**Table ST1**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Protein** | **Substrate** | ***KM* (mM)** | ***kcat* (s-1)** | ***kcat*/*KM* (s-1M-1) x 106** | **Temp. (K)** | **Ref.** |
| bRNaseA | UpA | 0.20 ± 0.06 | 347 ± 40 | 1.7 ± 0.3 | 298 | 10 |
| bRNaseA | UpA | 0.33 | 1920 | 5.8 | 298 | 11 |
| bRNaseA | UpA | 0.62 ± 0.09 | 1400 ± 150 | 2.3 ± 0.4 | 298 | 12 |
| bRNaseA | UpA | 0.7 | 2690 | 3.0 ± 0.1 | 298 | 13 |
| bRNaseA | CpA | 0.5 | 2300 | 6.4 ± 0.7 | 298 |  13 |
| bRNaseA | C > p | 1.06±0.1 | 2.28±0.18 | 0.00215 | 298 | 9 |
| bRNaseA | Poly(C) | 0.047 ± 0.011 | 190 ± 11 | 4.0 ± 1.0 | 283 | 14 |
| bRNaseA | Poly(C) | 0.089 ± 0.009 | 507 ± 15 | 5.7 ± 0.5 | 298 | 10 |
| bRNaseA | Poly(C) | 0.0331 ± 2.6 | 368.0 ± 11.0 | 11.2 ± 0.6 |  | 15 |
| bRNaseA | Poly(U) | 0.06 | 24 | 0.4 | 298 | 11 |
| bRNaseA | Poly(C) | 0.034 | 510 | 15 | 298 | 11 |
| bRNaseA | Poly(U) | 0.06 ± 0.01 | 24 ± 15 | 0.4 ± 0.3 | 298 | 12 |
| bRNaseA | Poly(C) | 0.034 ± 0.002 | 510 ± 10 | 15 ± 1 | 298 | 12 |
| bRNaseA | Poly(A) | 0.080 ± 0.009 | 0.023 ± 0.001 | 0.00028 ± 0.00004 | 298 | 12 |
|  |  |
| hRNase1 | Poly(C) | 0.10 ± 0.013 | 2416.67 ± 33.3 | 1.48 ± 0.11 | 310 | 16 |
| hRNase1 | tRNA | 4.0 | 64.8 | 0.0.162 |  | 17 |
|  |  |
| hRNase2 | tRNA | 0.0007 | 0.91 | 0.13 |  | 18 |
| hRNase2 | tRNA | 0.00336 ± 0.00015 | 31.37 ± 0.96 | 9.34 ± 0.17 |  | 19 |
| hRNase2 | tRNA | 0.0128 | 3.7 | 3.2 | 310 | 20 |
| hRNase2 | Poly(U) | 80 ± 7 | 190 ± 11 |  |  | 19 |
| hRNase2 | tRNA | 2.5 ± 0.21 | 20 ± 0.65 |  |  |  19 |
| hRNase2 | tRNA | 0.0036 ± 0.00015 | 31.37 ± 0.96 | 9.34 ± 0.17 |  | 21 |
| hRNase2 | Poly(U) | 53.05 ± 4.04 | 1248.93 ± 12.10 | 4.79 ± 0.52 |  | 21 |
|  |  |
| hRNase3 | CpA | 1.7±0.3 | 0.55±0.06 | 0.000323 | 298 | 9 |
| hRNase3 | UpA | 2.7±0.66 | 1.22±0.12 | 0.000447 | 298 | 9 |
| hRNase3 | C > p | 3±0.53 | 0.0032±0.00051 | 1.07×10−6 | 298 | 9 |
| hRNase3 | C > p | 1.5 | 0.014 | 0.000011 | 298 | 22 |
| hRNase3 | U > p | 1.0 | 0.0043 | 0.000004 | 298 | 22  |
| hRNase3 | CpA | 2.4 | 4.2 | 0.001750 | 298 | 22  |
| hRNase3 | UpA | 5.4 | 6.2 | 0.001150 | 298 |  22 |
| hRNase3 | (Up)2 U > p | 1.4 | 0.56 | 0.000400 | 298 |  22 |
| hRNase3 | (Up)3 U > p | 0.7 | 1.2 | 0.001714 | 298 | 22  |
| hRNase3 | (Up)4 U > p | 0.17 | 1.4 | 0.008235 | 298 |  22 |
| hRNase3 | ytRNA | 0.0041 | 0.0024 | 0.000590 | 298 | 22  |
| hRNase3 | Poly(U) | 253 ± 10 | 36 ± 0.4 | 0.00014 ± 0.000005 |  | 23 |
|  |  |
| hRNase4 | UpA |  |  | 0.25 | 298 | 24 |
| hRNase4 | CpA |  |  | 0.00066 |  |  |
|  |  |
| hRNase5 | CpA |  |  | 0.0000122 ± 0.0000002 | 298 | 25,26 |
| hRNase5 | CpG |  |  | 0.000004 ± 0.0000001 | 298 | 25,26 |
| hRNase5 | CpC |  |  | 0.0000013 ± 0.0000001 | 298 | 25,26 |
| hRNase5 | CpU |  |  | 0.0000006 ± 0.0000001 | 298 | 25,26 |
| hRNase5 | UpA |  |  | 0.0000007 ± 0.0000001 | 298 | 25,26 |
| hRNase5 | UpG |  |  | 0.00000013 ± 0.00000002 | 298 | 25,26 |
| hRNase5 | UpC |  |  | 0.00000006 ± 0.00000001 | 298 | 25,26 |
| hRNase5 | UpU |  |  | 0.000000031 ± 0.000000007 | 298 | 25,26 |
| hRNase5 | pCpA |  |  | 0.000019 ± 0.000001 | 298 | 25,26 |
| hRNase5 | CpAp |  |  | 0.000110 ± 0.000005 | 298 | 25,26 |
| hRNase5 | CpApG |  |  | 0.000055 ± 0.000002 | 298 | 25,26 |
| hRNase5 | CpApA |  |  | 0.000044 ± 0.000002 | 298 | 25,26 |
| hRNase5 | CpApU |  |  | 0.000030 ± 0.000001 | 298 | 25,26 |
| hRNase5 | CpApC |  |  | 0.000021 ± 0.000001 | 298 | 25,26 |
| hRNase5 | CpA |  |  | 0.0000024 ± 0.0000001 | 298 | 25,26 |
| hRNase5 | CpAp |  |  | 0.000017 ± 0.0000001 | 298 | 25,26 |
| hRNase5 | CpApG |  |  | 0.0000117 ± 0.0000003 | 298 | 25,26 |
| hRNase5 | CpA |  |  | 0.0000040 ± 0.0000001 | 298 | 25,26 |
| hRNase5 | CpAp |  |  | 0.000033 ± 0.0000002 | 298 | 25,26 |
| hRNase5 | CpApG |  |  | 0.000016 ± 0.0000004 | 298 | 25,26 |
|  |  |
| hRNase6 | tRNA | 0.005 | 0.13 | 0.000026 | 298 | 9,31 |
| hRNase6 | UpA | 2.63±0.3 | 12.9±1.1 | 0.0049 | 298 | 9 |
| hRNase6 | CpA | 1.22±0.2 | 1.08±0.1 | 0.000885 | 298 | 9 |
| hRNase6 | C>p | 2.06±0.3 | 0.00325 ± 0.06 | 1.6 ×10−6 | 298 | 9 |
|  |  |  |  |  |  |  |
| hRNase7 | ytRNA | 0.0022  | 5.1  | 2.3  | 310 | 27 |
|  |  |  |  |  |  |  |