 | 34 | 0.714 | 0.741 | 0.417 | 0.909 | 0.259 | 0.583 | 0.091 | 0.286 |
| Hui et al. | 2020 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.695 | 91 | 0.583 | 0.806 | 0.519 | 0.844 | 0.194 | 0.481 | 0.156 | 0.417 |
| Felip et al. | 2020 | NSCLC | Anti–PD-1 therapy | PD-L1 IHC | 0.384 | 30 | 0.643 | 0.125 | 0.391 | 0.286 | 0.875 | 0.609 | 0.714 | 0.357 |
| Rizvi et al. | 2015 | NSCLC | Anti–PD-1 therapy | TMB | 0.758 | 34 | 0.833 | 0.682 | 0.588 | 0.882 | 0.318 | 0.412 | 0.118 | 0.167 |
| Rizvi et al. | 2015 | NSCLC | Anti–PD-1 therapy | TMB | 0.864 | 16 | 1.000 | 0.727 | 0.625 | 1.000 | 0.273 | 0.375 | 0.000 | 0.000 |
| Rizvi et al. | 2015 | NSCLC | Anti–PD-1 therapy | TMB | 0.675 | 18 | 0.714 | 0.636 | 0.556 | 0.778 | 0.364 | 0.444 | 0.222 | 0.286 |
| Rizvi et al. | 2018 | NSCLC | Anti–PD-1 therapy | Multimodal | 0.602 | 76 | 0.400 | 0.804 | 0.500 | 0.732 | 0.196 | 0.500 | 0.268 | 0.600 |
| Rizvi et al. | 2018 | NSCLC | Anti–PD-1 therapy | TMB | 0.584 | 76 | 0.600 | 0.569 | 0.405 | 0.744 | 0.431 | 0.595 | 0.256 | 0.400 |
| Maher et al. | 2019 | Urothelial | Anti–PD-1 therapy | AEs | 0.514 | 1747 | 0.365 | 0.663 | 0.214 | 0.806 | 0.337 | 0.786 | 0.194 | 0.635 |
| Goodman et al. | 2017 | Multiple cancers | Anti–PD-1 + anti-CTLA4 therapy | TMB | 0.745 | 63 | 0.667 | 0.824 | 0.471 | 0.913 | 0.176 | 0.529 | 0.087 | 0.333 |
| Goodman et al. | 2017 | Multiple cancers | Anti–PD-1 therapy | TMB | 0.758 | 47 | 0.917 | 0.600 | 0.440 | 0.955 | 0.400 | 0.560 | 0.045 | 0.083 |
| Goodman et al. | 2017 | NSCLC | Anti–PD-1 therapy | TMB | 0.756 | 36 | 0.857 | 0.655 | 0.375 | 0.950 | 0.345 | 0.625 | 0.050 | 0.143 |
| Goodman et al. | 2017 | Melanoma | Anti–PD-1 therapy | TMB | 0.717 | 11 | 0.600 | 0.833 | 0.750 | 0.714 | 0.167 | 0.250 | 0.286 | 0.400 |
| Campesato et al. | 2015 | NSCLC | Anti–PD-1 therapy | TMB | 0.746 | 31 | 0.786 | 0.706 | 0.688 | 0.800 | 0.294 | 0.313 | 0.200 | 0.214 |
| Campesato et al. | 2015 | NSCLC | Anti–PD-1 therapy | TMB | 0.746 | 31 | 0.786 | 0.706 | 0.688 | 0.800 | 0.294 | 0.313 | 0.200 | 0.214 |
| Bonta et al. | 2017 | Multiple cancers | Anti–PD-1 + anti-CTLA4 therapy | TMB | 0.764 | 30 | 0.944 | 0.583 | 0.773 | 0.875 | 0.417 | 0.227 | 0.125 | 0.056 |
| Carbone et al. | 2017 | NSCLC | Anti–PD-1 therapy | TMB | 0.611 | 154 | 0.458 | 0.764 | 0.468 | 0.757 | 0.236 | 0.532 | 0.243 | 0.542 |
| Carbone et al. | 2017 | NSCLC | Anti–PD-1 therapy | Multimodal | 0.610 | 158 | 0.255 | 0.964 | 0.750 | 0.754 | 0.036 | 0.250 | 0.246 | 0.745 |
| Gandara et al. | 2019 | NSCLC | Anti–PD-1 therapy | TMB | 0.523 | 583 | 0.312 | 0.735 | 0.152 | 0.875 | 0.265 | 0.848 | 0.125 | 0.688 |
