concentration was followed by the partial de-inhibition of the enzyme. In capillaries response was slow; there was almost linear inhibition of the enzyme with increasing concentrations of sodium. It is clear that microvessel HK is less sensitive to the ionic changes, while parenchymal HK response favors demands for enhanced energy production after neuronal firing when intracellular potassium is lowered and sodium increased.

Figure, F. The further evidence that microvessel HK is less sensitive to the ionic changes, came from the fact that this enzyme was insensitive for the changes in pH, while parenchymal HK activity decreased with the increase of pH from 6.5 to 7.5. One can speculate that this could be related to the some trigger mechanism for the glycolysis, particularly in the case of lactate accumulation. In hepatic cells, lactate serves as a signal for enhanced glycolysis[7].

From our data, microvessel and parenchymal hexokinase are clearly distinguished enzymes, at least kinetically. Our attempt to reveal isoenzyme differences of 2 HK's using acrylamide disc electrophoresis was not successful. However, one must be aware of the complex nature of brain HK, for it is known that it is mainly particle-bound enzyme[8,9]; in our preparation about 60% of the total HK activity was particle-bound. Hence, HK may play some additional roles besides generating G-6-P for glycolytic pathways[10]. In parenchyma, its main function is to increase energy production when the cell demands it, and its kinetic properties are in agreement with this function. In microvessels the function of HK seems to be different. Endothelial cell itself has not great energy demands[3,5]. Hexokinase, therefore, may be incorporated in the glucose transport system through endothelial cell along with glucose-6-Pase[3]; excess of G-6-P not metabolized by endothelial cell itself may be hydrolized via glucose-6-Pase reaction and glucose released in juxtaposed glial cell. The nature of glucose carrier through membranes of endothelial cells remains to be elucidated, but there is evidence that transport of glucose into capillaries is saturable with K_m-values very close to microvessel hexokinase K_m (figure, A)[1]. However, whether different kinetic properties of the enzyme are related to the specific functions of the cell remains to be established. This could be of particular interest for the endothelial cell, most likely to be a site of blood-brain barrier.

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Inheritance of four characters in *Dolichos lablab* L. (Leguminosae)

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Summary. Trigenic ratios have been reported for the first time for the following characters: Habit of the plant, inflorescence type, pod form and pod colour. The first two characters show the presence of 3 common genes and the latter ones are independent.

Dolichos lablab L. (*Lablab niger* Medic., Syn. *Lablab purpureum* sweet), a climbing annual, is popularly known as field-bean. However, systematic crop improvement has not been done. Hence, a program on genetic improvement of this crop through germplasm collection, evaluation and hybridisation has been taken up by the Department of Agricultural Botany, University of Agricultural Sciences, Hebbal, Bangalore.

The 2 varieties, *Hebbal Avare-1* and *Ginnu,* were crossed and F_1, F_2 generations were studied. *Hebbal Avare-1* is a variety released at the University of Agricultural Sciences, and *Ginnu* is a locally cultivated variety around Bangalore. *Hebbal Avare-1* is erect in plant habit with the racemose type of inflorescence (florets borne on the erect floral axis), the pod is flat and white in colour. *Ginnu* is twining in habit with the flowers borne in clusters at the nodes (in the axil of every leaf), pod inflated and green in colour.

The data on parents, F_1 and F_2 are given in table 1. The F_1

Table 1. Characters of parents, F_1 and F_2 segregation of the cross *Hebbal Avare-1* (P_1) × *Ginnu* (P_2)

Characters involved in crosses		F_1		F_2	Ratio	χ^2	p
Habit	P_2 twining P_1 erect	Twining	dom. rec.	872 345	45:19	1.04	0.4–0.3
Inflorescence	P_2 axillary cluster P_1 terminal long-stalked	Cluster	dom. rec.	868 349	45:19	0.59	0.5–0.4
Pod form	P_1 flat P_2 inflated	Flat	dom. rec.	1068 149	57:7	2.13	0.2–0.1
Pod colour	P_2 green P_1 white	Green	dom. rec.	1195 22	63:1	0.47	0.5–0.4

