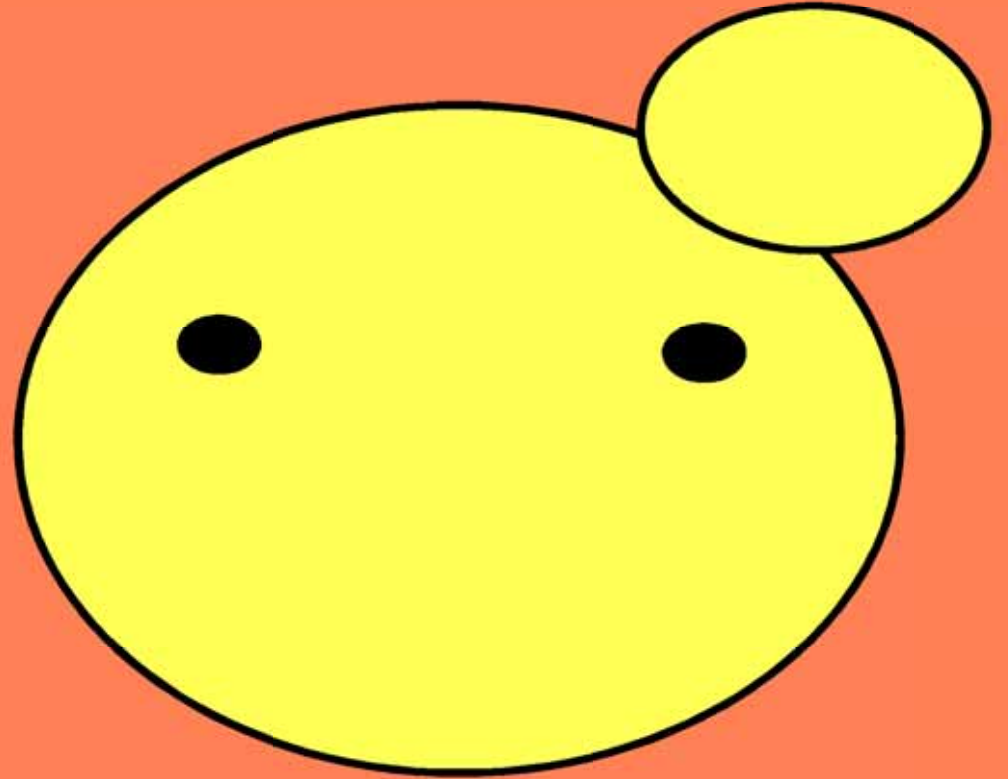
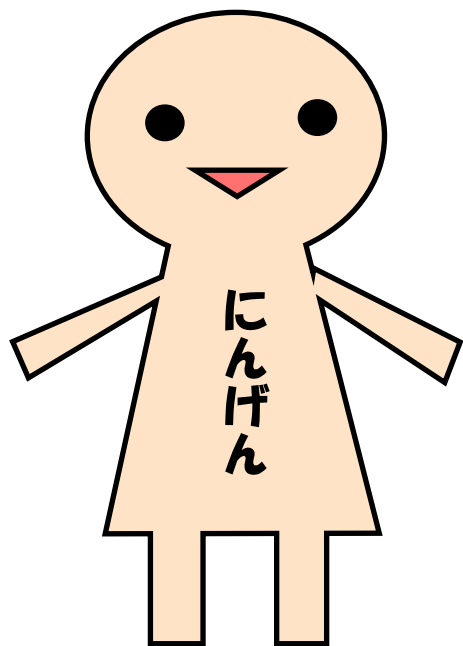
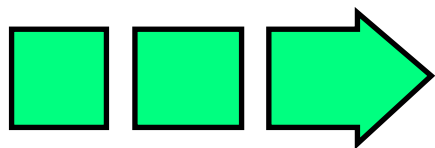
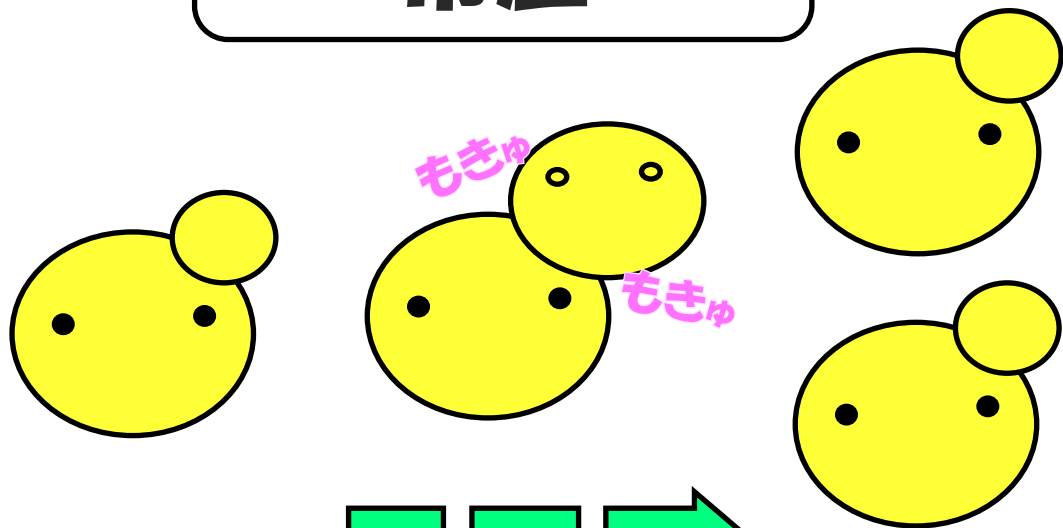