| Johnson et al. | 2016 | Melanoma | Anti–PD-1 therapy | TMB | 0.799 | 65 | 0.719 | 0.879 | 0.852 | 0.763 | 0.121 | 0.148 | 0.237 | 0.281 |
| Johnson et al. | 2016 | Melanoma | Anti–PD-1 therapy | TMB | 0.766 | 32 | 0.643 | 0.889 | 0.818 | 0.762 | 0.111 | 0.182 | 0.238 | 0.357 |
| Johnson et al. | 2016 | Melanoma | Anti–PD-1 therapy | TMB | 0.822 | 33 | 0.778 | 0.867 | 0.875 | 0.765 | 0.133 | 0.125 | 0.235 | 0.222 |
| Singal et al. | 2017 | NSCLC | Anti–PD-1 +anti-CTLA4 therapy | TMB | 0.614 | 33 | 0.227 | 1.000 | 1.000 | 0.393 | 0.000 | 0.000 | 0.607 | 0.773 |
| Hellmann et al. | 2018 | SCLC | Anti–PD-1 + anti-CTLA4 therapy | TMB | 0.648 | 78 | 0.545 | 0.750 | 0.462 | 0.808 | 0.250 | 0.538 | 0.192 | 0.455 |
| Hellmann et al. | 2018 | SCLC | Anti–PD-1 therapy | TMB | 0.677 | 133 | 0.667 | 0.686 | 0.213 | 0.942 | 0.314 | 0.787 | 0.058 | 0.333 |
| Hellmann et al. | 2018 | NSCLC | Anti–PD-1 + anti-CTLA4 therapy | TMB | 0.719 | 75 | 0.792 | 0.647 | 0.514 | 0.868 | 0.353 | 0.486 | 0.132 | 0.208 |
| Hellmann et al. | 2018 | NSCLC | Anti–PD-1 + anti–CTLA4 therapy | Multimodal | 0.730 | 70 | 0.652 | 0.809 | 0.625 | 0.826 | 0.191 | 0.375 | 0.174 | 0.348 |
| Ready et al. | 2019 | NSCLC | Anti–PD-1 therapy | TMB | 0.675 | 90 | 0.778 | 0.571 | 0.438 | 0.857 | 0.429 | 0.563 | 0.143 | 0.222 |
| Socinski et al. | 2018 | NSCLC | Anti–PD-1 therapy + chemo | TGS | 0.584 | 319 | 0.473 | 0.695 | 0.785 | 0.359 | 0.305 | 0.215 | 0.641 | 0.527 |
| Tykodi et al. | 2019 | RCC | Anti–PD-1 therapy | IMDC | 0.435 | 110 | 0.302 | 0.567 | 0.310 | 0.559 | 0.433 | 0.690 | 0.441 | 0.698 |
| Motzer et al. | 2019 | RCC | Anti–PD-1 therapy | IMDC | 0.571 | 437 | 0.284 | 0.858 | 0.681 | 0.531 | 0.142 | 0.319 | 0.469 | 0.716 |
| McDermott et al. | 2019 | RCC | Anti–PD-1 therapy | TGS | 0.520 | 86 | 0.559 | 0.481 | 0.413 | 0.625 | 0.519 | 0.587 | 0.375 | 0.441 |
| McDermott et al. | 2019 | RCC | Anti–PD-1 therapy + bev | TGS | 0.618 | 88 | 0.588 | 0.649 | 0.698 | 0.533 | 0.351 | 0.302 | 0.467 | 0.412 |
| McDermott et al. | 2019 | RCC | Anti–PD-1 therapy + bev | TMB | 0.538 | 65 | 0.659 | 0.417 | 0.659 | 0.417 | 0.583 | 0.341 | 0.583 | 0.341 |
| McDermott et al. | 2019 | RCC | Anti–PD-1 therapy + bev | TMB | 0.556 | 65 | 0.488 | 0.625 | 0.690 | 0.417 | 0.375 | 0.310 | 0.583 | 0.512 |
| McDermott et al. | 2019 | RCC | Anti–PD-1 therapy + bev | TMB | 0.532 | 65 | 0.146 | 0.917 | 0.750 | 0.386 | 0.083 | 0.250 | 0.614 | 0.854 |
| McDermott et al. | 2019 | RCC | Anti–PD-1 therapy | TMB | 0.620 | 71 | 0.708 | 0.532 | 0.436 | 0.781 | 0.468 | 0.564 | 0.219 | 0.292 |
| McDermott et al. | 2019 | RCC | Anti–PD-1 therapy | TMB | 0.602 | 71 | 0.417 | 0.787 | 0.500 | 0.725 | 0.213 | 0.500 | 0.275 | 0.583 |
