**SUPPLEMENTARY TABLE**

**Supplementary Table 1. Outcomes of KidneyCare in Renal Allografts (OKRA) Inclusion and Exclusion criteria.**

|  |  |
| --- | --- |
| **Inclusion Criteria** | **Exclusion Criteria** |
| Patient's health care provider adopts and intends to apply the center's AlloSure Routine Testing Schedule as part of the information used to manage the patient. | Exclusions for AlloSure® Intended Use |
| Subjects willing to provide written informed consent to participate. | Specimens from patients for whom any of the following are true will not be tested: |
|  | Recipients of transplanted organs other than kidney |
|  | Recipients of a transplant from a monozygotic (identical) |
|  | Recipients of a bone marrow transplant |
|  | Recipients who are pregnant |
|  | Recipients who are under the age of 18 |
|  | Recipients who are less than 14 days post-transplant |

**Supplementary Table 2.** **Molecular Tag (MT) Counts for the AlloMap Kidney Gene Signature across RNA Input Amounts.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **AMK Gene** | **RNA Input**  **(ng)** | **MT count (Rep. 1)** | **MT count**  **(Rep. 2)** | **MT count**  **(Rep. 3)** | **MT count (Mean)** | **SD** | **%CV** |
| DCAF12 | 80 | 56,115 | 54,038 | 56,735 | 55,629.33 | 1,153.36 | 2.07 |
| DCAF12 | 60 | 41,213 | 40,959 | 39,541 | 40,571.00 | 735.66 | 1.81 |
| DCAF12 | 40 | 28,737 | 27,787 | 28,249 | 28,257.67 | 387.88 | 1.37 |
| DCAF12 | 32 | 23,652 | 22,014 | 23,123 | 22,929.67 | 682.54 | 2.98 |
| DCAF12 | 24 | 17,005 | 18,037 | 17,403 | 17,481.67 | 424.97 | 2.43 |
| DCAF12 | 20 | 16,057 | 14,883 | 14,961 | 15,300.33 | 535.99 | 3.50 |
| DECR1 | 80 | 5,743 | 5,548 | 5,832 | 5,707.67 | 118.60 | 2.08 |
| DECR1 | 60 | 4,287 | 4,130 | 4,005 | 4,140.67 | 115.37 | 2.79 |
| DECR1 | 40 | 2,989 | 2,875 | 2,869 | 2,911.00 | 55.21 | 1.90 |
| DECR1 | 32 | 2,425 | 2,289 | 2,385 | 2,366.33 | 57.07 | 2.41 |
| DECR1 | 24 | 1,687 | 1,796 | 1,843 | 1,775.33 | 65.34 | 3.68 |
| DECR1 | 20 | 1,627 | 1,407 | 1,485 | 1,506.33 | 91.07 | 6.05 |
| EWSR1 | 80 | 5,110 | 4,721 | 5,049 | 4,960.00 | 170.82 | 3.44 |
| EWSR1 | 60 | 3,525 | 3,553 | 3,490 | 3,522.67 | 25.77 | 0.73 |
| EWSR1 | 40 | 2,391 | 2,421 | 2,514 | 2,442.00 | 52.36 | 2.14 |
| EWSR1 | 32 | 2,035 | 1,826 | 1,961 | 1,940.67 | 86.53 | 4.46 |
