### Supplementary table S1. Sample overview.

| Samples       | Unique Nucleotide Sequences | Unique Productive Nucleotide Sequences | Total Number of Genomes | Top Productive Sequence* (%) |
|---------------|-----------------------------|----------------------------------------|--------------------------|------------------------------|
| 101 Baseline  | 232310                      | 190095                                 | 415207                   | 0.73                         |
| 101 RT        | 210991                      | 173182                                 | 358653                   | 0.65                         |
| 101 C7        | 195774                      | 160282                                 | 336951                   | 0.79                         |
| 101 C18       | 193498                      | 158083                                 | 314350                   | 0.77                         |
| 102 Baseline  | 385262                      | 319150                                 | 577694                   | 1.17                         |
| 102 RT        | 294720                      | 244919                                 | 453400                   | 0.90                         |
| 102 Progression| 285376                     | 236970                                 | 521904                   | 1.82                         |
| 103 Baseline  | 292365                      | 244259                                 | 501400                   | 6.15                         |
| 103 RT        | 229655                      | 185391                                 | 364226                   | 6.15                         |
| 103 C7        | 195774                      | 160282                                 | 336951                   | 0.79                         |
| 103 C18       | 193498                      | 158083                                 | 314350                   | 0.77                         |
| 104 Baseline  | 383667                      | 310857                                 | 521904                   | 1.82                         |
| 104 RT        | 294720                      | 244919                                 | 453400                   | 0.90                         |
| 104 C7        | 285376                      | 236970                                 | 521904                   | 1.82                         |
| 104 C18       | 292365                      | 244259                                 | 501400                   | 6.15                         |

* Percentage of the full repertoire taken up by the most abundant TCR.

RT: radiotherapy, C7: cycle 7, C18: cycle 18. Patient 108 continued treatment beyond radiological progression, and had a new progression sample taken when the treatment was stopped (108 Progression2). In controls (201-203) RT, C7 and C18 correspond to 1 month, 5 months and 1 year after baseline.
Supplementary table S2. Abundance of new T cell receptors among the 100 most frequent clones at radiotherapy and cycle 7. Only patient 112 had a new clone that was among the 100 most frequent clones at both time points. At cycle 7 this was the most abundant clone.

