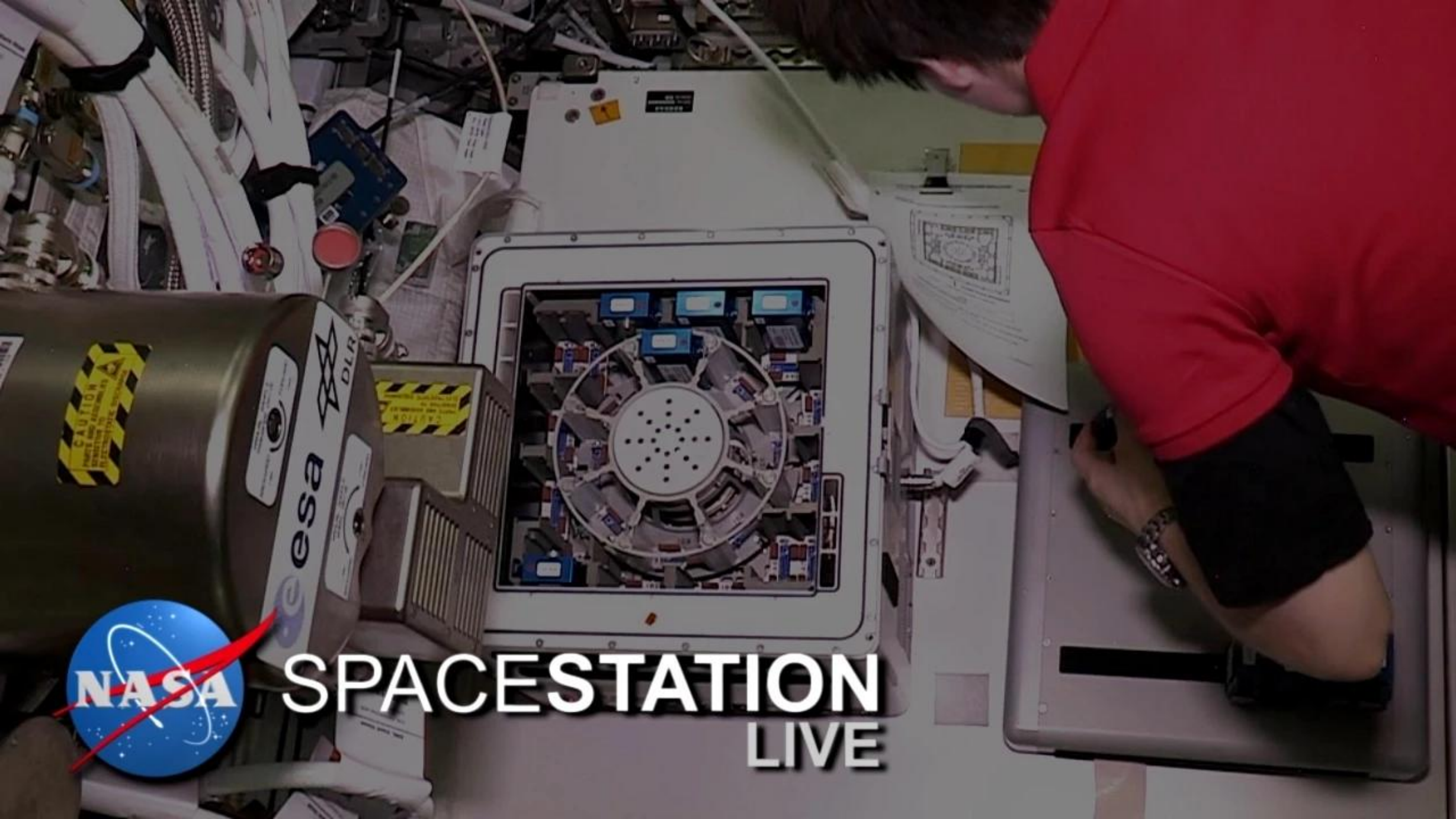
NASA
SPACESTATION
LIVE

1
00:00:11,350 --> 00:00:08,629
we all know that as we age our immune

2
00:00:13,270 --> 00:00:11,360
system may not be as effective as it was

3
00:00:15,829 --> 00:00:13,280
in the past much is the same for

4
00:00:17,750 --> 00:00:15,839
astronauts so a study called t-cell

5
00:00:20,070 --> 00:00:17,760
activation and aging looked at the

6
00:00:22,870 --> 00:00:20,080
suppression of the immune system to find

7
00:00:25,189 --> 00:00:22,880
new ways of boosting our body's defenses

8
00:00:27,429 --> 00:00:25,199
lori meigs is at the payload operations

9
00:00:29,830 --> 00:00:27,439
integration center at nasa's marshall

10
00:00:32,310 --> 00:00:29,840
space flight center with more on one of

11
00:00:36,229 --> 00:00:32,320
the top discoveries on the space station

12
00:00:39,350 --> 00:00:38,069
well dating back to the apollo mission

13
00:00:41,830 --> 00:00:39,360

days it's long been known that crew

14
00:00:44,389 --> 00:00:41,840
members have less immunity to infections

15
00:00:46,470 --> 00:00:44,399
during and after space flight dr millie

16
00:00:49,510 --> 00:00:46,480
hughes-fulford has been studying t-cells

17
00:00:51,590 --> 00:00:49,520
ever since she flew on sts-40 as a

18
00:00:53,670 --> 00:00:51,600
shuttle payload specialist today we

19
00:00:56,069 --> 00:00:53,680
learn more about t-cells and what

20
00:00:58,709 --> 00:00:56,079
fulford's space station experiments have

21
00:01:01,750 --> 00:00:58,719
revealed

22
00:01:03,510 --> 00:01:01,760
your immune system is your century for

23
00:01:06,550 --> 00:01:03,520
keeping you well

24
00:01:07,750 --> 00:01:06,560
the t cell is like the general of all of

25
00:01:08,870 --> 00:01:07,760
the immune

26
00:01:12,149 --> 00:01:08,880
cells

27
00:01:14,630 --> 00:01:12,159
so you get an infection

28
00:01:17,030 --> 00:01:14,640
the t cell is delivered

29
00:01:18,310 --> 00:01:17,040
the antigen saying oh i have an

30
00:01:21,190 --> 00:01:18,320
infection

31
00:01:23,109 --> 00:01:21,200
a couple of actions happen the t cell

32
00:01:25,590 --> 00:01:23,119
then is activated

33
00:01:28,710 --> 00:01:25,600
and it tells the b cell to make

34
00:01:30,230 --> 00:01:28,720
antibodies it tells the macrophage to go

35
00:01:32,630 --> 00:01:30,240
eat up the

36
00:01:35,830 --> 00:01:32,640
the the bacteria

37
00:01:38,469 --> 00:01:35,840
and it is like the general coordinating

38
00:01:41,590 --> 00:01:38,479

the immune system if your

39
00:01:42,789 --> 00:01:41,600
t cell's not working well

40
00:01:45,749 --> 00:01:42,799
you

41
00:01:48,789 --> 00:01:45,759
can die of pneumonia very easily in

42
00:01:51,990 --> 00:01:48,799