| EWSR1 | 24 | 1,309 | 1,394 | 1,488 | 1,397.00 | 73.11 | 5.23 |
| EWSR1 | 20 | 1,346 | 1,182 | 1,189 | 1,239.00 | 75.71 | 6.11 |
| FLT3 | 80 | 164 | 134 | 153 | 150.33 | 12.39 | 8.24 |
| FLT3 | 60 | 90 | 102 | 91 | 94.33 | 5.44 | 5.76 |
| FLT3 | 40 | 90 | 75 | 69 | 78.00 | 8.83 | 11.32 |
| FLT3 | 32 | 58 | 59 | 53 | 56.67 | 2.62 | 4.63 |
| FLT3 | 24 | 46 | 34 | 39 | 39.67 | 4.92 | 12.41 |
| FLT3 | 20 | 30 | 35 | 39 | 34.67 | 3.68 | 10.62 |
| GABPB2 | 80 | 2,930 | 2,865 | 3,079 | 2,958.00 | 89.58 | 3.03 |
| GABPB2 | 60 | 2,142 | 2,032 | 2,126 | 2,100.00 | 48.52 | 2.31 |
| GABPB2 | 40 | 1,428 | 1,429 | 1,462 | 1,439.67 | 15.80 | 1.10 |
| GABPB2 | 32 | 1,150 | 1,096 | 1,200 | 1,148.67 | 42.47 | 3.70 |
| GABPB2 | 24 | 871 | 896 | 873 | 880.00 | 11.34 | 1.29 |
| GABPB2 | 20 | 820 | 707 | 714 | 747.00 | 51.70 | 6.92 |
| GAPDH | 80 | 382 | 325 | 360 | 355.67 | 23.47 | 6.60 |
| GAPDH | 60 | 266 | 242 | 278 | 262.00 | 14.97 | 5.71 |
| GAPDH | 40 | 171 | 192 | 166 | 176.33 | 11.26 | 6.39 |
| GAPDH | 32 | 115 | 133 | 146 | 131.33 | 12.71 | 9.68 |
| GAPDH | 24 | 95 | 105 | 93 | 97.67 | 5.25 | 5.37 |
| GAPDH | 20 | 107 | 72 | 59 | 79.33 | 20.27 | 25.55 |
| GUSB | 80 | 1,381 | 1,292 | 1,456 | 1,376.33 | 67.03 | 4.87 |
| GUSB | 60 | 1,108 | 958 | 965 | 1,010.33 | 69.12 | 6.84 |
| GUSB | 40 | 737 | 721 | 770 | 742.67 | 20.40 | 2.75 |
| GUSB | 32 | 608 | 541 | 597 | 582.00 | 29.34 | 5.04 |
| GUSB | 24 | 417 | 397 | 487 | 433.67 | 38.59 | 8.90 |
| GUSB | 20 | 421 | 364 | 355 | 380.00 | 29.22 | 7.69 |
| HSP90AB1 | 80 | 10,048 | 9,397 | 9,872 | 9,772.33 | 274.95 | 2.81 |
| HSP90AB1 | 60 | 6,949 | 6,905 | 6,837 | 6,897.00 | 46.07 | 0.67 |
| HSP90AB1 | 40 | 4,793 | 4,816 | 4,844 | 4,817.67 | 20.85 | 0.43 |
| HSP90AB1 | 32 | 4,052 | 3,566 | 3,916 | 3,844.67 | 204.72 | 5.32 |
| HSP90AB1 | 24 | 2,707 | 2,988 | 2,922 | 2,872.33 | 119.97 | 4.18 |
| HSP90AB1 | 20 | 2,640 | 2,320 | 2,364 | 2,441.33 | 141.62 | 5.80 |
| IL1R2 | 80 | 4,358 | 4,229 | 4,480 | 4,355.67 | 102.48 | 2.35 |
| IL1R2 | 60 | 3,014 | 3,048 | 2,891 | 2,984.33 | 67.44 | 2.26 |
| IL1R2 | 40 | 2,119 | 1,991 | 2,083 | 2,064.33 | 53.90 | 2.61 |
| IL1R2 | 32 | 1,673 | 1,588 | 1,679 | 1,646.67 | 41.56 | 2.52 |
| IL1R2 | 24 | 1,095 | 1,302 | 1,256 | 1,217.67 | 88.75 | 7.29 |
| IL1R2 | 20 | 1,140 | 964 | 1,028 | 1,044.00 | 72.74 | 6.97 |
| MAP3K3 | 80 | 8,068 | 7,053 | 7,831 | 7,650.67 | 433.55 | 5.67 |