酵母と

強力
生八



常温



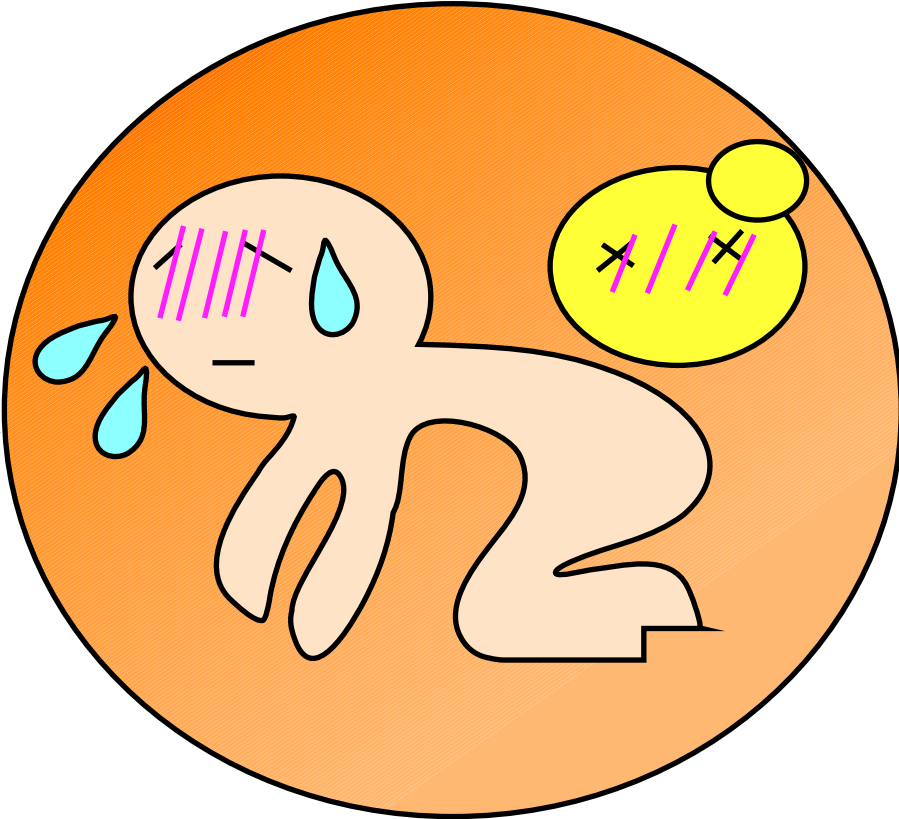
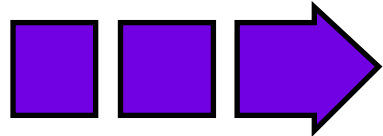
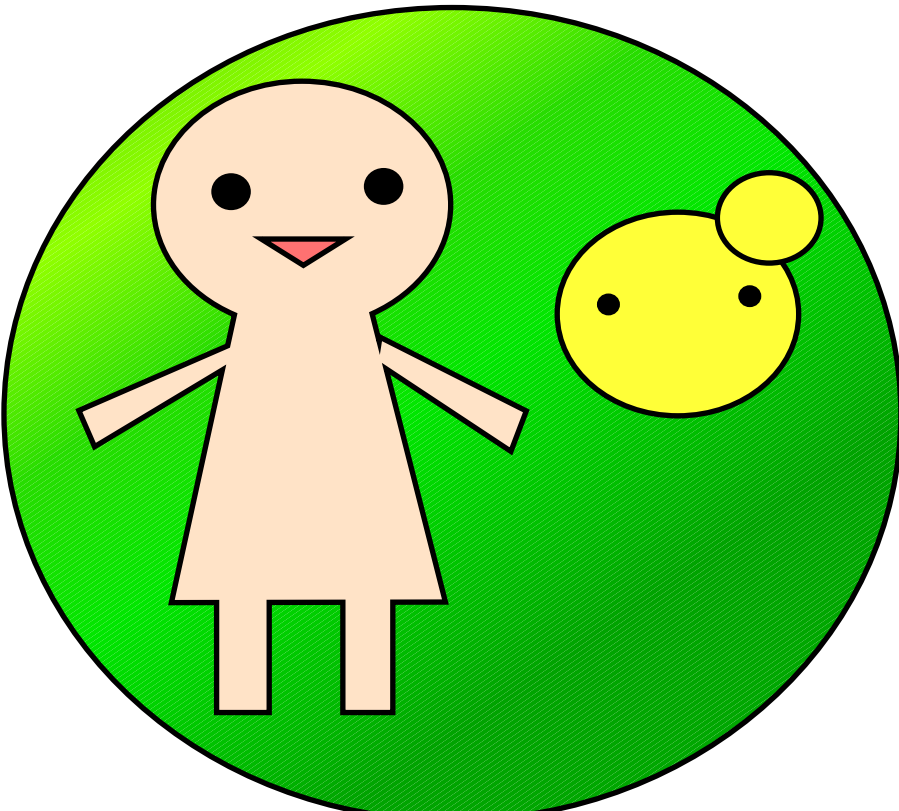
高温

ぼたんきゅう〜



あつい!



