When diabetes mellitus is detected in the human subject, one of the patient's first questions will concern the cause of the disease. While there is no satisfactory answer, most certainly heredity will be mentioned as one of the major factors. Yet, it is quite difficult to conduct an objective study into the heredity of diabetes in man, because adequate records of the incidence of the disease in the era prior to the discovery of insulin are scarce. Only forty some years have passed since the introduction of insulin, a time not producing a sufficient number of generations to perform meaningful studies on the hereditary occurrence of diabetes. In domestic animals diabetes does occur spontaneously, but it is so rare — 1 in 1000 — that any kind of systematic study over several generations is impossible.

In order to study the disease, scientists have tried for a long time to produce diabetes experimentally by various means in animals. The experimentally produced diabetes does not closely resemble spontaneous human diabetes. Consequently there has been a great need for an animal species, which would not only develop spontaneously diabetes but where the disease would be hereditary and present itself with the same symptoms as in man.

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CHINESE HAMSTERS AND DIABETES MELLITUS

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Chinese Hamsters and Diabetes Mellitus. When in a human subject a diagnosis of diabetes is made, one of the patient's first questions will concern the cause of the disease. While there is no satisfactory answer, most certainly heredity will be mentioned as one of the major factors. Yet, it is quite difficult to conduct an objective study into the heredity of diabetes in man, because adequate records of the incidence of the disease in the era prior to the discovery of insulin are scarce. Only forty some years have passed since the introduction of insulin, a time not producing a sufficient number of generations to perform meaningful studies on the hereditary occurrence of diabetes. In domestic animals diabetes does occur spontaneously, but it is so rare — 1 in 1000 — that any kind of systematic study over several generations is impossible.

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Data di arrivo in Redazione 5-11-1964.
filled in a little rodent, Cricetulus griseus, the Chinese or Striped-Back Hamster. This animal was introduced as a potential laboratory rodent for cytogenetic studies because of its low chromosome number. In addition it was found that the cheek pouch of the hamster was a very good site for tissue transplants. For these reasons scientists at the Childrens Cancer Research Foundation in Boston domesticated a wild Chinese hamster species brought from the vicinity of Peking, China.

The Chinese hamster is a small animal with brownish grey fur and a longitudinal dark stripe on its back. It weighs about 0.5 g when born, and about 40 g when mature. Its normal life span is 30 to 48 months. In nature, the Chinese hamster lives alone throughout its life-time; only during mating-time and when competing for food does the animal get in contact with other hamsters. The females from the same litter reach sexual maturity sooner than the males, this prevents in nature any brothersister mating. As many other rodents, the hamsters are bedding down during the day-time and become active and lively at night-time. When brought into the laboratory, the Chinese hamster proves to be a very neat, clean and odorless animal. It feeds on customary laboratory chow with an occasional addition of bits of juicy vegetables like potatoes, carrots etc.

In order to overcome experimental variability and get a better acceptance of tissue transplants, the scientists were inbreeding the animals. During this phase of domestication and inbreeding a genetic mutation manifested itself as spontaneous hereditary diabetes mellitus. This was first observed in the 3rd-4th brothersister generation: some of the animals were putting out large quantities of peculiarly smelling urine, their cages were all the time wet and diabete spontaneo nell'animale si è concretizzato in un piccolo roditore, il Cricetulus griseus, ovverosia il Chinese o Striped-Back Hamster. Questo roditore era stato proposto come animale di laboratorio per studi citogenetici a causa del suo limitato numero di cromosomi. Inoltre era stato notato che la tasca delle sue guance rappresentava un'ottima sede per trapianti di tessuto. Per questi motivi i ricercatori della Childrens Cancer Research Foundation di Boston addomesticarono una specie selvatica di Chinese Hamster importato dai dintorni di Pechino in Cina.

Il Chinese Hamster è un piccolo animale dal pelo grigio-bruniccio con un segno scuro longitudinale sopra il dorso. Il suo peso è di circa 0,5 g alla nascita e di circa 40 g in età adulta. Normalmente la sua vita è lunga 30-48 mesi. Quando è in libertà, il Chinese Hamster vive da solo tutta la sua vita e viene in rapporto con i suoi simili solo nel periodo dell'accoppiamento e quando deve procurarsi il cibo. Le femmine raggiungono la maturità sessuale prima dei maschi della stessa covata e ciò previene in modo naturale gli accoppiamenti tra fratelli e sorelle. Come molti altri roditori, gli Hamsters durante il giorno se ne stanno a dormire e tornano ad essere attivi e vivaci durante la notte. Allevato in laboratorio il Chinese Hamster si dimostra un animale grazioso, pulito e senza odore. Esso si nutre con il comune cibo di laboratorio, con l'aggiunta occasionale di pezzetti di vegetali sugosi come patate, carote, etc.

Allo scopo di scoprire la possibilità di variazioni sperimentali ed ottenere un migliore attecchimento dei trapianti di tessuti, i ricercatori allevarono gli animali per generazioni. Durante questa fase di addomesticamento e di allevamento, per una mutazione genica si manifestò un diabete mellito spontaneo ed ereditario. Esso venne osservato per la prima volta nella 3°-4° generazione: alcuni animali eliminavano di continuo una grande quantità di urine particolar-