
NASA
SPACESTATION
LIVE

1
00:00:09,950 --> 00:00:07,100
we investigated how bacteria react to

2
00:00:12,200 --> 00:00:09,960
antibiotics in space why would you need

3
00:00:14,150 --> 00:00:12,210
to do that in space the reason is

4
00:00:15,830 --> 00:00:14,160
because a series of experiments in the

5
00:00:18,319 --> 00:00:15,840
past have shown several things but one

6
00:00:20,300 --> 00:00:18,329
of them is that if you have a culture of

7
00:00:22,790 --> 00:00:20,310
bacteria on earth and identical one in

8
00:00:24,019 --> 00:00:22,800
space after a few hours whenever you're

9
00:00:26,300 --> 00:00:24,029
done with the experiment you see that

10
00:00:29,089 --> 00:00:26,310
there are more cells in spaceflight than

11
00:00:30,439 --> 00:00:29,099
on earth and similarly another series of

12
00:00:33,139 --> 00:00:30,449
experiments have shown that their

13
00:00:35,479 --> 00:00:33,149

ability to form biofilms is improved in

14
00:00:37,340 --> 00:00:35,489
space and biofilms are associated with

15
00:00:39,380 --> 00:00:37,350
diseases another thing that has been

16
00:00:41,450 --> 00:00:39,390
observed in spaceflight is the their

17
00:00:44,139 --> 00:00:41,460
capability to cause disease in their

18
00:00:45,889 --> 00:00:44,149
host is also enhanced in space and

19
00:00:48,200 --> 00:00:45,899
finally the one that we're really

20
00:00:49,790 --> 00:00:48,210
focusing on on AES one is the fact that

21
00:00:51,380 --> 00:00:49,800
several experiments have seen that you

22
00:00:53,569 --> 00:00:51,390
need higher concentrations of

23
00:00:56,299 --> 00:00:53,579
antibiotics or you need more drugs to

24
00:00:58,849 --> 00:00:56,309
stop bacteria from growing in space so

25
00:01:00,290 --> 00:00:58,859
that is a bunch of bad things if you

26
00:01:01,729 --> 00:01:00,300
were thinking about human space

27
00:01:04,040 --> 00:01:01,739
exploration but actually it's an

28
00:01:07,130 --> 00:01:04,050
opportunity for us to investigate why

29
00:01:08,750 --> 00:01:07,140
and how bacteria are becoming so capable

30
00:01:10,070 --> 00:01:08,760
of surviving concentrations of

31
00:01:11,900 --> 00:01:10,080
antibiotics that on earth would kill

32
00:01:14,750 --> 00:01:11,910
them and that's a that's a good problem

33
00:01:16,130 --> 00:01:14,760
- a good opportunity to try to kill the

34
00:01:18,520 --> 00:01:16,140
bacteria that we currently can't kill

35
00:01:21,470 --> 00:01:18,530
with our drugs so you're talking about

36
00:01:23,390 --> 00:01:21,480
drug-resistant bacteria or what we call

37
00:01:26,570 --> 00:01:23,400
I guess superbugs exactly as Lourdes

38
00:01:28,610 --> 00:01:26,580

that's what we're talking about so right

39
00:01:30,020 --> 00:01:28,620
now in 2015 most people think if I have

40
00:01:31,910 --> 00:01:30,030
a bacterial infection and I go to the

41
00:01:33,920 --> 00:01:31,920
doctor get some antibiotics and it's all

42
00:01:35,660 --> 00:01:33,930
done but in reality there's a problem

43
00:01:37,520 --> 00:01:35,670
the drug resistance problem on earth

44
00:01:39,560 --> 00:01:37,530
that every year is worse as a matter of

45
00:01:40,910 --> 00:01:39,570
fact last year over a hundred thousand

46
00:01:42,740 --> 00:01:40,920
people died from that so just to put

47
00:01:44,720 --> 00:01:42,750
that in measurable human cost in

48
00:01:47,030 --> 00:01:44,730
perspective if this interview is 5 to 6

49
00:01:49,340 --> 00:01:47,040
minutes in length during that duration

50
00:01:50,810 --> 00:01:49,350
one person passed away which is really

51
00:01:52,850 --> 00:01:50,820
heartbreaking as scientists we need to

52
00:01:54,800 --> 00:01:52,860
do something and space-based research is

53
00:01:57,500 --> 00:01:54,810
allowing us to try a different way to

54
00:01:59,510 --> 00:01:57,510
tackle that problem to see how can we

55
00:02:01,490 --> 00:01:59,520
kill these bacteria so now you're

56
00:02:02,960 --> 00:02:01,500
analyzing the data are there any results

57
00:02:04,370 --> 00:02:02,970
you can share with us so far yeah

58
00:02:05,930 --> 00:02:04,380
there's some stuff that we can share for

59
00:02:08,089 --> 00:02:05,940
example we've seen something that had

60
00:02:09,889 --> 00:02:08,099
been reported before that that more

61
00:02:12,410 --> 00:02:09,899
cells grow in space compared to ground

62
00:02:13,290 --> 00:02:12,420
to earth but something that we also have

63
00:02:15,120 --> 00:02:13,300

observed is

64
00:02:17,370 --> 00:02:15,130
the fact that they're very much smaller

65
00:02:18,930 --> 00:02:17,380
in space the e.coli that we grew in the

66
00:02:21,840 --> 00:02:18,940
International Space Station was less

67
00:02:24,450 --> 00:02:21,850
than half in volume is it was 41% in

68
00:02:26,190 --> 00:02:24,460
volume a cell in space when you compare

69
00:02:27,810 --> 00:02:26,200
it to the exact same situation but grown

70
00:02:29,820 --> 00:02:27,820
on earth so that has several

71
00:02:31,830 --> 00:02:29,830
implications on on different processes

72
00:02:33,930 --> 00:02:31,840
but more interestingly than that is that

73
00:02:35,910 --> 00:02:33,940
we have identified specific genes that

74
00:02:37,080 --> 00:02:35,920
are responsible for other series of

75
00:02:39,270 --> 00:02:37,090
processes like the ones we were

76
00:02:41,520 --> 00:02:39,280
mentioning that we are interested in in

77
00:02:43,470 --> 00:02:41,530
continue investigating on AES too and

78
00:02:47,340 --> 00:02:43,480
but also some that are we're ready to

79
00:02:48,960 --> 00:02:47,350
publish so when will we see a es2 we're