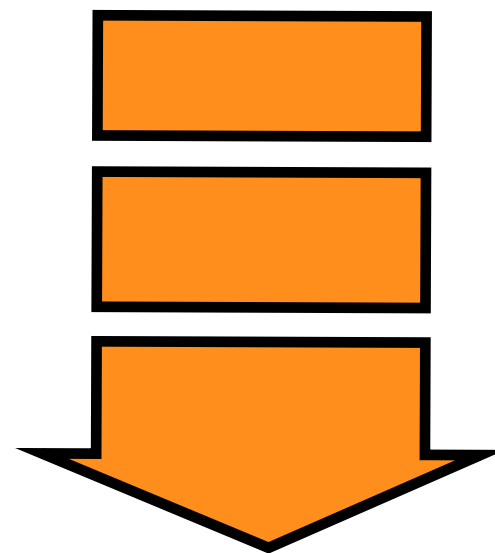


~37°C

38°C 以上



危険な温度に近い！



**何か理由がある筈
その原因を探る☆**

酵母のゲノム (genome: 遺伝子全体)

AACT RPILZAA HSP150 VL0230 DALY TFE MFI YL016W HMAI SLMI H02J V0W1 IYF PHT1 Y02I PMSI MV10 AC01 SALL KANA VER010 ELET IIALI PAEZ VL020C OLBT S0H1 H04D1 V.L059I GPH3 V0213C RAOY V0339W AR01A H011 H051 H053 RTT10V AAC3 RPILZAA HSP26 Y0L20W DALB0 TF4A3Z H011 H012 H013 H014 H015 H016 H017 H018 H019 H020 H021 H022 H023 H024 H025 H026 H027 H028 H029 H030 H031 H032 H033 H034 H035 H036 H037 H038 H039 H040 H041 H042 H043 H044 H045 H046 H047 H048 H049 H050 H051 H052 H053 H054 H055 H056 H057 H058 H059 H060 H061 H062 H063 H064 H065 H066 H067 H068 H069 H070 H071 H072 H073 H074 H075 H076 H077 H078 H079 H080 H081 H082 H083 H084 H085 H086 H087 H088 H089 H090 H091 H092 H093 H094 H095 H096 H097 H098 H099 H100 H101 H102 H103 H104 H105 H106 H107 H108 H109 H110 H111 H112 H113 H114 H115 H116 H117 H118 H119 H120 H121 H122 H123 H124 H125 H126 H127 H128 H129 H130 H131 H132 H133 H134 H135 H136 H137 H138 H139 H140 H141 H142 H143 H144 H145 H146 H147 H148 H149 H150 H151 H152 H153 H154 H155 H156 H157 H158 H159 H160 H161 H162 H163 H164 H165 H166 H167 H168 H169 H170 H171 H172 H173 H174 H175 H176 H177 H178 H179 H180 H181 H182 H183 H184 H185 H186 H187 H188 H189 H190 H191 H192 H193 H194 H195 H196 H197 H198 H199 H200 H201 H202 H203 H204 H205 H206 H207 H208 H209 H210 H211 H212 H213 H214 H215 H216 H217 H218 H219 H220 H221 H222 H223 H224 H225 H226 H227 H228 H229 H230 H231 H232 H233 H234 H235 H236 H237 H238 H239 H240 H241 H242 H243 H244 H245 H246 H247 H248 H249 H250 H251 H252 H253 H254 H255 H256 H257 H258 H259 H260 H261 H262 H263 H264 H265 H266 H267 H268 H269 H270 H271 H272 H273 H274 H275 H276 H277 H278 H279 H280 H281 H282 H283 H284 H285 H286 H287 H288 H289 H290 H291 H292 H293 H294 H295 H296 H297 H298 H299 H300 H301 H302 H303 H304 H305 H306 H307 H308 H309 H310 H311 H312 H313 H314 H315 H316 H317 H318 H319 H320 H321 H322 H323 H324 H325 H326 H327 H328 H329 H330 H331 H332 H333 H334 H335 H336 H337 H338 H339 H340 H341 H342 H343 H344 H345 H346 H347 H348 H349 H350 H351 H352 H353 H354 H355 H356 H357 H358 H359 H360 H361 H362 H363 H364 H365 H366 H367 H368 H369 H370 H371 H372 H373 H374 H375 H376 H377 H378 H379 H380 H381 H382 H383 H384 H385 H386 H387 H388 H389 H390 H391 H392 H393 H394 H395 H396 H397 H398 H399 H400 H401 H402 H403 H404 H405 H406 H407 H408 H409 H410 H411 H412 H413 H414 H415 H416 H417 H418 H419 H420 H421 H422 H423 H424 H425 H426 H427 H428 H429 H430 H431 H432 H433 H434 H435 H436 H437 H438 H439 H440 H441 H442 H443 H444 H445 H446 H447 H448 H449 H450 H451 H452 H453 H454 H455 H456 H457 H458 H459 H460 H461 H462 H463 H464 H465 H466 H467 H468 H469 H470 H471 H472 H473 H474 H475 H476 H477 H478 H479 H480 H481 H482 H483 H484 H485 H486 H487 H488 H489 H490 H491 H492 H493 H494 H495 H496 H497 H498 H499 H500 H501 H502 H503 H504 H505 H506 H507 H508 H509 H510 H511 H512 H513 H514 H515 H516 H517 H518 H519 H520 H521 H522 H523 H524 H525 H526 H527 H528 H529 H530 H531 H532 H533 H534 H535 H536 H537 H538 H539 H540 H541 H542 H543 H544 H545 H546 H547 H548 H549 H550 H551 H552 H553 H554 H555 H556 H557 H558 H559 H560 H561 H562 H563 H564 H565 H566 H567 H568 H569 H570 H571 H572 H573 H574 H575 H576 H577 H578 H579 H580 H581 H582 H583 H584 H585 H586 H587 H588 H589 H590 H591 H592 H593 H594 H595 H596 H597 H598 H599 H600 H601 H602 H603 H604 H605 H606 H607 H608 H609 H610 H611 H612 H613 H614 H615 H616 H617 H618 H619 H620 H621 H622 H623 H624 H625 H626 H627 H628 H629 H630 H631 H632 H633 H634 H635 H636 H637 H638 H639 H640 H641 H642 H643 H644 H645 H646 H647 H648 H649 H650 H651 H652 H653 H654 H655 H656 H657 H658 H659 H660 H661 H662 H663 H664 H665 H666 H667 H668 H669 H670 H671 H672 H673 H674 H675 H676 H677 H678 H679 H680 H681 H682 H683 H684 H685 H686 H687 H688 H689 H690 H691 H692 H693 H694 H695 H696 H697 H698 H699 H700 H701 H702 H703 H704 H705 H706 H707 H708 H709 H710 H711 H712 H713 H714 H715 H716 H717 H718 H719 H720 H721 H722 H723 H724 H725 H726 H727 H728 H729 H730 H731 H732 H733 H734 H735 H736 H737 H738 H739 H740 H741 H742 H743 H744 H745 H746 H747 H748 H749 H750 H751 H752 H753 H754 H755 H756 H757 H758 H759 H760 H761 H762 H763 H764 H765 H766 H767 H768 H769 H770 H771 H772 H773 H774 H775 H776 H777 H778 H779 H780 H781 H782 H783 H784 H785 H786 H787 H788 H789 H790 H791 H792 H793 H794 H795 H796 H797 H798 H799 H800 H801 H802 H803 H804 H805 H806 H807 H808 H809 H810 H811 H812 H813 H814 H815 H816 H817 H818 H819 H820 H821 H822 H823 H824 H825 H826 H827 H828 H829 H830 H831 H832 H833 H834 H835 H836 H837 H838 H839 H840 H841 H842 H843 H844 H845 H846 H847 H848 H849 H850 H851 H852 H853 H854 H855 H856 H857 H858 H859 H860 H861 H862 H863 H864 H865 H866 H867 H868 H869 H870 H871 H872 H873 H874 H875 H876 H877 H878 H879 H880 H881 H882 H883 H884 H885 H886 H887 H888 H889 H890 H891 H892 H893 H894 H895 H896 H897 H898 H899 H900 H901 H902 H903 H904 H905 H906 H907 H908 H909 H910 H911 H912 H913 H914 H915 H916 H917 H918 H919 H920 H921 H922 H923 H924 H925 H926 H927 H928 H929 H930 H931 H932 H933 H934 H935 H936 H937 H938 H939 H940 H941 H942 H943 H944 H945 H946 H947 H948 H949 H950 H951 H952 H953 H954 H955 H956 H957 H958 H959 H960 H961 H962 H963 H964 H965 H966 H967 H968 H969 H970 H971 H972 H973 H974 H975 H976 H977 H978 H979 H980 H981 H982 H983 H984 H985 H986 H987 H988 H989 H990 H991 H992 H993 H994 H995 H996 H997 H998 H999