Table 2. Joint segregation for different characters in F_2 generation

Characters		XY	Xy	xY	xy	χ^2	p
Habit (45:19) and inflorescence type (45:19) (3 genes common)	Obs.	869.0	3.00	0.00	345.00	3.9420	0.30–0.20
	Exp.	855.70	0.00	0.00	361.30		
Habit and pod form (57:7)	Obs.	769.00	103.00	299.00	49.00	4.8950	0.20–0.10
	Exp.	762.11	93.59	321.78	39.52		
Habit and pod colour (63:1)	Obs.	855.00	17.00	340.00	5.00	1.9274	0.70–0.50
	Exp.	842.33	13.39	355.65	5.65		
Inflorescence type (45:19) and pod form (57:7)	Obs.	766.00	102.00	302.00	47.00	3.4039	0.50–0.30
	Exp.	762.11	93.59	321.78	39.52		
Inflorescence type and pod colour (63:1)	Obs.	851.00	17.00	344.00	5.00	1.5187	0.70–0.50
	Exp.	842.33	13.39	355.65	5.65		
Pod form (57:7) and pod colour (63:1)	Obs.	1050.00	18.00	145.00	4.00	3.6278	0.50–0.30
	Exp.	1066.95	16.93	131.02	2.07		

was twining in habit with the flowers borne in the axils of every leaf, and with flat pods, green in colour. The F_2 population consisted of 1217 plants and the observations were recorded on the following characters: Habit of plant, inflorescence type, pod form, and pod colour. Ratios obtained for various characters indicate the interaction of 3 pairs of factors. Habit of the plant and the type of inflorescence both segregated in the ratio of 45:19 indicating that 1 gene is basic and the remaining 2 are complementary duplicates in action. A ratio of 57:7 was realized for the form of the pod suggesting the interaction of 1 independent dominant gene and complementary action of remaining 2 genes. Colour of the pod is governed by 3 duplicate factors giving 63:1 ratio. Analysis of the combined ratios (table 2) applied for colour and form of the pod showed that they are independent and did not show association with plant habit and inflorescence type. But the plant habit with inflorescence type showed the presence of 3 genes common for both these characters with a modified ratio of 45:0:0:9. D'Cruz and Ponnaiyya[2], Rangaswamy and Nambiar[3,4] observed monogenic segregation for pod form and pod colour. Meenakshi and Sundaresan[5] reported digenic ratio for pod colour. But in the present investigation, trigenic ratios have been reported for these 2 characters. Habit of the plant and inflorescence type are also governed by 3 pairs of factors (45:19), the gene symbols may be designated as T_h for twining plant habit and A_x for axillary inflorescence respectively. The trigenic ratios have been reported here for the first time for the above-mentioned characters.

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Cytological and genetic localization of a Y-autosome translocation in an Australian strain of the housefly, *Musca domestica*

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Summary. The Australian housefly strain *KIN* lacks a separate Y-chromosome and both males and females have 2 X-chromosomes. Genetic analyses showed the presence of the male-determining factor on autosome II, while cytological analyses demonstrated that part of the Y-chromosome has become attached to the same autosome. The Y-chromosome material is thus indicated as the site of the male-determining factor in this strain.

Translocations involving the Y-chromosome and any of the 5 autosomes of the housefly chromosome complement can be induced by X-rays[2]. Where chromosome IV is involved, the resulting experimental strain has 2 X-chromosomes in both sexes, with the males carrying the remainder of the Y-chromosome[2]. However, in naturally occurring strains in which the males carry 2 X-chromosomes (termed holandric), no Y could be found, nor could any Y-material be detected cytologically on the autosome showing sex-linkage[3]. Hiroyoshi[3] suggested that a male-determining factor and a viability factor were both attached to autosome-III with subsequent loss of the Y-chromosome. Kerr[4], on the other hand, found sex-linkage of autosome-II markers in a Canberra, Australian strain, and found that males showed both X-chromosomes, but was unable to detect any Y-material.

We analyzed an Australian strain, *KIN*, both genetically and cytologically in crosses with reference strains (table 1). We found sex-ratios not differing significantly from 1:1 for all within-strain crosses and crosses between-non-Australian strains, and, in these cases, within-mutant classes. However, we also found marked viability effects for a