



1
00:00:00,146 --> 00:00:02,406
Many of the experiments
that take place

2
00:00:02,406 --> 00:00:05,626
on the International Space
Station require either the use

3
00:00:05,626 --> 00:00:09,276
of -- or actually produce
biological samples.

4
00:00:10,596 --> 00:00:13,016
In order to preserve
these samples for the use

5
00:00:13,016 --> 00:00:15,576
in various tests or
their eventual return

6
00:00:15,576 --> 00:00:17,196
to earth scientist

7
00:00:17,196 --> 00:00:20,686
at the European spaces agency
developed a specialized freezer

8
00:00:20,716 --> 00:00:25,856
rack called MELFI or the minus
80 degree laboratory freezer

9
00:00:25,986 --> 00:00:26,556
for ISS.

10
00:00:28,196 --> 00:00:30,946
Unlike most of the other
research racks aboard the ISS

11
00:00:31,586 --> 00:00:33,596

the MELFI racks are
not actually used

12

00:00:33,596 --> 00:00:35,586
to conduct specific experiments.

13

00:00:36,106 --> 00:00:39,526
They instead store
assorted samples at 39

14

00:00:39,716 --> 00:00:43,686
and minus 112 degrees
Fahrenheit.

15

00:00:43,686 --> 00:00:44,956
Each MELFI rack is made

16

00:00:44,956 --> 00:00:48,086
up of four independently
controlled chambers called

17

00:00:48,156 --> 00:00:51,066
dewers [phonetic] that are
cooled by nitrogen gas.

18

00:00:52,146 --> 00:00:56,786
Each dewer contains four trays
that can hold up to 175 liters

19

00:00:57,056 --> 00:01:00,616
or 85 kilograms of
plants, cell cultures,

20

00:01:00,806 --> 00:01:02,986
or human tissue and
fluid samples.

21

00:01:04,246 --> 00:01:07,136
The plant specimens from the
advanced biological research

22

00:01:07,136 --> 00:01:09,716
system growth module
are stored in one

23

00:01:09,716 --> 00:01:11,766
of the stations three
MELFI racks.

24

00:01:13,246 --> 00:01:15,626
Because one of the
primary areas of study

25

00:01:15,626 --> 00:01:20,076
on the ISS is human physiology
MELFI stores human samples

26

00:01:20,256 --> 00:01:22,986
like blood, saliva,
hair, and urine.

27

00:01:24,286 --> 00:01:26,836
Properly preserved blood
and urine are necessary

28

00:01:26,836 --> 00:01:29,246
for accurately conducting
nutritional studies

29

00:01:29,496 --> 00:01:32,066
and cardio vascular
system experiments.

30

00:01:32,656 --> 00:01:36,156
Hair samples used in the study
of micro gravities effect

31

00:01:36,156 --> 00:01:39,366
on metabolism and gene
expression require the MELFI

32

00:01:39,366 --> 00:01:41,826
continuously monitored
low temperature

33

00:01:42,246 --> 00:01:43,606
for accurate results.

34

00:01:44,846 --> 00:01:46,736
Thanks to the MELFI racks
in the Keybo [phonetic]

35

00:01:46,736 --> 00:01:50,196
and Destiny laboratories
astronauts aboard the ISS can