The datasets supporting the conclusions of this article are included within the article：

Figure.1: Oncomine (<https://www.oncomine.org>)



TOP1:

[https://www.oncomine.org/resource/main.html#a%3A1799%3Bcso%3AsizeSmallLarge%3Bcv%3Adetail%3Bd%3A60460007%3Bdso%3AgeneOverex%3Bdt%3ApredefinedClass%3Bec%3A%5B2%2C1%2C3%5D%3Bepv%3A150001%2C2937%2C3508%2C3519%2C4018%3Bet%3Aover%3Bf%3A60775447%3Bg%3A7150%3Bp%3A200001268%3Bpg%3A1%3Bpvf%3A37780%3Bscr%3Asummary%3Bss%3Aanalysis%3Bth%3Ag10.0%2Cp0.010%2Cfc1.5%3Bv%3A18](https://www.oncomine.org/resource/main.html#a%3A1799%3Bcso%3AsizeSmallLarge%3Bcv%3Adetail%3Bd%3A60460007%3Bdso%3AgeneOverex%3Bdt%3ApredefinedClass%3Bec%3A%5B2%2C1%2C3%5D%3Bepv%3A150001%2C2937%2C3508%2C3519%2C4018%3Bet%3Aover%3Bf%3A60775447%3Bg%3A7150%3Bp%3A200001268%3Bpg%3A1%3Bpvf%3A37780%3Bscr%3As)

TOP1MT: <https://www.oncomine.org/resource/main.html#cso%3AsizeSmallLarge%3Bcv%3Adetail%3Bdso%3AgeneOverex%3Bec%3A%5B2%2C1%2C3%5D%3Bepv%3A150001%2C2937%2C3508%2C3519%2C4018%3Bet%3Aover%3Bg%3A116447%3Bp%3A200001268%3Bpg%3A1%3Bpvf%3A37781%3Bscr%3Asummary%3Bss%3Aanalysis%3Bth%3Ag10.0%2Cp0.010%2Cfc1.5%3Bv%3A18>

TOP2A:

<https://www.oncomine.org/resource/main.html#cso%3AsizeSmallLarge%3Bcv%3Adetail%3Bdso%3AgeneOverex%3Bec%3A%5B2%2C1%2C3%5D%3Bepv%3A150001%2C2937%2C3508%2C3519%2C4018%3Bet%3Aover%3Bg%3A7153%3Bp%3A200001268%3Bpg%3A1%3Bpvf%3A37784%3Bscr%3Asummary%3Bss%3Aanalysis%3Bth%3Ag10.0%2Cp0.010%2Cfc1.5%3Bv%3A18>

TOP2B:

<https://www.oncomine.org/resource/main.html#cso%3AsizeSmallLarge%3Bcv%3Adetail%3Bdso%3AgeneOverex%3Bec%3A%5B2%2C1%2C3%5D%3Bepv%3A150001%2C2937%2C3508%2C3519%2C4018%3Bet%3Aover%3Bg%3A7155%3Bp%3A200001268%3Bpg%3A1%3Bpvf%3A37785%3Bscr%3Asummary%3Bss%3Aanalysis%3Bth%3Ag10.0%2Cp0.010%2Cfc1.5%3Bv%3A18>

TOP3A:

<https://www.oncomine.org/resource/main.html#cso%3AsizeSmallLarge%3Bcv%3Adetail%3Bdso%3AgeneOverex%3Bec%3A%5B2%2C1%2C3%5D%3Bepv%3A150001%2C2937%2C3508%2C3519%2C4018%3Bet%3Aover%3Bg%3A7156%3Bp%3A200001268%3Bpg%3A1%3Bpvf%3A37786%3Bscr%3Asummary%3Bss%3Aanalysis%3Bth%3Ag10.0%2Cp0.010%2Cfc1.5%3Bv%3A18>

TOP3B:

<https://www.oncomine.org/resource/main.html#cso%3AsizeSmallLarge%3Bcv%3Adetail%3Bdso%3AgeneOverex%3Bec%3A%5B2%2C1%2C3%5D%3Bepv%3A150001%2C2937%2C3508%2C3519%2C4018%3Bet%3Aover%3Bg%3A8940%3Bp%3A200001268%3Bpg%3A1%3Bpvf%3A37787%3Bscr%3Asummary%3Bss%3Aanalysis%3Bth%3Ag10.0%2Cp0.010%2Cfc1.5%3Bv%3A18>

Figure 2.