Secretion

RNA metabolism

Translation

Processing

Folding

Vesicular transport

Modification

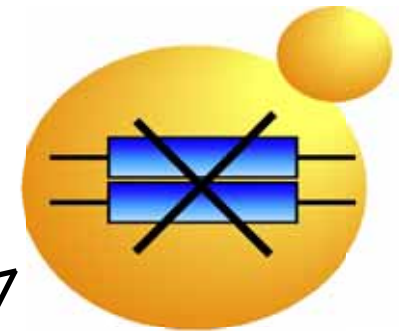
DNA maintenans

Degradation

約6000個ある!

研究用酵母 (Saccharomyces cerevisiae)

生存にとって必須な遺伝子約1,200個を除いた
4792株の遺伝子破壊株が販売されている。



Homozygous Diploid

	1	2	3	4	5	6	7	8	9	10	11	12
A	YNL009W	YNL010W	YNL012W	YNL013C	YNL016W	YNL020C	YNL022C	YNL023C	YNL024C	YNL025C	YNL027W	YNL031C
B	YNL032W	YNL034W	YNL035C	YNL041C	YNL043C	YNL044W	YNL045W	YNL046W	YNL049C	YNR001C	YNR002C	YNR004W
C	YNR005C	YNR006W	YNR007C	YNR008W	YNR009W	YNR012W	YNR013C	YNR014W	YNR015W	YNR018W	YNR019W	YNR020C
D	YNR021W	YNR024W	○	YNR025C	YNR027W	YNR028W	YNR029C	YNR030W	YNR031C	YNR032W	YNR034W	YNR036C
E	YNR037C	YNR039C	YNR040W	YNR041C	YNR042W	YNR045W	YNR048W	YNR049C	YBL095W	YBL096C	YBL098W	YBL099W
F	YBL100C	YBL101C	YBL102W	YBL104C	YBL106C	YBL107C	YBR001C	YBR005W	YBR006W	YBR007C	YBR008C	YBR009C
G	YBR010W	YBR012C	YBR013C	YBR014C	YBR015C	YBR016W	YBR018C	YBR019C	YBR020W	YBR022W	YBR023C	YBR024W
H	○	YBR025C	YBR026C	YBR027C	YBR028C	YBR029C	YBR031W	YBR032W	YBR033W	YBR034C	YPL004C	YBR036C

