## S1. The distribution of HRD mutations for each cancer type

| Gene     | Colo-rectal cancer (n=151) | Gastric cancer (n=116) | Sarcoma (n=60) | Biliary tract cancer (n=48) | Pancreatic cancer (n=42) | Genitourinary cancer (n=25) | Other GI cancer (n=22) | Melanoma (n=23) | HCC (n=10) | Rare cancer (n=4) | Total |
|----------|---------------------------|------------------------|---------------|----------------------------|--------------------------|----------------------------|------------------------|----------------|------------|------------------|-------|
| ARID1A   | 24                        | 19                     | 6             | 9                          | 7                        | 4                          | 4                      | 2              | 2          | 0                | 77    |
| ATM      | 25                        | 13                     | 4             | 6                          | 9                        | 4                          | 3                      | 4              | 2          | 1                | 71    |
| ATRX     | 9                         | 3                      | 5             | 2                          | 4                        | 2                          | 0                      | 1              | 0          | 1                | 27    |
| BAP1     | 0                         | 0                      | 0             | 0                          | 0                        | 0                          | 0                      | 1              | 0          | 0                | 1     |
| BARD1    | 24                        | 11                     | 11            | 4                          | 6                        | 5                          | 1                      | 3              | 1          | 1                | 67    |
| BLM      | 16                        | 6                      | 5             | 3                          | 6                        | 3                          | 4                      | 0              | 0          | 0                | 43    |
| BRCA1    | 11                        | 5                      | 3             | 5                          | 3                        | 5                          | 2                      | 3              | 0          | 1                | 38    |
| BRCA2    | 26                        | 20                     | 9             | 14                         | 9                        | 7                          | 3                      | 1              | 1          | 0                | 90    |
| BRIP1    | 5                         | 4                      | 4             | 2                          | 2                        | 2                          | 2                      | 1              | 0          | 0                | 22    |
| CHEK1    | 3                         | 1                      | 0             | 2                          | 0                        | 0                          | 0                      | 0              | 0          | 0                | 6     |
| CHEK2    | 6                         | 6                      | 0             | 1                          | 1                        | 2                          | 0                      | 1              | 1          | 0                | 18    |
| FANCA    | 4                         | 5                      | 1             | 1                          | 0                        | 0                          | 0                      | 0              | 0          | 0                | 11    |
| FANCC    | 7                         | 3                      | 0             | 2                          | 0                        | 2                          | 0                      | 1              | 0          | 0                | 15    |
| FANCD2   | 26                        | 8                      | 6             | 3                          | 2                        | 4                          | 1                      | 0              | 3          | 0                | 53    |
| FANCE    | 3                         | 2                      | 0             | 0                          | 0                        | 1                          | 0                      | 1              | 0          | 0                | 7     |
| FANCF    | 2                         | 0                      | 1             | 1                          | 0                        | 0                          | 0                      | 0              | 0          | 1                | 5     |
| FANCG    | 0                         | 2                      | 0             | 0                          | 0                        | 0                          | 0                      | 0              | 0          | 0                | 2     |
| FANCL    | 2                         | 2                      | 1             | 1                          | 0                        | 1                          | 0                      | 0              | 0          | 0                | 7     |
| MRE11A   | 0                         | 0                      | 0             | 0                          | 0                        | 0                          | 0                      | 0              | 0          | 0                | 0     |
| NBN      | 11                        | 14                     | 5             | 4                          | 1                        | 3                          | 0                      | 0              | 1          | 1                | 40    |
| PALB2    | 13                        | 9                      | 3             | 3                          | 1                        | 2                          | 3                      | 0              | 2          | 0                | 46    |
| PTEN     | 8                         | 3                      | 1             | 2                          | 0                        | 2                          | 0                      | 0              | 0          | 0                | 16    |
| RAD50    | 12                        | 4                      | 1             | 2                          | 1                        | 2                          | 0                      | 1              | 0          | 0                | 23    |
| RAD51    | 6                         | 2                      | 1             | 2                          | 1                        | 0                          | 0                      | 0              | 1          | 0                | 13    |
| RAD51B   | 3                         | 0                      | 2             | 1                          | 0                        | 0                          | 1                      | 0              | 0          | 0                | 7     |
### S2-A HRD and progression status for each cancer type

| Tumor type          | Total (N = 65) | Progression (n) | HRD mutation with progression |
|---------------------|----------------|-----------------|-------------------------------|
| Colorectal cancer   | 4              | 2               | 4                             | 2                            |
| Gastric cancer      | 14             | 12              | 12                            | 10                           |
| Sarcoma             | 3              | 2               | 2                             | 2                            |
| Biliary tract       | 5              | 4               | 5                             | 4                            |
| Pancreatic          | 1              | 1               | 1                             | 1                            |
| Genitourinary       | 12             | 8               | 12                            | 8                            |
| Other GI cancer     | 1              | 1               | 1                             | 1                            |
| Melanoma            | 20             | 14              | 11                            | 8                            |
| Hepatocellular cancer | 4           | 3               | 4                             | 3                            |
| Rare cancer         | 1              | 1               | 1                             | 1                            |

GI gastrointestinal, HRD Homologous recombination deficiency

### S2-B Kaplan-Meier curves for progression-free survival of each cancer type according to HRD status.
GU genitourinary