is the most active site of absorption of monosaccharides in the small intestine (*10*).

Our data demonstrate the adaptive nature of several galactose-metabolizing enzymes (galactokinase, galactose dehydrogenase, uridyltransferase, and uridine diphosphate galactose 4-epimerase) in the jejunum of rats. These results, coupled with previous observations on certain jejunal glycolytic enzymes (*2*), provide a convenient model for studying the regulation of intestinal enzymes in vivo.

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Transmission of Experimental Kuru to the Spider Monkey (Ateles geoffreyi)

Abstract. *Clinical signs and pathological changes characteristic of kuru in man and experimental kuru in chimpanzees were observed in two spider monkeys,* Ateles geoffreyi, *after inoculation with brain tissue from a kuru-affected chimpanzee. The incubation period for one of the monkeys was 23 months, and 26 months for the other.*

A clinical syndrome remarkably similar to kuru in man (*1*) and experimental kuru in chimpanzees (*2*) appeared in two spider monkeys (*Ateles geoffreyi*) 23 and 26 months, respectively, after inoculation of each animal with brain tissue from a chimpanzee (*Pan satyrus*) with experimentally induced kuru. The syndrome, with progressive cerebellar ataxia, incoordination, and tremor, has not been seen as a spontaneous disease of any monkeys in our own or other laboratories. It closely mimicked the clinical pattern of kuru in man and the chimpanzee and progressed to severe incapacitation in 6 months. Similar inoculation of a suspension of brain from the same chimpanzee into nine rhesus (*Macaca mulatta*), one cynomolgus (*Macaca irus*), six African green (*Cercopithecus aethiops*), two squirrel (*Saimiri sciurea*), and one patas (*Erythrocebus patas*) monkeys has produced no disease after 30 months; inoculation into a chimpanzee produced kuru in 11 months.

On 9 February 1966, chimpanzee A-1 was killed in the advanced stage of experimental kuru, 30 months after intracerebral inoculation of a suspension of human brain from a patient who had kuru (see *2*). Chimpanzee brain tissue was ground to a 20 percent suspension in isotonic physiologic phosphate-buffered saline, *p*H 7.4, and the homogenate was clarified by centrifugation at 1500*g* for 30 minutes. Male (S-1) and female (S-2) adult spider monkeys were each inoculated with a 10 percent suspension of brain as follows: 0.2 ml intracerebrally into the left frontal cortex, 0.2 ml intravenously, and 0.1 ml subcutaneously.

In spider monkey S-1, apathy and decreased activity were first noted 23 months after inoculation. Over the next 3 months he became progressively more slow, deliberate, and cautious in his movements; during the 3rd month of clinical disease he developed intermittent, shivering truncal tremors and poorly coordinated hand movements, with bilateral dysmetria and coarse intention tremor of the upper extremities. By the 5th month of overt disease he had become thin and shabby. Incoordination of the extremities became more severe, and, although the animal could still use his hands, he was frequently observed to eat from the floor by leaning forward and taking food directly into his mouth. Gait was slow, swaying, and ataxic; he rarely attempted to climb and, while sitting, exhibited truncal titubation. No ataxia was noted in the prehensile tail.

During the animal's last week of life there was continual drooling of saliva. No other abnormalities were noted except for a left dorsal scoliosis. The facial expression was normal (without the lip droop seen in kuru-affected chimpanzees). Cranial nerve functions appeared normal. There was no focal weakness of the limbs or evidence of spasticity or rigidity; deep tendon reflexes were normal, and both plantar responses were flexor. Touching of the lips provoked a rooting response.

Throughout illness S-1 remained alert and friendly and had a good appetite. At no time was there evidence of any systemic illness. There were no convulsions or fever. Findings in hematological and chemical studies of blood did not differ significantly from normal human values. On 10 July 1968, 6 months after onset of illness, the animal was anesthetized and surgical biopsies of the frontal and occipital cerebral cortex were performed to obtain tissue for electron microscopic study; the animal was then killed by exsanguination.

The brain and other organs were grossly normal. Preliminary histopathological studies show intense, diffuse status spongiosus of cerebral gray matter with marked astroglial hypertrophy and neuronal loss with vacuolation of neurons—a picture remarkably similar to that in the chimpanzee with experimental kuru (*3*). More extensive neuropathological findings will be presented elsewhere.

Twenty-six months after inoculation, spider monkey S-2 was first noted to have become slow and clumsy. A month later she exhibited intermittent truncal titubation and fine tremors of the extremities. Disease continued to progress in essentially the same course as that of S-1. By the time she was killed, 4 months after onset, S-2 had severe ataxia of gait, with dysmetria, incoordination, and coarse intention tremors of all limbs and tail. She showed a marked startle in response to loud noise and light touch. Clinical signs were otherwise the same as those of S-1. Brain biopsies and autopsy were performed as for S-1, and the brain and other organs were grossly normal. Preliminary histopathological studies showed the same findings as those of S-1.

Until recently only two other spider monkeys were inoculated with kuru tissue: one, S-3, was inoculated 12

months ago intracerebrally with 0.2 ml of human brain from a patient who had kuru (Sepe), and the other, S-4, was inoculated 16 months ago intracerebrally with 0.2 ml of a 10 percent suspension of brain from chimpanzee A-16 (*2*), affected with experimental kuru. No illness has yet been observed in either of these animals. When the first two animals (S-1 and S-2) developed unmistakable signs of kuru, human brain tissue from six other patients with kuru, and brain tissue from three kuru-affected chimpanzees (including chimpanzee A-1) were inoculated into 12 additional spider monkeys.