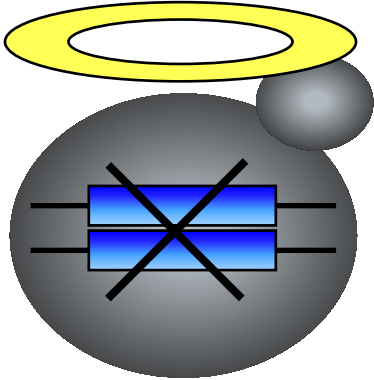
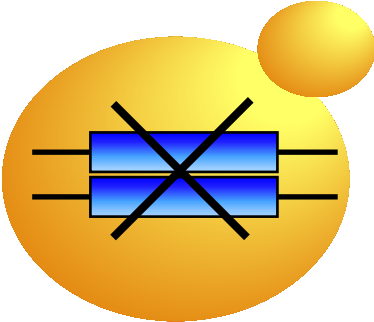
96 well x 54 plates

4792 非必須遺伝子破壊株

ゲノムワイドスクリーニング

	1	2	3	4	5	6	7	8	9	10	11	12
A	YNL009W	YNL010W	YNL012W	YNL013C	YNL016W	YNL020C	YNL022C	YNL023C	YNL024W	YNL025W	YNL026W	YNL027C
B	YNL032W	YNL034W	YNL035C	YNL041C	YNL043C	YNL044W	YNL045W	YNL046W	YNL047W	YNL048W	YNL049W	YNL050W
C	YNR005C	YNR006W	YNR007C	YNR008W	YNR009W	YNR012W	YNR013C	YNR014W	YNR015W	YNR018W	YNR019W	YNR020C
D	YNR021W	YNR024W	YNR025C	YNR027W	YNR028W	YNR029C	YNR030W	YNR031C	YNR032W	YNR034W	YNR036C	YNR037C
E	YNR037C	YNR039C	YNR040W	YNR041C	YNR042W	YNR045W	YNR048W	YNR049C	YBL095W	YBL096C	YBL098W	YBL099W
F	YBL100C	YBL101C	YBL102W	YBL104C	YBL106C	YBL107C	YBR001C	YBR005W	YBR006W	YBR007C	YBR008C	YBR009C
G	YBR010W	YBR012C	YBR013C	YBR014C	YBR015C	YBR016W	YBR018C	YBR019C	YBR020W	YBR022W	YBR023C	YBR024W
H	YBR025C	YBR026C	YBR027C	YBR028C	YBR029C	YBR031W	YBR032W	YBR033W	YBR034C	YPL004C	YPL005C	YPL006C

Homozygous Diploid



4792 非必須遺伝子破壊株

PICK UP !!

死にやすい株

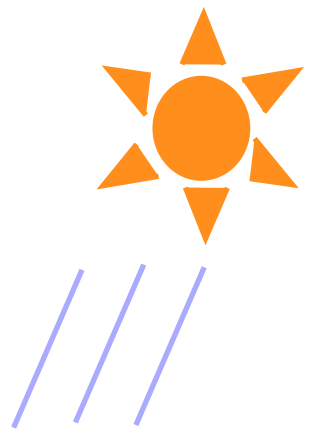
熱の影響を受けやすい株

DNA修復

introduction



DNAの複製ミス、紫外線など

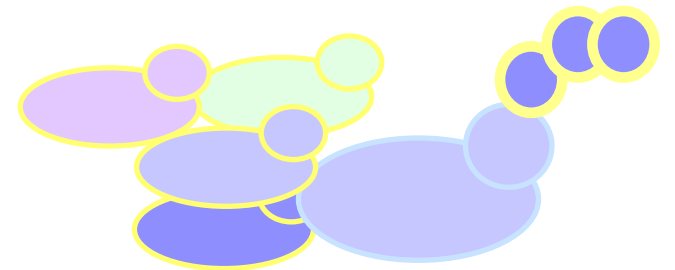
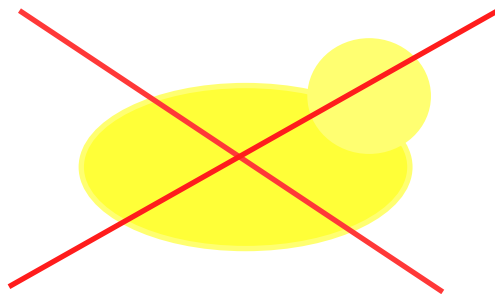
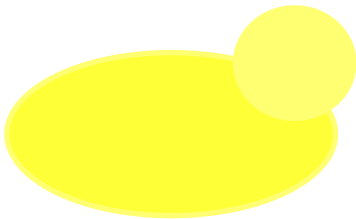


DNAの損傷

DNA修復

アポトーシス

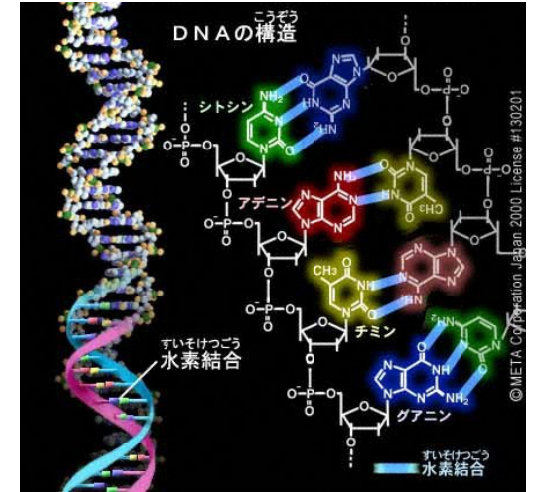
癌化



染色体ってなに？

染色体DNA: 遺伝子などが連なったもの

相同染色体: 人間は父親由来の染色体と母親由来の染色体を持っている
この対となっている染色体のこと、同じ種類の染色体のセット



父親由来染色体



相同染色体

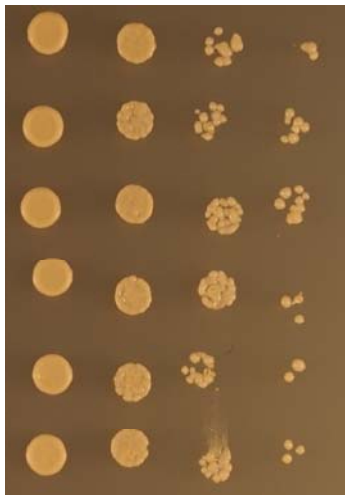
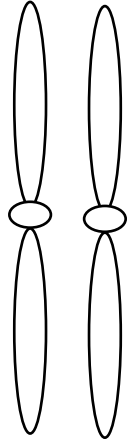