| MAP3K3 | 60 | 5,793 | 5,525 | 5,480 | 5,599.33 | 138.17 | 2.47 |
| MAP3K3 | 40 | 4,097 | 3,975 | 4,081 | 4,051.00 | 54.14 | 1.34 |
| MAP3K3 | 32 | 3,409 | 3,108 | 3,315 | 3,277.33 | 125.74 | 3.84 |
| MAP3K3 | 24 | 2,324 | 2,667 | 2,529 | 2,506.67 | 140.92 | 5.62 |
| MAP3K3 | 20 | 2,319 | 1,999 | 2,023 | 2,113.67 | 145.52 | 6.88 |
| MAPK9 | 80 | 2,681 | 2,510 | 2,636 | 2,609.00 | 72.37 | 2.77 |
| MAPK9 | 60 | 1,850 | 1,957 | 1,761 | 1,856.00 | 80.13 | 4.32 |
| MAPK9 | 40 | 1,279 | 1,238 | 1,255 | 1,257.33 | 16.82 | 1.34 |
| MAPK9 | 32 | 1,057 | 994 | 1,009 | 1,020.00 | 26.87 | 2.63 |
| MAPK9 | 24 | 702 | 756 | 764 | 740.67 | 27.54 | 3.72 |
| MAPK9 | 20 | 666 | 631 | 639 | 645.33 | 14.97 | 2.32 |
| NONO | 80 | 10,094 | 9,611 | 10,201 | 9,968.67 | 256.65 | 2.57 |
| NONO | 60 | 7,122 | 7,112 | 6,987 | 7,073.67 | 61.42 | 0.87 |
| NONO | 40 | 4,961 | 4,942 | 4,900 | 4,934.33 | 25.49 | 0.52 |
| NONO | 32 | 4,040 | 3,794 | 3,850 | 3,894.67 | 105.28 | 2.70 |
| NONO | 24 | 2,803 | 2,906 | 2,890 | 2,866.33 | 45.26 | 1.58 |
| NONO | 20 | 2,580 | 2,325 | 2,337 | 2,414.00 | 117.48 | 4.87 |
| PDCD1 | 80 | 101 | 109 | 103 | 104.33 | 3.40 | 3.26 |
| PDCD1 | 60 | 76 | 59 | 71 | 68.67 | 7.13 | 10.39 |
| PDCD1 | 40 | 62 | 55 | 45 | 54.00 | 6.98 | 12.92 |
| PDCD1 | 32 | 53 | 50 | 42 | 48.33 | 4.64 | 9.61 |
| PDCD1 | 24 | 35 | 31 | 32 | 32.67 | 1.70 | 5.20 |
| PDCD1 | 20 | 35 | 31 | 37 | 34.33 | 2.49 | 7.27 |
| RXRB | 80 | 3,590 | 3,446 | 3,548 | 3,528.00 | 60.46 | 1.71 |
| RXRB | 60 | 2,565 | 2,435 | 2,309 | 2,436.33 | 104.52 | 4.29 |
| RXRB | 40 | 1,740 | 1,696 | 1,700 | 1,712.00 | 19.87 | 1.16 |
| RXRB | 32 | 1,463 | 1,291 | 1,289 | 1,347.67 | 81.56 | 6.05 |
| RXRB | 24 | 929 | 1,001 | 993 | 974.33 | 32.22 | 3.31 |
| RXRB | 20 | 888 | 755 | 817 | 820.00 | 54.34 | 6.63 |
| SDHA | 80 | 3,465 | 3,132 | 3,408 | 3,335.00 | 145.42 | 4.36 |
| SDHA | 60 | 2,597 | 2,383 | 2,320 | 2,433.33 | 118.55 | 4.87 |
| SDHA | 40 | 1,820 | 1,761 | 1,729 | 1,770.00 | 37.69 | 2.13 |
| SDHA | 32 | 1,419 | 1,367 | 1,431 | 1,405.67 | 27.78 | 1.98 |
| SDHA | 24 | 1,068 | 1,107 | 1,076 | 1,083.67 | 16.82 | 1.55 |
| SDHA | 20 | 1,018 | 902 | 827 | 915.67 | 78.57 | 8.58 |
| SRRM1 | 80 | 5,032 | 4,715 | 4,972 | 4,906.33 | 137.49 | 2.80 |
| SRRM1 | 60 | 3,523 | 3,488 | 3,437 | 3,482.67 | 35.31 | 1.01 |
