

3.9 Experiment M113. Blood Volume and Red Cell Life Span

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Experiment M113 was designed to determine the effect of earth orbital missions on plasma volume and red blood cell populations (particularly changes in red cell mass, red cell destruction, red cell life span, and red cell production rate), and to provide baseline data for correlation with data from other hematologic and immunologic experiments.

Preliminary Scientific Report as of R+14 Day

The major changes of experiment data from the preflight baseline are as follows:

- Mean red cell mass decreased about 14%.
- Plasma volume decreased 10% in Kerwin with insignificant changes in Conrad and Weitz.
- Mean hematocrit decreased 7%.

No other data available at this time.

Analysis

Comparative interpretation of the changes with SMEAT and/or the past manned space flights data are as follows:

Drop in red cell mass and hematocrit are greater than the mean changes seen in Apollo and greater than was recorded in SMEAT.

	<u>SMEAT</u>	<u>Apollo 14-17</u>	<u>SL 1/2</u>
Red Cell Mass	-2.7	-10.1 ±1.3	-14.0
Plasma Volume	+1.6	- 4.4 ±1.7	- 3.4
Peripheral Hematocrit	-4.3	+ 0.1 ±0.9	- 6.6

Again, space flight is associated with changes in blood volume. Data are not available yet to determine if this was a hemolytic event or inhibition of erythropoiesis. Mean plasma volume changed less than in bedrest.

The G-suit did not seem to affect Kerwin's plasma volume as it did Evans (Apollo 17).

No P/C measure available for RBC change. !

This change should not cause a medical problem in a 56 day mission. !?

Haptoglobin binds free Hgb in in vitro hemolysis. No change.

Miss test will cause ↑.

No erythropoietin yet.

Infl't Hgb. -

	Infl't.	Pre	Post
Jan	14.1	14.7	13.4
	L+14		

Rec:

Lowry to do elec. on 0.5 ml samples.

modify immunoel - cong. lysosome, haptoglobin alpha 2 macro.

Endocrine

ADH
angio I
ACTH
Hgh cut

osmol.
Prest-hormone.