母親由来染色体

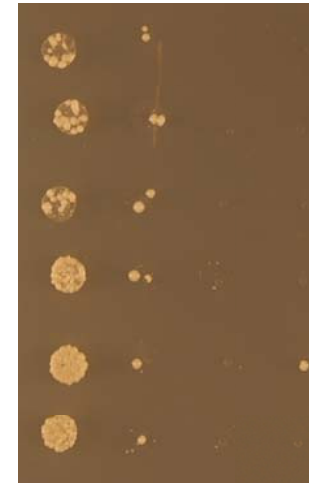


実験概要

相同染色体のある酵母
(=染色体2本)



相同染色体のない酵母
(=染色体1本)



DNA損傷

DNAの修復はどうか?
細胞の増殖の差で判断する

DNA修復機構の解明⇒新薬開発等

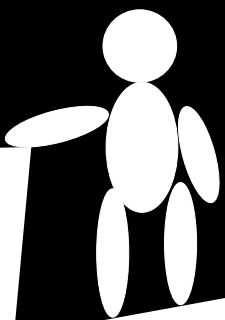
西子

母

と

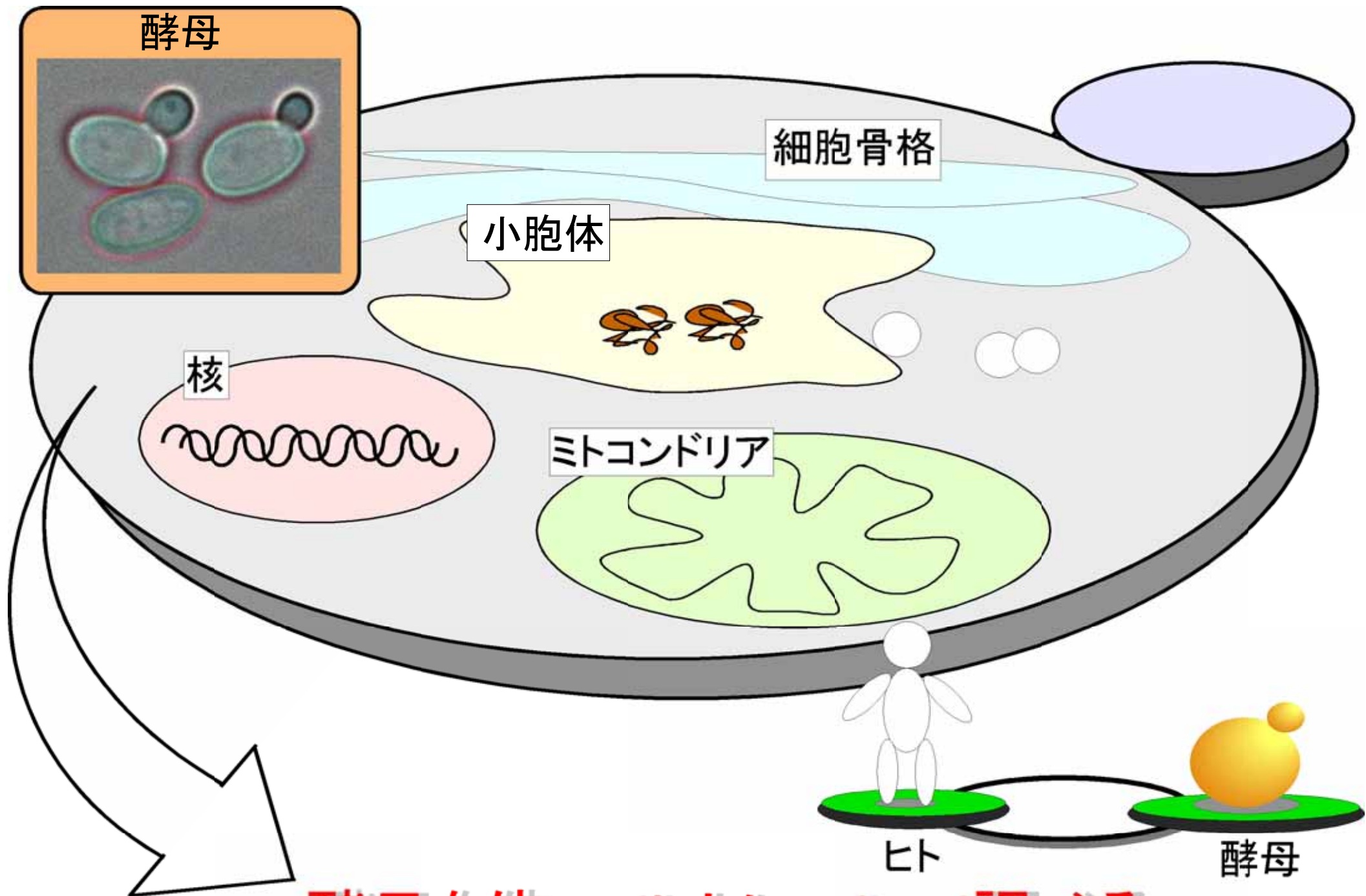
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下