| McDermott et al. | 2019 | RCC | Anti–PD-1 therapy | TMB | 0.557 | 71 | 0.625 | 0.489 | 0.385 | 0.719 | 0.511 | 0.615 | 0.281 | 0.375 |
| Tumeh et al. | 2014 | Melanoma | Anti–PD-1 therapy | mIHC/IF | 0.833 | 15 | 1.000 | 0.667 | 0.818 | 1.000 | 0.333 | 0.182 | 0.000 | 0.000 |
| Cristescu et al. | 2018 | Multiple cancers | Anti–PD-1 therapy | Multimodal | 0.725 | 113 | 0.625 | 0.825 | 0.370 | 0.930 | 0.175 | 0.630 | 0.070 | 0.375 |
| Cristescu et al. | 2018 | Melanoma | Anti–PD-1 therapy | Multimodal | 0.634 | 86 | 0.684 | 0.583 | 0.565 | 0.700 | 0.417 | 0.435 | 0.300 | 0.316 |
| Cristescu et al. | 2018 | Head and neck | Anti–PD-1 therapy | Multimodal | 0.690 | 105 | 0.667 | 0.714 | 0.368 | 0.896 | 0.286 | 0.632 | 0.104 | 0.333 |
| Cristescu et al. | 2018 | Multiple cancers | Anti–PD-1 therapy | TMB | 0.715 | 113 | 0.688 | 0.742 | 0.306 | 0.935 | 0.258 | 0.694 | 0.065 | 0.313 |
| Cristescu et al. | 2018 | Melanoma | Anti–PD-1 therapy | TMB | 0.627 | 86 | 0.816 | 0.438 | 0.534 | 0.750 | 0.563 | 0.466 | 0.250 | 0.184 |
| Cristescu et al. | 2018 | Head and neck | Anti–PD-1 therapy | TMB | 0.631 | 105 | 0.714 | 0.548 | 0.283 | 0.885 | 0.452 | 0.717 | 0.115 | 0.286 |
| Cristescu et al. | 2018 | Multiple cancers | Anti–PD-1 therapy | TGS | 0.696 | 113 | 0.938 | 0.454 | 0.221 | 0.978 | 0.546 | 0.779 | 0.022 | 0.063 |
| Cristescu et al. | 2018 | Melanoma | Anti–PD-1 therapy | TGS | 0.598 | 86 | 0.842 | 0.354 | 0.508 | 0.739 | 0.646 | 0.492 | 0.261 | 0.158 |
| Cristescu et al. | 2018 | Head and neck | Anti–PD-1 therapy | TGS | 0.649 | 105 | 0.952 | 0.345 | 0.267 | 0.967 | 0.655 | 0.733 | 0.033 | 0.048 |
| Cristescu et al. | 2018 | Multiple cancers | Anti–PD-1 therapy | Multimodal | 0.789 | 74 | 0.778 | 0.800 | 0.350 | 0.963 | 0.200 | 0.650 | 0.037 | 0.222 |
| Cristescu et al. | 2018 | Melanoma | Anti–PD-1 therapy | Multimodal | 0.663 | 89 | 0.737 | 0.588 | 0.571 | 0.750 | 0.412 | 0.429 | 0.250 | 0.263 |
| Cristescu et al. | 2018 | Head and neck | Anti–PD-1 therapy | Multimodal | 0.641 | 107 | 0.667 | 0.616 | 0.298 | 0.883 | 0.384 | 0.702 | 0.117 | 0.333 |
| Johnson et al. | 2018 | Melanoma | Anti–PD-1 therapy | mIHC/IF | 0.569 | 21 | 0.583 | 0.556 | 0.636 | 0.500 | 0.444 | 0.364 | 0.500 | 0.417 |
| Johnson et al. | 2018 | Melanoma | Anti–PD-1 therapy | Multimodal | 0.755 | 24 | 0.692 | 0.818 | 0.818 | 0.692 | 0.182 | 0.182 | 0.308 | 0.308 |
| Johnson et al. | 2018 | Melanoma | Anti–PD-1 therapy | mIHC/IF | 0.871 | 24 | 0.923 | 0.818 | 0.857 | 0.900 | 0.182 | 0.143 | 0.100 | 0.077 |
| Johnson et al. | 2018 | Melanoma | Anti–PD-1 therapy | mIHC/IF | 0.574 | 141 | 0.351 | 0.797 | 0.675 | 0.505 | 0.203 | 0.325 | 0.495 | 0.649 |
