



HD

1  
00:00:08,549 --> 00:00:06,470  
future exploration missions are

2  
00:00:10,310 --> 00:00:08,559  
dependent on astronauts having a robust

3  
00:00:12,310 --> 00:00:10,320  
immune system to minimize their risk of

4  
00:00:14,310 --> 00:00:12,320  
infection among crew members

5  
00:00:15,990 --> 00:00:14,320  
an investigation on the space station is

6  
00:00:18,390 --> 00:00:16,000  
studying how microgravity affects the

7  
00:00:20,710 --> 00:00:18,400  
immune system and lori meigs is at the

8  
00:00:22,950 --> 00:00:20,720  
payload operations center at nasa's

9  
00:00:25,670 --> 00:00:22,960  
marshall space flight center to tell us

10  
00:00:27,429 --> 00:00:25,680  
more about that lori well nobody likes

11  
00:00:29,509 --> 00:00:27,439  
to get sick especially when you're

12  
00:00:31,589 --> 00:00:29,519  
hundreds even thousands of miles away

13  
00:00:33,270 --> 00:00:31,599

from a doctor that's why the health and

14

00:00:35,110 --> 00:00:33,280

immune system of crew members on the

15

00:00:37,270 --> 00:00:35,120

international space station is so

16

00:00:39,510 --> 00:00:37,280

important the salivary markers

17

00:00:42,229 --> 00:00:39,520

investigation is looking at the immune

18

00:00:43,990 --> 00:00:42,239

system and the effects that microgravity

19

00:00:45,590 --> 00:00:44,000

may have on it while crew members are in

20

00:00:47,270 --> 00:00:45,600

orbit

21

00:00:48,470 --> 00:00:47,280

the reason we're flying this experiment

22

00:00:50,869 --> 00:00:48,480

is to try and figure out if there are

23

00:00:53,029 --> 00:00:50,879

any clinical risks to the crew members

24

00:00:55,510 --> 00:00:53,039

associated with prolonged spaceflight as

25

00:00:57,830 --> 00:00:55,520

it affects their immune system so we are

26

00:00:59,270 --> 00:00:57,840

we are looking to um

27

00:01:00,790 --> 00:00:59,280

while looking for manned missions to

28

00:01:02,470 --> 00:01:00,800

mars in the future

29

00:01:04,469 --> 00:01:02,480

we know that certain

30

00:01:05,910 --> 00:01:04,479

crew members when they're on board the

31

00:01:07,990 --> 00:01:05,920

the space station or when they flew a

32

00:01:09,350 --> 00:01:08,000

shuttle in the past there is evidence

33

00:01:11,750 --> 00:01:09,360

that their immune systems are

34

00:01:13,590 --> 00:01:11,760

dysregulated we need to ascertain

35

00:01:15,830 --> 00:01:13,600

whether or not these dysregulations in

36

00:01:18,390 --> 00:01:15,840

their immune system uh relate to any

37

00:01:19,270 --> 00:01:18,400

clinical risk before we can um send man

38

00:01:26,630 --> 00:01:19,280

on

39

00:01:28,870 --> 00:01:26,640

with biological samples so we are

40

00:01:29,910 --> 00:01:28,880

collecting saliva urine and blood

41

00:01:31,910 --> 00:01:29,920

samples

42

00:01:33,590 --> 00:01:31,920

from the crew members before they go on

43

00:01:35,590 --> 00:01:33,600

the station when they're on the station

44

00:01:37,830 --> 00:01:35,600

and then we'll also collect samples from

45

00:01:39,190 --> 00:01:37,840

them when they they return to earth

46

00:01:41,030 --> 00:01:39,200

so when they're on the station they have

47

00:01:43,749 --> 00:01:41,040

to give us saliva samples on a daily

48

00:01:45,830 --> 00:01:43,759

basis those saliva samples get frozen on

49

00:01:47,350 --> 00:01:45,840

orbit and whenever the soyuz is

50

00:01:49,749 --> 00:01:47,360

scheduled to return to earth then we

51  
00:01:51,270 --> 00:01:49,759  
collect a blood sample as as soon as the

52  
00:01:53,030 --> 00:01:51,280  
soyuz undocks

53  
00:01:54,950 --> 00:01:53,040  
and then we can analyze analyze that

54  
00:01:56,230 --> 00:01:54,960  
blood sample when the when it's returned

55  
00:01:57,510 --> 00:01:56,240  
to a lab on

56  
00:01:59,190 --> 00:01:57,520  
in houston

57  
00:02:00,630 --> 00:01:59,200  
our experiment is unique because we're

58  
00:02:03,510 --> 00:02:00,640  
able to do a

59  
00:02:06,149 --> 00:02:03,520  
um a very prolonged overview of a single

60  
00:02:07,590 --> 00:02:06,159  
astronauts immune system so in the past

61  
00:02:09,270 --> 00:02:07,600  
samples were collected immediately

62  
00:02:11,190 --> 00:02:09,280  
before flight and immediately after

63  
00:02:13,589 --> 00:02:11,200