Figure 2(A). GEPIA(<http://gepia.cancer-pku.cn/>)

TOP1: [http://gepia.cancer-pku.cn/detail.php?gene=TOP1###](http://gepia.cancer-pku.cn/detail.php?gene=TOP1)

TOP1MT: http://gepia.cancer-pku.cn/detail.php?gene= TOP1MT ###

TOP2A: http://gepia.cancer-pku.cn/detail.php?gene= TOP2A ###

TOP2B: http://gepia.cancer-pku.cn/detail.php?gene= TOP2B ###

TOP3A: http://gepia.cancer-pku.cn/detail.php?gene= TOP3A ###

TOP3B: http://gepia.cancer-pku.cn/detail.php?gene= TOP3B ###

Figure 2(B). GEPIA(<http://gepia.cancer-pku.cn/>)

Expression DIY→BOXPLOT→Gene→|Log2FC| Cutoff:(1) →p -value Cutoff：（0.01）→datasets selection(SARC) →Log Scale（Yes）→Jitter Size（0.4）→Matched Normal data （Match TCGA normal and GTEx data）

TOP1: [http://gepia.cancer-pku.cn/detail.php?gene=TOP1###](http://gepia.cancer-pku.cn/detail.php?gene=TOP1)

TOP1MT: http://gepia.cancer-pku.cn/detail.php?gene= TOP1MT ###

TOP2A: http://gepia.cancer-pku.cn/detail.php?gene= TOP2A ###

TOP2B: http://gepia.cancer-pku.cn/detail.php?gene= TOP2B ###

TOP3A: http://gepia.cancer-pku.cn/detail.php?gene= TOP3A ###

TOP3B: http://gepia.cancer-pku.cn/detail.php?gene= TOP3B ###

Figure2(C) [http://gepia.cancer-pku.cn/detail.php?gene=TOP1###](http://gepia.cancer-pku.cn/detail.php?gene=TOP1)

Expression DIY→Multiple Gene Comparison→gene list(TOP1/TOP1MT/TOP2A/TOP2B/TOP3A/TOP3B)



Figure3(A) tcgaportal( http://tcgaportal.org)

TOP1:

<http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP1&devidePatientN=median&LowVal=&HighVal=&subtype=All>

TOP1MT: <http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP1MT&devidePatientN=median&LowVal=&HighVal=&subtype=All>

TOP2A: <http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP2A&devidePatientN=median&LowVal=&HighVal=&subtype=All>

TOP2B: <http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP2B&devidePatientN=median&LowVal=&HighVal=&subtype=All>

TOP3A: <http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP3A&devidePatientN=median&LowVal=&HighVal=&subtype=All>

TOP3B: <http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP3B&devidePatientN=median&LowVal=&HighVal=&subtype=All>

Figure 3B:

<https://www.cbioportal.org/results/oncoprint?genetic_profile_ids_PROFILE_MUTATION_EXTENDED=sarc_tcga_pub_mutations&genetic_profile_ids_PROFILE_COPY_NUMBER_ALTERATION=sarc_tcga_pub_gistic&genetic_profile_ids_PROFILE_MRNA_EXPRESSION=sarc_tcga_pub_rna_seq_v2_mrna_median_Zscores&cancer_study_list=sarc_tcga_pub&Z_SCORE_THRESHOLD=2.0&RPPA_SCORE_THRESHOLD=2.0&data_priority=0&profileFilter=0&case_set_id=sarc_tcga_pub_3way_complete&gene_list=TOP1%252CTOP1MT%252CTOP2A%252CTOP2B%252CTOP3A%252CTOP3B&geneset_list=%20&tab_index=tab_visualize&Action=Submit>
Clinical→Months to Distant Recurrence



Figure 4(A) (B): cBioPortal (https://www.cbioportal.org)

Short histology:

<https://www.cbioportal.org/results/comparison?genetic_profile_ids_PROFILE_MUTATION_EXTENDED=sarc_tcga_pub_mutations&genetic_profile_ids_PROFILE_COPY_NUMBER_ALTERATION=sarc_tcga_pub_gistic&genetic_profile_ids_PROFILE_MRNA_EXPRESSION=sarc_tcga_pub_rna_seq_v2_mrna_median_Zscores&cancer_study_list=sarc_tcga_pub&Z_SCORE_THRESHOLD=2.0&RPPA_SCORE_THRESHOLD=2.0&data_priority=0&profileFilter=0&case_set_id=sarc_tcga_pub_3way_complete&gene_list=TOP1%252CTOP1MT%252CTOP2A%252CTOP2B%252CTOP3A%252CTOP3B&geneset_list=%20&tab_index=tab_visualize&Action=Submit&comparison_subtab=clinical&comparison_selectedGroups=%5B%22TOP1%22%2C%22TOP1MT%22%2C%22TOP2A%22%2C%22TOP2B%22%2C%22TOP3A%22%2C%22TOP3B%22%5D&mutations_gene=TOP1>