| Patient | TCR β CDR3 amino acid sequence | Count at radiotherapy | Frequency (%) at radiotherapy | Count at cycle 7 | Frequency (%) at cycle 7 |
|---------|---------------------------------|-----------------------|-------------------------------|-----------------|--------------------------|
| 101     | CASSPDRKQGGTEAFF                | -                     | -                             | 70              | 0.03                     |
| 103     | CASSARPYNEQFF                   | -                     | -                             | 117             | 0.03                     |
| 103     | CASSSSRGGYEQFF                  | -                     | -                             | 134             | 0.03                     |
| 103     | CASSQVRSGELFF                   | -                     | -                             | 140             | 0.03                     |
| 104     | CASSDEGAQNIQYF                  | 69                    | 0.02                          | -               | -                        |
| 104     | CASGLVLRPSYNSPLHF               | 78                    | 0.02                          | -               | -                        |
| 104     | CASSPSTGTYEQYF                  | 79                    | 0.02                          | -               | -                        |
| 104     | CASSSSTGGYFGELFF                | 89                    | 0.02                          | -               | -                        |
| 104     | CASSLGYRGRNEQYF                 | 111                   | 0.03                          | -               | -                        |
| 104     | CASSLQNGNTYNEQFF                | 125                   | 0.03                          | -               | -                        |
| 104     | CASLAYSQNNMYF                   | 155                   | 0.04                          | -               | -                        |
| 104     | CASSVTGSSTDQYF                  | 165                   | 0.05                          | -               | -                        |
| 104     | CASSEGYYYGYTF                   | 260                   | 0.07                          | -               | -                        |
| 104     | CASSPASTHEQYF                   | 753                   | 0.21                          | -               | -                        |
| 104     | CATSDPTGSSPGWDEQFF              | 80                    | 0.02                          | 1               | 0.00                     |
| 104     | CANHGNTTEAFF                    | 94                    | 0.03                          | 2               | 0.00                     |
| 104     | CASSFTGLEQYF                    | 174                   | 0.05                          | 2               | 0.00                     |
| 104     | CASSEQPGTGYEQYF                 | -                     | -                             | 196             | 0.06                     |
| 107     | CSARDPEALAGQVENEQFF             | -                     | -                             | 208             | 0.06                     |
| 107     | CASTVAGVRTEAFF                  | -                     | -                             | 246             | 0.06                     |
| 107     | CASSTRDLPGYTF                   | -                     | -                             | 253             | 0.06                     |
| 107     | CASSRLAYGEQFF                   | -                     | -                             | 269             | 0.07                     |
| 107     | CASSDPTGSSPGWDEQFF              | -                     | -                             | 282             | 0.07                     |
| 107     | CAISESGGIGQPHQF                 | -                     | -                             | 299             | 0.08                     |
| 107     | CASSEGQGQPQHF                   | -                     | -                             | 319             | 0.08                     |
| 107     | CASTAICTGYGYTF                  | -                     | -                             | 344             | 0.09                     |
| 107     | CASRPGLNLGETQYF                 | -                     | -                             | 409             | 0.11                     |
| 107     | CASSPGSEGLFGANVLTF              | -                     | -                             | 455             | 0.12                     |
| 107     | CASQL0YSNPQPHF                  | -                     | -                             | 817             | 0.21                     |
| 107     | CASSVQFLAGITDTQYF               | -                     | -                             | 833             | 0.21                     |
| 107     | CASSQDQVGRGVVDTQYF              | -                     | -                             | 1030            | 0.26                     |
| 107     | CASSGTSGGEANTGELFF              | -                     | -                             | 1486            | 0.38                     |
| 107     | CAWSISDMNTEAFF                  | -                     | -                             | 1869            | 0.48                     |
| 109     | CAWBSRDLRLNPQPHF                | 91                    | 0.03                          | -               | -                        |
| 109     | CASINLKAANYGYTF                 | 3                     | 0.00                          | 115             | 0.04                     |
| 109     | CASSEAPGYTIYF                   | -                     | -                             | 202             | 0.06                     |
| 109     | CASSMGNGYTF                     | 1                     | 0.00                          | 292             | 0.09                     |
| 110     | CASPPTEVYTEAFF                  | 95                    | 0.02                          | -               | -                        |
| 110     | CASSSTWTDDFYGYTF                | 97                    | 0.02                          | -               | -                        |
| 110     | CASSLKGEGKLFF                   | 144                   | 0.04                          | -               | -                        |
| 110     | CASSYGVVRDTEAFF                 | 239                   | 0.06                          | -               | -                        |
| 110     | CASSWDGSGELFF                   | 452                   | 0.11                          | -               | -                        |
| 110     | CASSFGTGEQPQHF                  | 459                   | 0.11                          | -               | -                        |
| Patient | TCR β CDR3 amino acid sequence | Count at radiotherapy | Frequency (%) at radiotherapy | Count at cycle 7 | Frequency (%) at cycle 7 |
|---------|---------------------------------|-----------------------|-----------------------------|------------------|--------------------------|
| 112     | CASRAGLWMGYTF                   | 61                    | 0.04                        | -                | -                        |
| 112     | CASSQGTSGVLYEQYF                | -                     | -                           | 60               | 0.06                     |
| 112     | CASSLVWDDQETQYF                 | 1                     | 0.00                        | 61               | 0.06                     |
| 112     | CASSLGTGENTEAFF                 | -                     | -                           | 71               | 0.07                     |
| 112     | CASSWDPPGTEAFF                  | -                     | -                           | 72               | 0.07                     |
| 112     | CAISEPGERPYNEQFF                | -                     | -                           | 73               | 0.07                     |
| 112     | CASSLAANEQFF                    | -                     | -                           | 73               | 0.07                     |
| 112     | CASSLLVVNYGYTF                  | -                     | -                           | 85               | 0.07                     |
| 112     | CASYSGQGYEQYF                   | 4                     | 0.00                        | 93               | 0.09                     |
| 112     | CSGRGTEAFF                      | -                     | -                           | 101              | 0.10                     |
| 112     | CASSPEDGVGNTGELFF               | 2                     | 0.00                        | 101              | 0.10                     |
| 112     | CASSLGQGVLGELFF                 | -                     | -                           | 103              | 0.10                     |
| 112     | CASSVETGGINTIYF                 | -                     | -                           | 106              | 0.10                     |
| 112     | CASSPDSSPGYPEQYF                | -                     | -                           | 105              | 0.10                     |
| 112     | CSASYGSGYEQYF                   | -                     | -                           | 201              | 0.19                     |
| 112     | CASSPRGVTDTQYF                  | -                     | -                           | 219              | 0.21                     |
| 112     | CASSQELSGYEQYF                  | -                     | -                           | 281              | 0.27                     |
| 112     | CASSPGGWSAFF                    | 116                   | 0.08                        | 2467             | 2.37                     |
| 115     | CASSAPPGLPTDTQYF                | 83                    | 0.05                        | -                | -                        |
| 115     | CASSGLQVEAFF                    | 350                   | 0.21                        | -                | -                        |