more typical mitosis is observed. For certain developmental stages of *Neurospora*, a facultative mechanism of longitudinal division of filamentous nuclei as advanced be KEEPING[6] and WEIJER et al.[4] must therefore be considered[7].

Résumé. La différenciation conidienne de *Neurospora crassa* s'accompagne de divisions nucléaires dans les hyphes en constriction jusqu'à l'achèvement de la septation inter-conidienne. Dans les hyphes étroits conidiogènes, les figures mitotiques sont souvent très étirées et peuvent correspondre à un autre mécanisme de division nucléaire que celui, plus classique, des conidies en germination.

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High Frequency of Mast Cells in Spleens of A-Strain Mice

Mast cells are most frequent in the connective tissues of animals of various species, while in lymphoid tissues their incidence is much more limited[1,2]. Comparison of the relative frequency of mast cells in different animals' spleens[3] showed that they are abundant both in the capsule and parenchyme of cows, calves, sheep, dogs and horses, while in pigs and rabbits they are much less frequent and in rats practically absent. Negative findings of mast cells in the spleen were reported in rats and rabbits[4] and in the hedgehog[5]. A small amount of mast cells was observed in the red pulp of mouse spleen[6].

In the present paper, the finding of an exceptional abundance of mast cells in the spleen of inbred mice of a few genetically related strains, in contrast to their extremely low frequency in several other mouse strains, is described. The strongly positive strains are the A-strain (which has been maintained by strict brother-sister mating in Prague from 1956, when a few breeding pairs were kindly provided by Dr. N. A. MITCHISON, Edinburgh, and which is now denoted A/Ph) and its presumably congenic line A.CA. Comparison was made with the incidence of mast cells in the spleen and thymus of mice of several other strains; furthermore, spleens of rabbits, rats, chickens and ducks were investigated with a negative result.

After killing the animal by cervical dislocation, the respective organs were fixed overnight with 4% formol in McIlvan buffer solution at pH 3.8; the tissues were then cut into 10 μ thick sections on a freezing microtome. Selective staining of mast cells was performed by toluidine blue (0.5% solution, 10 min at pH 2.0). To control the technique, some sections of A/Ph mouse spleen were submitted, as a rule, to the same procedure while staining tissues of the 'negative' strains. The number of mast cells/mm^3 of tissues was calculated according to the following formula by FLODERUS[7]: $x = n(1000/a + d - 2h)$, where n = the number of mast cells counted in 1 mm^3, a = thickness of the section (10 μ in this case), d = the average diameter of the mast cell (taken as 5 μ), and h = the diameter of the smallest nucleated segment just resolvable under given conditions of microscopic observation (0.3 μ).

Table I gives the average values of this parameter (each based on 8–10 animals) for 2- to 4-month-old mice of several strains. In Table II, 5 additional mouse strains

Table I. Comparison of mast cell frequency in spleen of mice of various strains (average values from 8–10 mice)

Strain	No. of mast cells/mm^3 of spleen	Strain	No. of mast cells/mm^3 of spleen
A/Ph	26,042 ± 667	C57BL/10	264 ± 41
A.CA	23,125 ± 227	C57BL/6	90 ± 21
A.SW	2,430 ± 204	B10 BY	521 ± 233
CBA/J	111 ± 14	B10 D2	354 ± 37
CBA/T6T6	111 ± 29	B10 Y	264 ± 43
C3H	194 ± 35	B10 A	174 ± 26
PCTL	28 ± 20	B10 AR v	139 ± 27
LPR III	56 ± 23	B10 LP	90 ± 22
NZB	90 ± 44	B10 AR II	28 ± 21
H	347 ± 62		

Table II. Individual values of the frequency of mast cells in mice of various strains

Strain	No. of mast cells/mm^3 of spleen		
	1	2	3
C3H/NB	0	0	56
C3H.K	264	90	285
R III	90	139	56
B10 BR	56	397	397
B10 M	111	347	370

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are characterized in this way, each value being based on 3 animals only.

The mast cells are localized exclusively in the red pulp (Figure 1); they have a spherical or spindle-shaped form and their granules are stained metachromatically by toluidine blue. The individual variability of their specific content in the spleen is very likely due to their high sensitivity to various stimuli during both the animal's life and the histological procedures. The effect of sex was not observed.