| SRRM1 | 40 | 2,330 | 2,305 | 2,337 | 2,324.00 | 13.74 | 0.59 |
| SRRM1 | 32 | 1,955 | 1,756 | 1,923 | 1,878.00 | 87.25 | 4.65 |
| SRRM1 | 24 | 1,407 | 1,339 | 1,367 | 1,371.00 | 27.90 | 2.04 |
| SRRM1 | 20 | 1,293 | 1,126 | 1,167 | 1,195.33 | 71.06 | 5.94 |
| TBC1D10B | 80 | 3,041 | 2,696 | 2,947 | 2,894.67 | 145.63 | 5.03 |
| TBC1D10B | 60 | 2,215 | 2,053 | 2,034 | 2,100.67 | 81.22 | 3.87 |
| TBC1D10B | 40 | 1,573 | 1,520 | 1,589 | 1,560.67 | 29.49 | 1.89 |
| TBC1D10B | 32 | 1,273 | 1,230 | 1,294 | 1,265.67 | 26.64 | 2.10 |
| TBC1D10B | 24 | 853 | 971 | 942 | 922.00 | 50.21 | 5.45 |
| TBC1D10B | 20 | 837 | 768 | 807 | 804.00 | 28.25 | 3.51 |
| TBP | 80 | 1,703 | 1,674 | 1,652 | 1,676.33 | 20.89 | 1.25 |
| TBP | 60 | 1,260 | 1,218 | 1,170 | 1,216.00 | 36.77 | 3.02 |
| TBP | 40 | 828 | 818 | 851 | 832.33 | 13.82 | 1.66 |
| TBP | 32 | 722 | 635 | 666 | 674.33 | 36.00 | 5.34 |
| TBP | 24 | 516 | 511 | 521 | 516.00 | 4.08 | 0.79 |
| TBP | 20 | 505 | 431 | 424 | 453.33 | 36.65 | 8.08 |
| TOP2B | 80 | 7,785 | 7,143 | 7,682 | 7,536.67 | 281.52 | 3.74 |
| TOP2B | 60 | 5,614 | 5,357 | 5,421 | 5,464.00 | 109.24 | 2.00 |
| TOP2B | 40 | 3,819 | 3,757 | 3,912 | 3,829.33 | 63.70 | 1.66 |
| TOP2B | 32 | 3,267 | 2,974 | 3,204 | 3,148.33 | 125.93 | 4.00 |
| TOP2B | 24 | 2,259 | 2,370 | 2,455 | 2,361.33 | 80.25 | 3.40 |
| TOP2B | 20 | 2,163 | 1,820 | 1,855 | 1,946.00 | 154.11 | 7.92 |
| MARCH8 | 80 | 35,431 | 34,434 | 36,147 | 35,337.33 | 702.46 | 1.99 |
| MARCH8 | 60 | 25,530 | 25,407 | 24,544 | 25,160.33 | 438.70 | 1.74 |
| MARCH8 | 40 | 17,746 | 17,507 | 17,325 | 17,526.00 | 172.40 | 0.98 |
| MARCH8 | 32 | 14,515 | 13,511 | 14,253 | 14,093.00 | 425.21 | 3.02 |
| MARCH8 | 24 | 10,328 | 10,920 | 10,603 | 10,617.00 | 241.89 | 2.28 |
| MARCH8 | 20 | 9,685 | 8,640 | 8,681 | 9,002.00 | 483.24 | 5.37 |

**Supplementary Table 3. Simple Linear Regression Analysis Results for AlloMap Kidney Genes.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Genes** | **RNA** | **Estimate** | ***p*-value** | **Coefficient of**  **Determination**  **(R2)** |
| DCAF12 | Intercept | 1,550.35 | 0.06 | 0.9986 |
|  | RNA\_input\_ng | 667.45 | 0 |  |
| DECR1 | Intercept | 126.52 | 0.132 | 0.9983 |
|  | RNA\_input\_ng | 68.94 | 0 |  |
| EWSR1 | Intercept | -43.68 | 0.595 | 0.9973 |
|  | RNA\_input\_ng | 61.58 | 0 |  |
| FLT3 | Intercept | -2.62 | 0.745 | 0.9712 |