the elderly over 65

43
00:01:55,510 --> 00:01:52,000
the top five causes of death in the

44
00:01:58,709 --> 00:01:55,520
elderly one is pneumonia and two is

45
00:02:00,469 --> 00:01:58,719
influenza and it's because the immune

46
00:02:02,149 --> 00:02:00,479
system falters

47
00:02:05,830 --> 00:02:02,159
in older people

48
00:02:08,949 --> 00:02:05,840
i study the immune system in astronauts

49
00:02:11,270 --> 00:02:08,959
and what happens to the t cell

50
00:02:13,190 --> 00:02:11,280
in space flight and why it's not

51
00:02:15,430 --> 00:02:13,200
activating

52
00:02:17,910 --> 00:02:15,440
some of the astronauts have had an

53
00:02:20,710 --> 00:02:17,920
immunosuppression

54
00:02:24,869 --> 00:02:20,720
much like older people i think the most

55
00:02:27,589 --> 00:02:24,879
famous one is on apollo 13 where we had

56
00:02:30,229 --> 00:02:27,599
one astronaut get very ill

57
00:02:32,949 --> 00:02:30,239
with a pseudomonas that normally

58
00:02:34,949 --> 00:02:32,959
wouldn't make you ill on earth

59
00:02:37,110 --> 00:02:34,959
so where are we now we've we've studied

60
00:02:39,990 --> 00:02:37,120
this now on the space station and and

61
00:02:42,150 --> 00:02:40,000
you have results i have results what

62
00:02:43,830 --> 00:02:42,160
we're finding is that there are certain

63
00:02:46,150 --> 00:02:43,840

molecules that are not being made

64
00:02:48,309 --> 00:02:46,160
properly and we're looking at how to

65
00:02:52,630 --> 00:02:48,319
regulate those molecules to turn them

66
00:02:54,630 --> 00:02:52,640
back on the other side collateral

67
00:02:56,390 --> 00:02:54,640
benefit is the fact

68
00:02:59,750 --> 00:02:56,400
that people that have rheumatoid

69
00:03:02,550 --> 00:02:59,760
arthritis people that have multiple

70
00:03:05,110 --> 00:03:02,560
sclerosis also have an autoimmune

71
00:03:07,430 --> 00:03:05,120
disease which means that their

72
00:03:10,229 --> 00:03:07,440
immune system is overacting

73
00:03:12,550 --> 00:03:10,239
so the molecule that we're looking for

74
00:03:16,149 --> 00:03:12,560
to boost the immune system in older

75
00:03:19,270 --> 00:03:16,159
people we can do a anti-mimic or an

76
00:03:22,149 --> 00:03:19,280
inhibitor to help people with

77
00:03:24,309 --> 00:03:22,159
the rheumatoid arthritis to not have all

78
00:03:25,990 --> 00:03:24,319
the pain and to decrease the

79
00:03:28,630 --> 00:03:26,000
inflammation

80
00:03:30,630 --> 00:03:28,640
so now that you have these results how

81
00:03:32,550 --> 00:03:30,640
is that turned into things we can use

82
00:03:35,430 --> 00:03:32,560
okay now that we have the results the

83
00:03:37,910 --> 00:03:35,440
next step is to devise

84
00:03:40,470 --> 00:03:37,920
