



MEMORANDUM

Lyndon B. Johnson Space Center



REFER TO: CB	DATE May 23, 1983	INITIATOR CB/JAResnik/cgh:5/23/83:2221	ENCL
TO: CB/H. W. Hartsfield CB/S. A. Hawley CB/W. B. Lenoir CB/W. E. Thornton		CC	
FROM: CB/J. A. Resnik		SIGNATURE J. A. Resnik  	
SUBJ: Student Experiment: Healing of Bone Fractures			

On May 23 I attended the CDR for a student experiment on the effects of weightlessness on the healing of bone fractures. This experiment was potentially scheduled for STS-12 prior to this meeting; however, the investigators want 7 days on orbit, and 6 days at the minimum, so it might be postponed to STS-14. The following is a brief summary of pertinent information.

Four or five male rats will be surgically prepared approximately 2 days prior to launch with bilateral fibular osteotomies under anesthesia (i.e., an incision will be made in both hind legs of each animal, and a little bone saw will be used to create the fracture). The fibula is not a weight-bearing bone and will require no splints, crutches, or wheelchairs. Other than the fractures, the animals will be healthy and have no obvious disabilities. The experiment will demonstrate the soft healing process which occurs during the first 7 days after an injury. The animals will be sacrificed post-flight and autopsied, following x-rays, blood counts, etc. A parallel experiment will be run at KSC during the flight with similarly prepared animals as a control. The experiment is proposed by Andrew Fras and sponsored by Dr. Jack Sweeney of USC, and the hardware is developed by General Dynamics.

These rats will be flown in the same cage used for a DSO on STS-8 (with six healthy rats) and also for an unrelated student experiment on STS-11 (with three drug-induced arthritic rats and three healthy rats). For comparison purposes, these rats will be approximately 350 grams each; the STS-8 rats will be 200 grams. The cage is totally sealed with four fans and associated charcoal filters, etc., to circulate cabin air internally and exhaust back to the cabin. The STS-8 and -11 experiments will include potato pellets to feed the little critters; this experiment will contain a water bottle instead, filled with 1000 cc and built with two little nipples as the rats' access (no snotty comments, please). The experiment will remain sealed for the entire flight under all circumstances. The cage has been demonstrated to exude no orders or toxic matter with six dead rats for 10 days at full fan flow, or so they say.

The cage is built to substitute for a mid-deck locker and will require 28 volt dc power from a mid-deck outlet, both of which (lockers and outlets) STS-12 is overbooked. There are switches for the fans and for a light to create a day-night cycle. The fans will presumably be on for the entire mission; the crew

will have to cycle the light every 12 or so hours. The sponsors also want three separate 20-minute video tapes of the rats on three separate days, to see how (or if) they move, how they acclimate to zero-g, and general activity which might affect healing.

It will be at least a month before this experiment is taken to the MICB for official baselining on a specific flight.