|  | RNA\_input\_ng | 1.83 | 0 |  |
| GABPB2 | Intercept | -6.35 | 0.896 | 0.9973 |
|  | RNA\_input\_ng | 36.37 | 0 |  |
| GAPDH | Intercept | -12.73 | 0.01 | 0.9993 |
|  | RNA\_input\_ng | 4.6 | 0 |  |
| GUSB | Intercept | 52.99 | 0.068 | 0.9970 |
|  | RNA\_input\_ng | 16.43 | 0 |  |
| HSP90AB1 | Intercept | -17.08 | 0.921 | 0.9968 |
|  | RNA\_input\_ng | 120.11 | 0 |  |
| IL1R2 | Intercept | -90.02 | 0.414 | 0.9941 |
|  | RNA\_input\_ng | 54.11 | 0 |  |
| MAP3K3 | Intercept | 339.73 | 0.026 | 0.9979 |
|  | RNA\_input\_ng | 90.47 | 0 |  |
| MAPK9 | Intercept | -29.93 | 0.467 | 0.9977 |
|  | RNA\_input\_ng | 32.45 | 0 |  |
| MARCH8 | Intercept | 198.99 | 0.723 | 0.9974 |
|  | RNA\_input\_ng | 431.8 | 0 |  |
| NONO | Intercept | -96.51 | 0.544 | 0.9976 |
|  | RNA\_input\_ng | 123.95 | 0 |  |
| PDCD1 | Intercept | 8.64 | 0.161 | 0.9664 |
|  | RNA\_input\_ng | 1.13 | 0 |  |
| RXRB | Intercept | -81.04 | 0.324 | 0.9953 |
|  | RNA\_input\_ng | 44.16 | 0 |  |
| SDHA | Intercept | 134.85 | 0.041 | 0.9977 |
|  | RNA\_input\_ng | 39.59 | 0 |  |
| SRRM1 | Intercept | -97.21 | 0.249 | 0.9976 |
|  | RNA\_input\_ng | 61.49 | 0 |  |
| TBC1D10B | Intercept | 134.99 | 0.068 | 0.9955 |
|  | RNA\_input\_ng | 34.13 | 0 |  |
| TBP | Intercept | 28.74 | 0.228 | 0.9982 |
|  | RNA\_input\_ng | 20.3 | 0 |  |
| TOP2B | Intercept | 157.62 | 0.168 | 0.9981 |
|  | RNA\_input\_ng | 91.17 | 0 |  |

**Supplementary Table 4. Quadratic Polynomial Regression Analysis Results for AMK Genes.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Genes** | **RNA** | **Estimate** | ***p*-value** | **Coefficient of Determination (R2)** |
| DCAF12 | Intercept | 3,866.65 | 0.053 | 0.9994 |
| RNA\_input\_ng | 550.94 | 0.003 |
| RNAsq | 1.17 | 0.140 |
| DECR1 | Intercept | 290.04 | 0.219 | 0.9987 |
| RNA\_input\_ng | 60.71 | 0.006 |
| RNAsq | 0.08 | 0.418 |
| EWSR1 | Intercept | 195.32 | 0.380 | 0.9983 |
| RNA\_input\_ng | 49.55 | 0.012 |
| RNAsq | 0.12 | 0.271 |
| FLT3 | Intercept | 10.51 | 0.672 | 0.9746 |
| RNA\_input\_ng | 1.17 | 0.352 |
| RNAsq | 0.01 | 0.575 |
| GABPB2 | Intercept | 191.24 | 0.089 | 0.9992 |
| RNA\_input\_ng | 26.43 | 0.005 |
| RNAsq | 0.10 | 0.070 |
| GAPDH | Intercept | -14.91 | 0.189 | 0.9994 |
| RNA\_input\_ng | 4.71 | 0.001 |
| RNAsq | -0.00 | 0.807 |
| GUSB | Intercept | 48.38 | 0.526 | 0.9970 |
