1
00:00:04,170 --> 00:00:02,159
you wouldn't think things like diaper

2
00:00:05,880 --> 00:00:04,180
rash or thrush could be studied on the

3
00:00:07,920 --> 00:00:05,890
International Space Station but an

4
00:00:10,470 --> 00:00:07,930
investigation is looking at that type of

5
00:00:13,109 --> 00:00:10,480
bacteria come into us here on earth to

6
00:00:14,850 --> 00:00:13,119
see how it reacts in microgravity we

7
00:00:17,640 --> 00:00:14,860
work with the yeast it's called Candida

8
00:00:19,769 --> 00:00:17,650
albicans that causes fairly common and

9
00:00:23,640 --> 00:00:19,779
superficial diseases and infections such

10
00:00:26,450 --> 00:00:23,650
as thrush fungal nails diaper rash and

11
00:00:29,640 --> 00:00:26,460
it can also cause more serious systemic

12
00:00:31,679 --> 00:00:29,650
sort of potentially fatal diseases as

13
00:00:33,420 --> 00:00:31,689

well and you've completed your

14
00:00:35,970 --> 00:00:33,430
experiment correct our experiment went

15
00:00:40,290 --> 00:00:35,980
up in October of 2012 and spent about 28

16
00:00:42,180 --> 00:00:40,300
days on ISS so why is the ISS an ideal

17
00:00:44,520 --> 00:00:42,190
place to study things that may cause

18
00:00:46,920 --> 00:00:44,530
diaper rash or something like that right

19
00:00:48,810 --> 00:00:46,930
well like I said Canada is a fairly

20
00:00:50,700 --> 00:00:48,820
common yeast about twenty-five percent

21
00:00:53,009 --> 00:00:50,710
of the population is exposed to it at

22
00:00:56,759 --> 00:00:53,019
some point and if you combine that with

23
00:00:57,750 --> 00:00:56,769
the reality that we've heard here and

24
00:00:59,939 --> 00:00:57,760
we've heard lots of places that

25
00:01:01,950 --> 00:00:59,949
astronauts have a somewhat compromised

26
00:01:03,810 --> 00:01:01,960
immune system and then if you combine

27
00:01:05,820 --> 00:01:03,820
that with a potentially infectious agent

28
00:01:07,590 --> 00:01:05,830
that's why NASA is interested in it and

29
00:01:09,420 --> 00:01:07,600
that's why it's really important to be

30
00:01:11,100 --> 00:01:09,430
able to study in an environment where

31
00:01:13,200 --> 00:01:11,110
there is prolonged exposure to those

32
00:01:15,450 --> 00:01:13,210
microgravity sort of extreme environment

33
00:01:17,880 --> 00:01:15,460
conditions how would that bacteria get

34
00:01:20,819 --> 00:01:17,890
to the space station so this is a yeast

35
00:01:23,490 --> 00:01:20,829
that can be that we can be carriers of

36
00:01:25,920 --> 00:01:23,500
it and so we can carry it along with us

37
00:01:28,590 --> 00:01:25,930
when when we're moving around and as an

38
00:01:30,090 --> 00:01:28,600

opportunistic pathogen a lot of times it

39
00:01:31,319 --> 00:01:30,100
doesn't cause disease we don't even

40
00:01:33,060 --> 00:01:31,329
really know it's there and it's only

41
00:01:35,130 --> 00:01:33,070
when we have somewhat of a compromised

42
00:01:37,830 --> 00:01:35,140
immune system that it gets to do its

43
00:01:41,370 --> 00:01:37,840
thing so how did the experiment work

44
00:01:43,679 --> 00:01:41,380
exactly on station so basically

45
00:01:46,740 --> 00:01:43,689
everything is self-contained the way we

46
00:01:49,469 --> 00:01:46,750
did it and we grew cells in liquid

47
00:01:51,389 --> 00:01:49,479
culture the the differences is just the

48
00:01:52,950 --> 00:01:51,399
technology and the hardware portion of

49
00:01:56,100 --> 00:01:52,960
it so we use what we call tricked-out

50
00:01:57,600 --> 00:01:56,110
test tubes if you will where the in the

51
00:01:59,069 --> 00:01:57,610
within the test tube the cells are

52
00:02:02,190 --> 00:01:59,079
separate from their media and separate

53
00:02:03,390 --> 00:02:02,200
from the sort of fixative agent at the

54
00:02:06,050 --> 00:02:03,400
very end

55
00:02:09,150 --> 00:02:06,060
and the crew member just basically

56
00:02:12,540 --> 00:02:09,160
activates them by turning a crank at

57
00:02:15,690 --> 00:02:12,550
given times to initiate cell growth and

58
00:02:18,240 --> 00:02:15,700
then ultimately to halt cell growth so

59
00:02:20,580 --> 00:02:18,250
we get we got cells back sort of in

60
00:02:22,230 --> 00:02:20,590
these contain tubes some of them had

61
00:02:24,480 --> 00:02:22,240
already been fixed on station we also

62
00:02:26,160 --> 00:02:24,490
got some cells back viable which was an

63
00:02:27,510 --> 00:02:26,170

important part of the experiment we

64
00:02:28,770 --> 00:02:27,520
weren't sure with all the time

65
00:02:31,650 --> 00:02:28,780
constraints whether it's cells would

66
00:02:33,420 --> 00:02:31,660
actually come back viable and in a

67
00:02:34,710 --> 00:02:33,430
position that we could test them once

68
00:02:36,300 --> 00:02:34,720
they got back to the lab and in fact

69
00:02:38,220 --> 00:02:36,310
that worked well so what have we learned

70
00:02:41,400 --> 00:02:38,230
have you learned anything so far oh

71
00:02:44,130 --> 00:02:41,410
we've learned a lot it was our first

72
00:02:45,960 --> 00:02:44,140
exposure to International Space Station

73
00:02:48,720 --> 00:02:45,970
type of research and we flew on space

74
00:02:51,330 --> 00:02:48,730
expedition crs-1 so the learning curve

75
00:02:52,860 --> 00:02:51,340
was steep but scientifically you know

76
00:02:55,170 --> 00:02:52,870
some other things that we predicted were

77
00:02:58,350 --> 00:02:55,180
going to happen did we found that the

78
00:03:01,890 --> 00:02:58,360
yeast was a little bit more resistant to

79
00:03:05,820 --> 00:03:01,900
antifungal agents we also found that it

80
00:03:07,410 --> 00:03:05,830
was a little it it could overcome the

81
00:03:09,780 --> 00:03:07,420
monocytes a little bit when we tested

82
00:03:11,759 --> 00:03:09,790
that we also found some things that

83
00:03:14,430 --> 00:03:11,769
didn't change as we predicted the cell

84
00:03:17,550 --> 00:03:14,440
shape the colony basically when it when

85
00:03:18,990 --> 00:03:17,560
it grows as a colony that structure both

86
00:03:20,699 --> 00:03:19,000
of those structures really weren't as we

87
00:03:22,890 --> 00:03:20,709
predicted but that's why we do the

88
00:03:24,360 --> 00:03:22,900

experiments and that will do it for us

89
00:03:26,130 --> 00:03:24,370
here from the payload operations

90
00:03:27,570 --> 00:03:26,140
integration Center in Huntsville now