A limited number of F_1 and F_2 hybrids, between 2 strains fairly contrasting in this character, were also tested. In (A/Ph × C57BL/10ScSn) F_1 mice, the incidence of mast cells was increased as compared to the 'weak' parental strain C57BL. None out of 40 tested F_2 hybrids were fully comparable with the strongly positive parental strain A/Ph. In 19 animals the values of the parameter fall within the range characteristic for the weak parents; they are slightly increased in 19 and markedly increased in 2 F_2 hybrids. Hybrids between A/Ph and the practically negative strains are being prepared for further analysis.

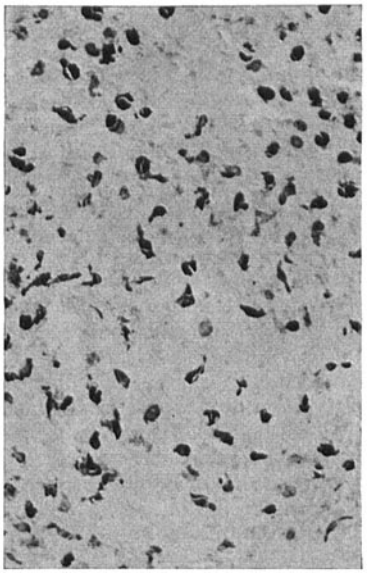

Fig. 1. A typical picture of the frequency of mast cells in the spleen of A/Ph strain mice; a corresponding field of view in the negative strains contains less than 1 cell on the average. (Toluidine blue 10 × 16.)

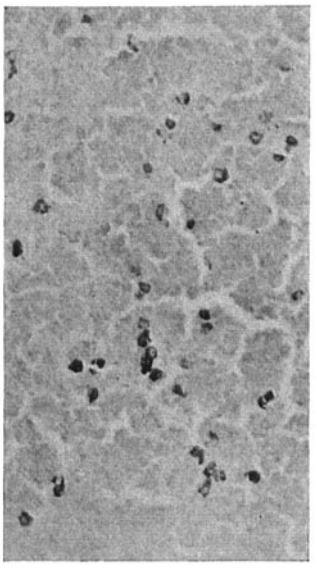

Fig. 2. The frequency of mast cells in the thymus of A/Ph mice. (Toluidine blue, 10 × 16.)

With the exception of thymus parenchyme, tissues of other organs (heart, liver, kidney, lung, skin, intestines and lymph node) of C57BL and A/Ph mice do not markedly differ in their content of mast cells (Figure 2). Whereas their number in the thymus of animals of most strains does not exceed 100/mm³, it ranges between 8650 and 11,500/mm³ in A/Ph, A.CA, NZB and H strain mice.

Mice of the A/Ph strain and the presumably congenic line A.CA thus have a content of mast cells extremely high in spleen and markedly increased in thymus parenchyme. The number of mast cells is known to rise occasionally in lymphoid organs, for example spleen[8] and thymus[9,10] as a reaction to irradiation, in lymph nodes and thymus after hormonal treatment[11] and in spleens after their isotransplantation[6]. These findings might be explained by tissue condensation[9] or transformation of reticulum[8] or lymphoid[12] cells. No obvious reason for the abundance of mast cells in our A/Ph and A.CA mice can be seen so far. The animals are perfectly healthy without any signs of a degenerative disease; their normal condition is also reflected in their capacity to react strongly by antibody formation to i.v. injected antigen (HSA and BGG)[13]. Diet and breeding conditions are identical for all the strains. The possible genetic background of the high content of mast cells in spleen and thymus will be further analysed by testing all available substrains of A mice and their hybrids with negative strains.

Assuming that the mast cells in the positive strains are functionally normal, such strains might turn out to be useful for studying the cytology and function of mast cells and eventually their role in immune processes.

Zusammenfassung. Es wurden in Milz und Thymus von Mäusen des Stammes A/Ph Mastzellenvermehrungen beobachtet und mit den Mastzellenzahlen bei andern Mäusestämmen verglichen.

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