flight uh and then of course there were

64

00:02:15,670 --> 00:02:13,599

huge changes documented in many

65

00:02:17,350 --> 00:02:15,680

different immune system parameters but

66

00:02:19,670 --> 00:02:17,360

we weren't sure if these changes were

67

00:02:21,270 --> 00:02:19,680

due to just the stresses associated with

68

00:02:22,869 --> 00:02:21,280

launch and landing now that we're

69

00:02:24,550 --> 00:02:22,879

actually collecting samples on the

70

00:02:26,550 --> 00:02:24,560

station we get we get an idea of what's

71

00:02:27,910 --> 00:02:26,560

happening to the immune system in flight

72

00:02:29,910 --> 00:02:27,920

and we believe that that gives us a more

73

00:02:31,350 --> 00:02:29,920

accurate representation as to what's

74

00:02:32,710 --> 00:02:31,360

happening to the immune system of these

75

00:02:35,509 --> 00:02:32,720

astronauts when they're on the space

76  
00:02:37,190 --> 00:02:35,519  
station for for six months and beyond we

77  
00:02:39,670 --> 00:02:37,200  
know from previous experiments that

78  
00:02:41,670 --> 00:02:39,680  
there is uh evidence of latent viral

79  
00:02:43,270 --> 00:02:41,680  
reactivation so this is when viruses

80  
00:02:45,430 --> 00:02:43,280  
that our body are already infected with

81  
00:02:47,509 --> 00:02:45,440  
they become active again and there is

82  
00:02:49,430 --> 00:02:47,519  
evidence of that from previous

83  
00:02:51,430 --> 00:02:49,440  
flight experiments now what we're trying

84  
00:02:53,270 --> 00:02:51,440  
to do is find out if these latent viral

85  
00:02:55,110 --> 00:02:53,280  
infections actually contribute to this

86  
00:02:57,910 --> 00:02:55,120  
regulated immunity and whether or not

87  
00:03:00,070 --> 00:02:57,920  
that contributes to any clinical

88  
00:03:01,509 --> 00:03:00,080

risk to to the crew member so the

89

00:03:03,270 --> 00:03:01,519

experiment is in the early stages at the

90

00:03:05,030 --> 00:03:03,280

moment but by the time we complete it we

91

00:03:06,070 --> 00:03:05,040

hope to have more more definitive

92

00:03:08,149 --> 00:03:06,080

answers

93

00:03:10,229 --> 00:03:08,159

the space station is ideal because the

94

00:03:12,390 --> 00:03:10,239

the crew members will be uh in

95

00:03:14,470 --> 00:03:12,400

microgravity for at least six months so

96

00:03:16,390 --> 00:03:14,480

it gives us an idea as to how

97

00:03:18,550 --> 00:03:16,400

microgravity or just the the overall

98

00:03:20,229 --> 00:03:18,560

space flight environment can impact the

99

00:03:22,630 --> 00:03:20,239

immune system and this is obviously very

100

00:03:24,949 --> 00:03:22,640

important as we as we prepare for

101

00:03:26,630 --> 00:03:24,959

exploration class missions to to see an

102

00:03:28,390 --> 00:03:26,640

asteroid or mars

103

00:03:30,070 --> 00:03:28,400

um now the the crew members are also

104

00:03:32,789 --> 00:03:30,080

under a lot of stress uh that you know

105

00:03:33,670 --> 00:03:32,799

they're in isolation um

106

00:03:35,589 --> 00:03:33,680

there's a lot of physical and

107

00:03:37,190 --> 00:03:35,599

psychological demands placed on them and

108

00:03:38,789 --> 00:03:37,200

that will impact their immunity so it

109

00:03:40,869 --> 00:03:38,799

does have the have the potential to

110

00:03:42,390 --> 00:03:40,879

benefit terrestrial research on earth

111

00:03:44,550 --> 00:03:42,400

also

112

00:03:46,949 --> 00:03:44,560

dr simpson tells me three crew members

113

00:03:48,949 --> 00:03:46,959

have completed the entire study protocol

114

00:03:52,390 --> 00:03:48,959

and more will as the study goes on it's

115

00:03:53,589 --> 00:03:52,400

expected to be completed in may of 2016.

116

00:03:55,429 --> 00:03:53,599

and you're looking live at the payload

117

00:03:57,750 --> 00:03:55,439

operations integration center busy today

118

00:03:59,589 --> 00:03:57,760

denise morris is the payload operations

119

00:04:01,830 --> 00:03:59,599

director today and they are assisting in

120

00:04:03,270 --> 00:04:01,840

some of those coercing studies in the

121

00:04:04,869 --> 00:04:03,280

microgravity science glovebox that

122

00:04:06,550 --> 00:04:04,879

you've been talking about brandi and

123

00:04:08,470 --> 00:04:06,560

that'll do it for us here at the payload