| Johnson et al. | 2018 | Melanoma | Anti–PD-1 therapy | Multimodal | 0.585 | 142 | 0.513 | 0.656 | 0.645 | 0.525 | 0.344 | 0.355 | 0.475 | 0.487 |
| Johnson et al. | 2018 | Melanoma | Anti–PD-1 therapy | mIHC/IF | 0.610 | 142 | 0.705 | 0.516 | 0.640 | 0.589 | 0.484 | 0.360 | 0.411 | 0.295 |
| Giraldo et al. | 2018 | MCC | Anti–PD-1 therapy | CD8 | 0.656 | 23 | 0.313 | 1.000 | 1.000 | 0.389 | 0.000 | 0.000 | 0.611 | 0.688 |
| Giraldo et al. | 2018 | MCC | Anti–PD-1 therapy | mIHC/IF | 0.833 | 16 | 1.000 | 0.667 | 0.833 | 1.000 | 0.333 | 0.167 | 0.000 | 0.000 |
| Giraldo et al. | 2018 | MCC | Anti–PD-1 therapy | mIHC/IF | 0.798 | 20 | 0.929 | 0.667 | 0.867 | 0.800 | 0.333 | 0.133 | 0.200 | 0.071 |
| Riaz et al. | 2017 | Melanoma | Anti–PD-1 therapy | TMB | 0.533 | 65 | 0.667 | 0.400 | 0.250 | 0.800 | 0.600 | 0.750 | 0.200 | 0.333 |
| Wang et al. | 2018 | Urothelial | Anti–PD-1 therapy | CD8 | 0.612 | 214 | 0.673 | 0.552 | 0.308 | 0.850 | 0.448 | 0.692 | 0.150 | 0.327 |
| Wang et al. | 2018 | Urothelial | Anti–PD-1 therapy | TGS | 0.507 | 214 | 0.510 | 0.503 | 0.234 | 0.776 | 0.497 | 0.766 | 0.224 | 0.490 |
| Matson et al. | 2018 | Melanoma | Anti–PD-1 therapy | MB | 0.969 | 42 | 0.938 | 1.000 | 1.000 | 0.963 | 0.000 | 0.000 | 0.037 | 0.063 |
| Routy et al. | 2018 | Multiple cancers | Anti–PD-1 therapy | MB | 0.563 | 100 | 0.224 | 0.902 | 0.688 | 0.548 | 0.098 | 0.313 | 0.452 | 0.776 |
| Gopalakrishnan. | 2018 | Melanoma | Anti–PD-1 therapy | MB | 0.683 | 43 | 0.367 | 1.000 | 1.000 | 0.406 | 0.000 | 0.000 | 0.594 | 0.633 |
| Gopalakrishnan. | 2018 | Melanoma | Anti–PD-1 therapy | MB | 0.540 | 86 | 0.404 | 0.676 | 0.656 | 0.426 | 0.324 | 0.344 | 0.574 | 0.596 |
| Rizvi et al. | 2020 | NSCLC | Anti–PD-1 therapy | TMB | 0.552 | 286 | 0.348 | 0.755 | 0.299 | 0.794 | 0.245 | 0.701 | 0.206 | 0.652 |
| Rizvi et al. | 2020 | NSCLC | Anti–PD-1 + anti-CTLA4 therapy | TMB | 0.657 | 268 | 0.477 | 0.837 | 0.484 | 0.833 | 0.163 | 0.516 | 0.167 | 0.523 |
| Kato et al. | 2020 | Esophageal | Anti–PD-1 therapy | CD8 | 0.464 | 18 | 0.500 | 0.429 | 0.200 | 0.750 | 0.571 | 0.800 | 0.250 | 0.500 |

AE, adverse event; bev, bevacizumab; chemo, chemotherapy; FDR, false discovery rate; FNR, false negative rate; FOR, false omission rate; FPR, false positive rate; GEJ, gastroesophageal junction; HCC, hepatocellular carcinoma; IHC, immunohistochemistry; IMDC, International Metastatic RCC Database Consortium Risk Score; MB, microbiome signature; MCC, Merkel cell carcinoma; MEK, MEK inhibitors; mIHC/IF, fluorescent multiplex IHC; NPV, negative predictive value; NSCLC, non–small cell lung cancer; PPV, positive predictive value; RCC, renal cell carcinoma; SCLC, small cell lung cancer; TGS, T-cell–related gene signature; TMB, tumor mutational burden.