DNA methylation cluster:



<https://www.cbioportal.org/results/comparison?genetic_profile_ids_PROFILE_MUTATION_EXTENDED=sarc_tcga_pub_mutations&genetic_profile_ids_PROFILE_COPY_NUMBER_ALTERATION=sarc_tcga_pub_gistic&genetic_profile_ids_PROFILE_MRNA_EXPRESSION=sarc_tcga_pub_rna_seq_v2_mrna_median_Zscores&cancer_study_list=sarc_tcga_pub&Z_SCORE_THRESHOLD=2.0&RPPA_SCORE_THRESHOLD=2.0&data_priority=0&profileFilter=0&case_set_id=sarc_tcga_pub_3way_complete&gene_list=TOP1%252CTOP1MT%252CTOP2A%252CTOP2B%252CTOP3A%252CTOP3B&geneset_list=%20&tab_index=tab_visualize&Action=Submit&comparison_subtab=clinical&comparison_selectedGroups=%5B%22TOP1%22%2C%22TOP1MT%22%2C%22TOP2A%22%2C%22TOP2B%22%2C%22TOP3A%22%2C%22TOP3B%22%5D&mutations_gene=TOP1>

Figure 4(C):TCGAportal ( http://tcgaportal.org)

TOP1:

<http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP1&devidePatientN=median&LowVal=&HighVal=&subtype=All>

TOP1MT: <http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP1MT&devidePatientN=median&LowVal=&HighVal=&subtype=All>

TOP2A: <http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP2A&devidePatientN=median&LowVal=&HighVal=&subtype=All>

TOP2B: <http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP2B&devidePatientN=median&LowVal=&HighVal=&subtype=All>

TOP3A: <http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP3A&devidePatientN=median&LowVal=&HighVal=&subtype=All>

TOP3B: <http://tcgaportal.org/TCGA/SoftTissue_TCGA_SARC/process.php?geneName=TOP3B&devidePatientN=median&LowVal=&HighVal=&subtype=All>

Figure 5(A)(B): cBioPortal(<https://www.cbioportal.org>)

cancer type summary

<https://www.cbioportal.org/results/comparison?genetic_profile_ids_PROFILE_MUTATION_EXTENDED=sarc_tcga_pub_mutations&genetic_profile_ids_PROFILE_COPY_NUMBER_ALTERATION=sarc_tcga_pub_gistic&genetic_profile_ids_PROFILE_MRNA_EXPRESSION=sarc_tcga_pub_rna_seq_v2_mrna_median_Zscores&cancer_study_list=sarc_tcga_pub&Z_SCORE_THRESHOLD=2.0&RPPA_SCORE_THRESHOLD=2.0&data_priority=0&profileFilter=0&case_set_id=sarc_tcga_pub_3way_complete&gene_list=TOP1%252CTOP1MT%252CTOP2A%252CTOP2B%252CTOP3A%252CTOP3B&geneset_list=%20&tab_index=tab_visualize&Action=Submit&comparison_subtab=mutations&comparison_selectedGroups=%5B%22Altered%20group%22%2C%22Unaltered%20group%22%5D&mutations_gene=TOP1>

Figure 5(C) TIMER→SCNA

<https://cistrome.shinyapps.io/timer/>

Figure 7: TIMER→Gene

<https://cistrome.shinyapps.io/timer/>

Figure 7: TIMER→Survival

<https://cistrome.shinyapps.io/timer/>

Figure 8: Kaplan-Meier Plotter

|  |  |  |
| --- | --- | --- |
| RNAseq ID: | TOP1 | [-](http://kmplot.com/analysis/index.php?p=service) |
| Survival: | OS/DFS |  |
| Auto select best cutoff: | checked |  |
| Follow up threshold: | all |  |
| Censore at threshold: | checked |  |
| Compute median over entire database: | false |  |
| Cutoff value used in analysis: | 2021 |  |
| Cancer type :  | sarcoma |  |

<http://kmplot.com/analysis/index.php?p=service>

Figure 9 Figure 10 Figure 11:

：metascape(https://metascape.org/gp/index.html) 