the mimics and the inhibitors

85
00:03:42,789 --> 00:03:40,480
test them first in the test tube

86
00:03:45,430 --> 00:03:42,799
then go to to

87
00:03:47,990 --> 00:03:45,440
the next step in and looking in normal

88
00:03:50,869 --> 00:03:48,000

people and then the next step after that

89
00:03:52,149 --> 00:03:50,879
is to try it on people with the disease

90
00:03:53,670 --> 00:03:52,159
do you think you would have found this

91
00:03:55,190 --> 00:03:53,680
information had it not been for the

92
00:03:57,270 --> 00:03:55,200
space station and being able to test it

93
00:04:00,309 --> 00:03:57,280
there i don't think so because what

94
00:04:02,710 --> 00:04:00,319
happens is in microgravity we're seeing

95
00:04:05,670 --> 00:04:02,720
things that are not being turned on

96
00:04:08,149 --> 00:04:05,680
and so it's helping us to pinpoint

97
00:04:10,550 --> 00:04:08,159
therapeutic molecules

98
00:04:12,550 --> 00:04:10,560
that can be turned into drugs

99
00:04:15,030 --> 00:04:12,560
will there be more space studies or do

100
00:04:17,990 --> 00:04:15,040
you think you have enough um i i might

101
00:04:19,909 --> 00:04:18,000
do one or two more i i think the final

102
00:04:23,189 --> 00:04:19,919
one will be where i

103
00:04:26,150 --> 00:04:23,199
have the the t cells in flight

104
00:04:28,310 --> 00:04:26,160
and they are immunosuppressed and i add

105
00:04:31,030 --> 00:04:28,320
back my compound and they come back to

106
00:04:33,030 --> 00:04:31,040
normal then i'll be finished

107
00:04:37,590 --> 00:04:33,040
well that'll be a long lustrous career

108
00:04:41,830 --> 00:04:39,909
we don't want to let her retire just yet

109
00:04:43,909 --> 00:04:41,840
we love millie now taking a look live at

110
00:04:46,230 --> 00:04:43,919
the payload operations integration

111
00:04:47,749 --> 00:04:46,240
center we have edwin smith he is at the

112
00:04:48,950 --> 00:04:47,759
helm there the payload operations

113
00:04:50,150 --> 00:04:48,960

director he's actually doing some

114
00:04:51,510 --> 00:04:50,160
on-the-job training to get his

115
00:04:53,270 --> 00:04:51,520
certification

116
00:04:55,909 --> 00:04:53,280
as our newest payload operations

117
00:04:57,749 --> 00:04:55,919
director and the folks there olomisca is

118
00:04:59,749 --> 00:04:57,759
the operations controller

119
00:05:01,270 --> 00:04:59,759
and uh they're all working on all of

120
00:05:02,629 --> 00:05:01,280
those experiments and getting ready for

121
00:05:04,390 --> 00:05:02,639
the new crew that you've been talking

122
00:05:06,469 --> 00:05:04,400
about this morning crawford that'll do

123
00:05:08,390 --> 00:05:06,479
it for us here at the payload operations