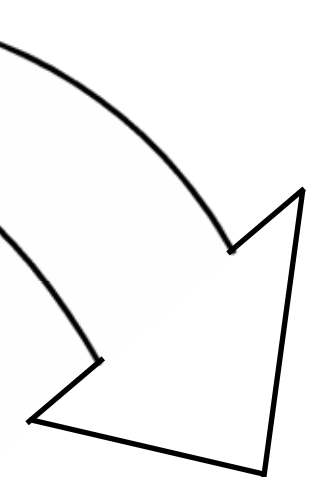
福永

知晃



酵母を使ってヒトについて調べる

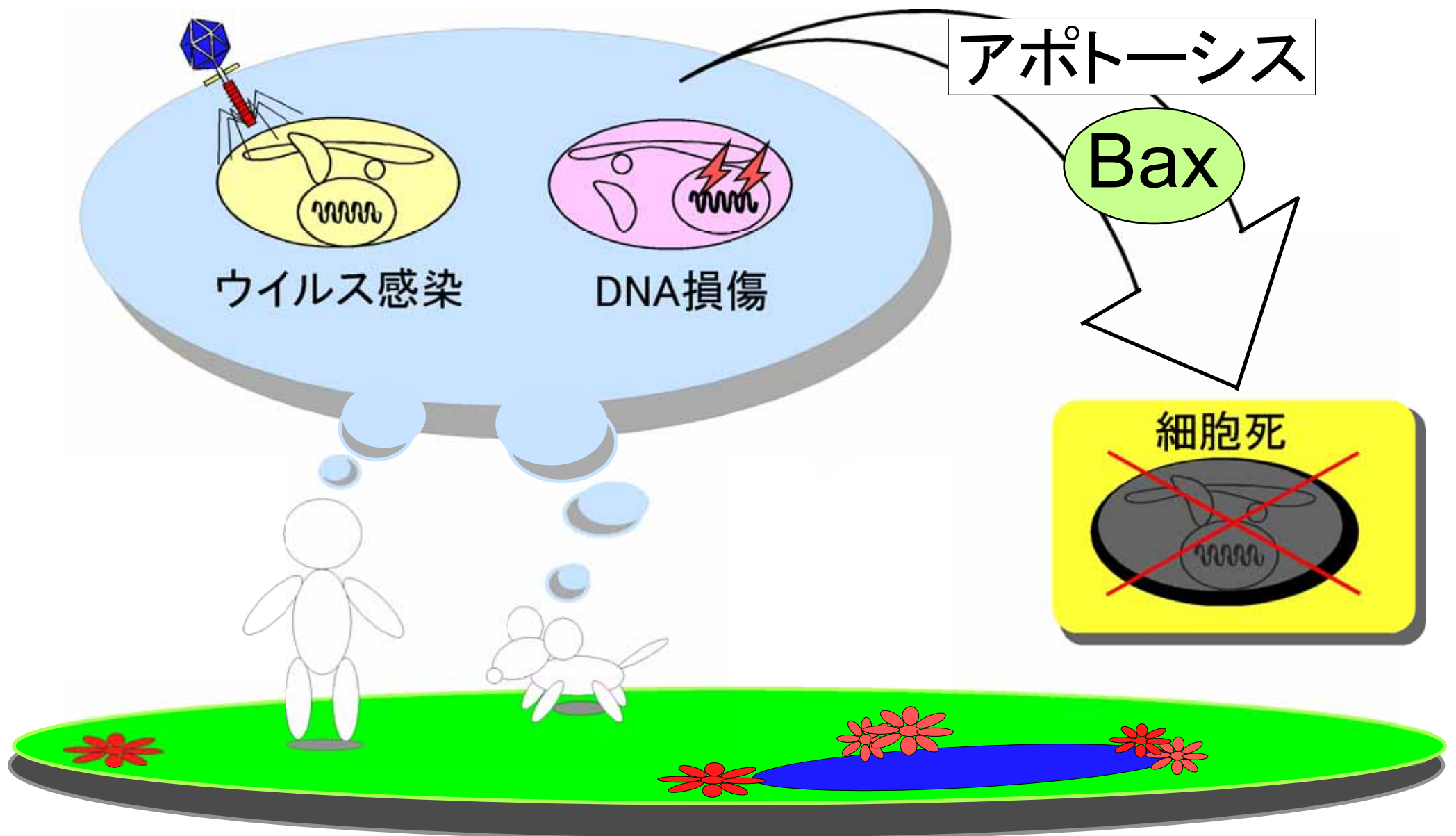
Bax



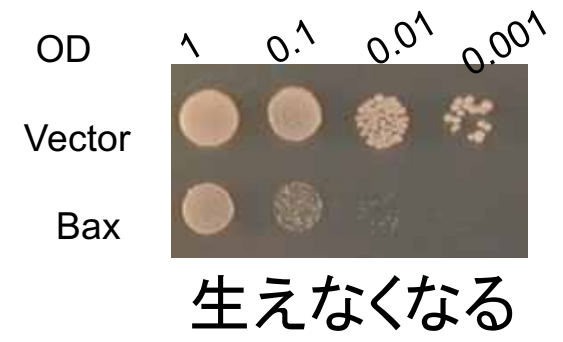
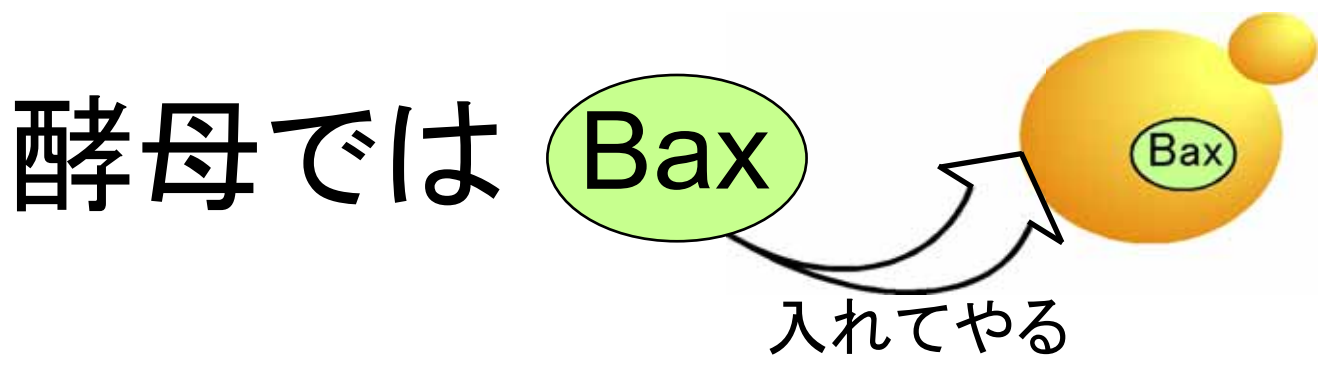