| RNA\_input\_ng | 16.67 | 0.014 |
| RNAsq | -0.00 | 0.946 |
| HSP90AB1 | Intercept | 540.14 | 0.249 | 0.9983 |
| RNA\_input\_ng | 92.08 | 0.014 |
| RNAsq | 0.28 | 0.212 |
| IL1R2 | Intercept | 307.88 | 0.213 | 0.9977 |
| RNA\_input\_ng | 34.10 | 0.035 |
| RNAsq | 0.20 | 0.117 |
| MAP3K3 | Intercept | 445.05 | 0.241 | 0.9980 |
| RNA\_input\_ng | 85.17 | 0.010 |
| RNAsq | 0.05 | 0.736 |
| MAPK9 | Intercept | 119.34 | 0.207 | 0.9991 |
| RNA\_input\_ng | 24.94 | 0.006 |
| RNAsq | 0.08 | 0.120 |
| MARCH8 | Intercept | 2,053.00 | 0.186 | 0.9987 |
| RNA\_input\_ng | 338.54 | 0.010 |
| RNAsq | 0.94 | 0.196 |
| NONO | Intercept | 307.91 | 0.488 | 0.9983 |
| RNA\_input\_ng | 103.61 | 0.011 |
| RNAsq | 0.20 | 0.347 |
| PDCD1 | Intercept | 23.42 | 0.173 | 0.9774 |
| RNA\_input\_ng | 0.39 | 0.575 |
| RNAsq | 0.01 | 0.314 |
| RXRB | Intercept | 134.24 | 0.524 | 0.9969 |
| RNA\_input\_ng | 33.33 | 0.033 |
| RNAsq | 0.11 | 0.304 |
| SDHA | Intercept | 185.61 | 0.281 | 0.9978 |
| RNA\_input\_ng | 37.03 | 0.012 |
| RNAsq | 0.03 | 0.726 |
| SRRM1 | Intercept | 228.08 | 0.130 | 0.9994 |
| RNA\_input\_ng | 45.12 | 0.003 |
| RNAsq | 0.16 | 0.050 |
| TBC1D10B | Intercept | 142.05 | 0.471 | 0.9955 |
| RNA\_input\_ng | 33.78 | 0.026 |
| RNAsq | 0.00 | 0.968 |
| TBP | Intercept | 122.49 | 0.021 | 0.9997 |
| RNA\_input\_ng | 15.58 | 0.001 |
| RNAsq | 0.05 | 0.036 |
| TOP2B | Intercept | 342.60 | 0.302 | 0.9984 |
| RNA\_input\_ng | 81.87 | 0.008 |
| RNAsq | 0.09 | 0.523 |

**Supplementary Table 5. Summary of the prospective, multi-center cohort.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Specimens** | | | |
| Total specimens screened | 332 | | |
| Histologically determined non-rejections | 169 | | |
| Histologically determined rejections | 66 | | |
| Indeterminate rejection status | 97 | | |
|  | **Number of specimens** | | |
| **Cohort** | ABMR + mixed | TCMR | Non-rejection |
| OKRA + Cornell | 21 | 16 | 65 |
| Montefiore | 4 | 7 | 8 |
| DART | 11 | 7 | 96 |

**Supplementary Table 6. Prospective, multi-center cohort categorized by biopsy type and study cohort.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cohort** | **Biopsy** | | | **Total** |
| **Surveillance** | **For-cause** | **Not recorded** |
| OKRA+Cornell | 24 | 78 | 0 | 102 |
| Montefiore | 0 | 19 | 0 | 19 |
| DART | 29 | 63 | 22 | 114 |
|  | | | | 235 |