The common term spider monkey refers to animals of some six species in two families of New World monkeys. The two animals used were apparently of the species *Ateles geoffreyi*, of which there are over a dozen varieties. Spider monkeys of other species and varieties are also being used in order to determine the host range of susceptibility within the group of New World monkeys. In addition, over a dozen other species of monkeys (including four New World) and one chimpanzee have been inoculated with the brain of S-1.

Since the evolution of disease after primary inoculation required more than 2 years, there may be considerable delay before additional cases of kuru in the spider monkey can be reported, unless, as in the chimpanzee, there is a significant shortening of incubation period on secondary passage. Spider monkeys are considerably less expensive and easier to obtain in large numbers than are chimpanzees, which have been the only known susceptible host for study of kuru. Their use should considerably facilitate characterization of the virus and study of the pathogenesis of the disease.

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Amyloidosis Induced in Mice by Escherichia coli Endotoxin

Abstract. *Amyloidosis was produced in mice by repeated subcutaneous injections of 0.5- or 0.005-milligram amounts of* Escherichia coli *endotoxin. Of the two strains of mice examined, amyloidosis was induced more readily in one than in the other. The ability of endotoxin to induce amyloidosis lends support to the view that stimulation of reticuloendothelial cells leads to amyloid formation.*

Amyloid is a homogeneous, eosinophilic, fibrillar glycoprotein with characteristic morphological and tinctorial properties (*1*). It is deposited in the tissues of man and animals under a variety of clinical and laboratory conditions and has been induced experimentally with multiple agents and methods varying from the administration of live or killed bacteria to repeated injections of proteins, such as casein (*1*). Superficially, these procedures have little in common and make most difficult any unifying hypothesis regarding pathogenesis. This preliminary report describes the successful induction of amyloidosis in two strains of mice by repeated administration of *Escherichia coli* endotoxin.

Escherichia coli (O127:B8) endotoxin was obtained from Difco Laboratories (*2*). The endotoxin was dissolved in phosphate-buffered saline at a concentration of 2.0 mg/ml and frozen at −20°C until it was used. Six-week-old male mice, C_3H/Hen and White Swiss (G.P.), obtained from the animal production section, National Institutes of Health, were used for the experiments.

Table 1. Splenic amyloid in C_3H/Hen and G.P. mice after administration of *Escherichia coli* endotoxin.

Endotoxin	Strain	No of mice	Daily dose (mg)	No. of injections	No. of mice with splenic amyloid*
Lot 1	C_3H/Hen	10	0.005	15	0/10
	C_3H/Hen	6	.005	30	0/6
	C_3H/Hen	10	.5	15	0/10
	C_3H/Hen	17	.5	30	2/17
	G.P.	11	.005	25	4/11
	G.P.	10	.5	25	10/10
Lot 2	G.P.	6	.5	15	6/6
	G.P.	16	.5	20	16/16
Phosphate-buffered saline	G.P.	10	.25 ml	25	0/10

* Results are given as No. mice with amyloid/No. injected.

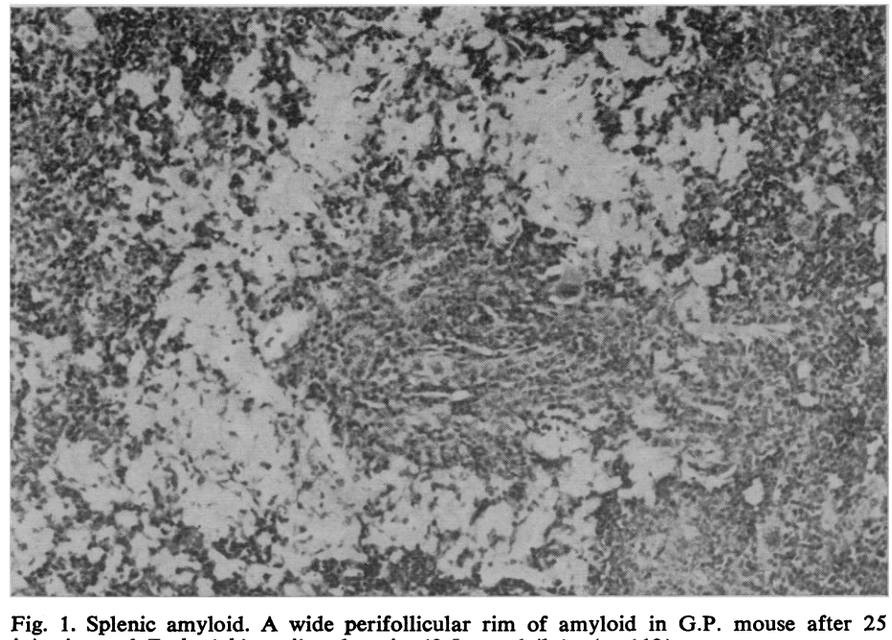

Fig. 1. Splenic amyloid. A wide perifollicular rim of amyloid in G.P. mouse after 25 injections of *Escherichia coli* endotoxin (0.5 mg daily). (× 112)