

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Performance of bioinformatic pipelines for identification of eccDNA in simulated datasets. The “LR_Depth” and “SR_Depth” worksheets present the original data showing the performance of analysis pipelines in identifying eccDNA from simulated datasets at different simulated sequencing depths. The “LR_Proportion” and “SR_Proportion” worksheets present the original data showing the performance of analysis pipelines in identifying eccDNA from simulated datasets under different simulated proportions of chimeric DNA (including eccDNA and linear DNA). The “Computational Resources Cost” worksheet shows the original data and summarizes the statistical results (Time and Memory consumption). Blank cells indicate the analysis pipeline encountered memory errors when analyzing specific datasets. TP1 represents the number of true positive events in the simulated datasets, while TP2 represents the number of true positive events in identified results.

File Name: Supplementary Data 2

Description: Primers used for validation and validation results. The unvalidated coordinates are marked as red.

File Name: Supplementary Data 3

Description: Highly-correlated eccDNA between different methods or technical replicates. The “Number of HC eccDNA” worksheet presents the number of highly-correlated (HC) eccDNA between the technical replicates listed in the column “A” and the row “2”. The “Proportion of HC eccDNA” worksheet shows the proportion of highly-correlated (HC) eccDNA in the technical replicates listed in the column “A”.

File Name: Supplementary Data 4

Description: Proportion of the oncogene sequence overlapped with eccDNA from each technical replicate and statistical analysis results. The “Overlapped oncogene” worksheet indicates the sequence proportion of each oncogene that can be mapped by eccDNA sequences. In the “Status of sharing” worksheet, the number represents how many replicates shared the oncogene, and the “shared by methods” column shows how many methods detected the oncogene.

File Name: Supplementary Data 5

Description: Proportion of reads mapped to repeat elements and statistical analysis results.

File Name: Supplementary Data 6

Description: List of commercial reagents or materials.