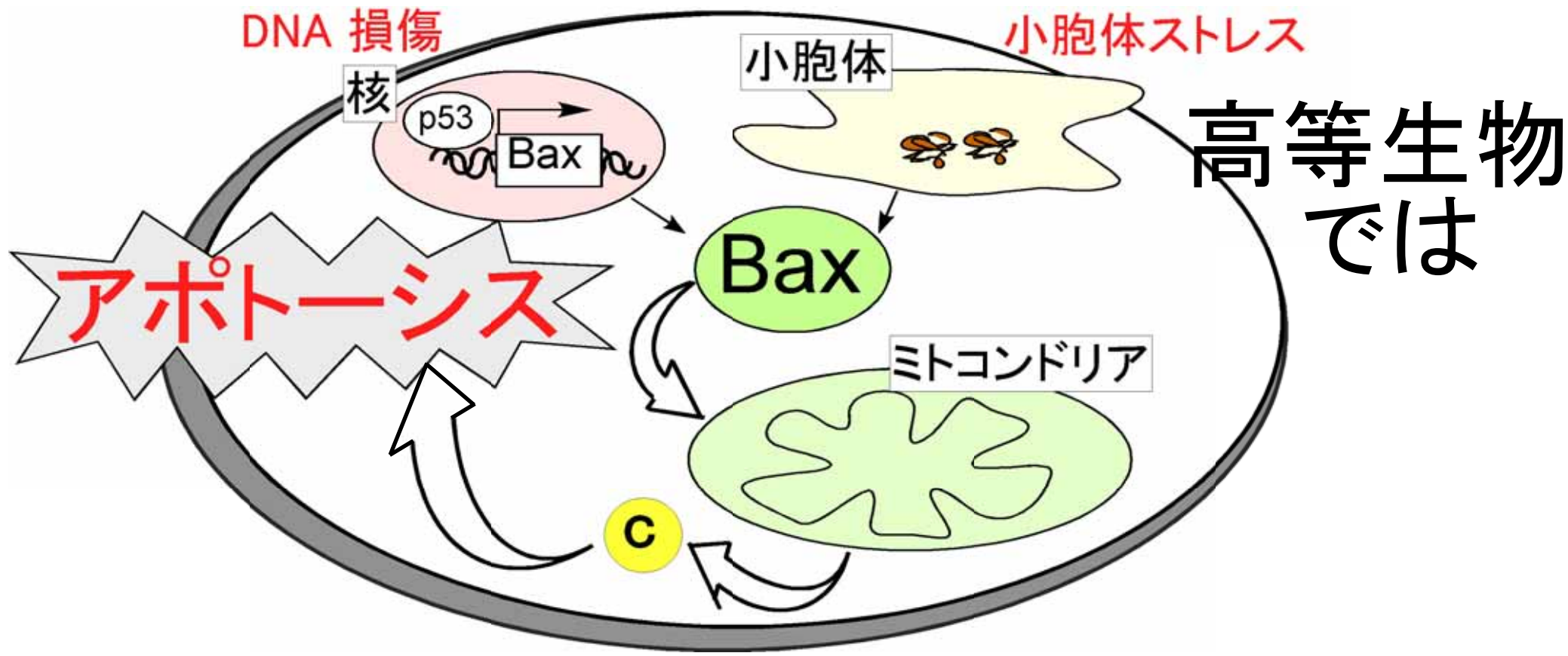
癌



生きてくる間、ずっと起きているアポトーシス



高等生物、酵母におけるBaxの働き





細胞死 ≠ 増殖停止



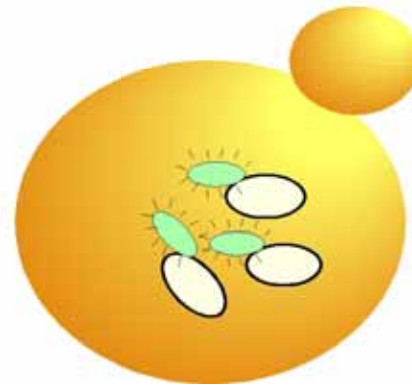
酵母に特有

**酵母を使えば
新しいことがわかるかも!?**

yEGFP

Bax

融合タンパク



酵母でBaxがどこに行くのか？