British Society for Developmental Biology

HULL MEETING **4th - 6th APRIL, 1977**

The 35th Meeting of the Society will be held in the University of Hull.

Accommodation will be on campus in **Loten Hall** where **Registration** and the issue of tickets for meals, etc., will be possible from 14.00 hours on Monday, 4th April.

Unlimited car parking is available on the University site; no permits are required for conference visitors.

Further information may be obtained from :

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PROGRAMME

Monday, 4th April

19.30 Workshop on **TRANSPLANTATION TECHNIQUES**

Tuesday, 5th April

Chairman: **M. BALLS (Nottingham)**

09.00 - 09.25 L. N. RUBEN, G. W. WARR and J. J. MARCHALONIS (Melbourne, Australia)
"The molecular basis of antigen recognition by T cells".

09.25 - 09.50 R. D. JURD (Essex)
"Role of thymus during development in lower vertebrates".

09.50 - 10.15 J. D. HORTON and J. J. RIMMER (Durham)
"Development of immunity in amphibians: role of the thymus".

10.15 - 10.40 M. J. MANNING (Hull)
"Residual 'T-cell' responses in thymectomised Xenopus".

10.40 - 11.05 **COFFEE**

Chairman: **W. D. BILLINGTON (Bristol)**

11.05 - 11.30 J. J. T. OWEN (Newcastle-upon-Tyne)
"B lymphocyte differentiation in the embryo".

11.30 - 11.55 J. H. ROBINSON (Newcastle-upon-Tyne)
"Lymphoid development of embryonic mouse thymus in organ culture".

11.55 - 12.20 A. FERGUSON (Edinburgh)
"The appearance of lymphocytes and plasma cells during post-natal development of the small intestinal mucosa in mice".

12.20 - 12.45 C. J. ELSON (Bristol)
"Induction of tolerance in differentiating B lymphocytes".

12.45 - 14.00 **LUNCH**

Chairman: **M. H. JOHNSON (Cambridge)**

14.00 - 14.25	M. ADINOLFI (London) "Ontogeny of human complement and lysozyme".
14.25 - 14.50	M. H. SELLENS (Bristol) "Antigen expression on early differentiating mouse trophoblast *in vitro*".
14.50 - 15.15	B. SLADE and J. MILNE (Aberystwyth) "The ontogeny, localisation and synthesis of chicken alpha-foetoprotein".
15.15 - 15.45	R. D. BARNES (Harrow) "Immunological tolerance in early-embryo-aggregation-derived mouse chimaeras".
15.45 - 16.15	**TEA**
16.15	Extraordinary General Meeting.
19.30 for 20.00	Conference Dinner.

Wednesday, 6th April

Chairman: **R. L. GARDNER (Oxford)**

09.00 - 09.25	F. FARZANEH and C. K. PEARSON (Aberdeen) "The activities and properties of enzymes involved in Poly (ADP-Ribose) metabolism during the development of the South African clawed toad *Xenopus laevis*".
09.25 - 09.50	D. J. WATT and H. M. FURNEAUX (Aberdeen) "A possible relationship between intracellular NAD concentration and the teratogenic action of insulin on the neural folds of the chick embryo".
09.50 - 10.15	M. H. COLLIE, C. SWEET and H. SMITH (Birmingham) "Investigations of possible effects of 'flu' on the fetus, using ferrets as a model system".
10.15 - 10.40	M. ADINOLFI, S. HADDAD and N. GREGSON (London) "Effects of antibrain antibodies on the development of the nervous system".
10.40 - 11.05	**COFFEE**

Chairman: **J. COHEN (Birmingham)**

11.05 - 11.30	H. M. DYER (Aberdeen) "The growth *in vitro* of newborn rat brown and white adipose tissues".
11.30 - 11.55	N. H. K. HOLDER (London) "The control of growth in the developing chick wing".
11.55 - 12.20	G. SHELLSWELL (London) "Autonomy in muscle, tendon and cartilage development".
12.20 - 12.50	J. P. G. WILLIAMS and P. C. R. HUGHES (London) "An examination of the mismatch hypothesis of growth regulation".
12.50 - 14.00	**LUNCH**

Chairman: **M. J. MANNING (Hull)**

14.00 - 14.25	H. A. JOHN (Edinburgh) "Myosin heavy chain mRNA during myogenesis".
14.25 - 14.50	S. SALMONS (Birmingham) "Post-natal differentiation of muscle fibres".
14.50 - 15.15	P. E. WILLIAMS and G. GOLDSPINK (Hull) "Mechanism of longtitudinal growth of striated muscle".
15.15 - 15.40	W. VAN RAAMSDONK, C. W. POOL and G. TEKRONNIE (Amsterdam) "Development of shape and structure of the axial musculature in teleost fishes".
15.40 - 16.05	K. KECZKES (Hull) "Certain developmental abnormalities of the human skin".
16.05	**TEA**

35th MEETING OF THE BRITISH SOCIETY FOR DEVELOPMENTAL BIOLOGY

UNIVERSITY OF HULL
APRIL 4th–6th 1977

ABSTRACTS OF PAPERS

ABSTRACTS OF PAPERS

TUESDAY 5 APRIL

CHAIRMAN : M. Balls (Nottingham)

Title : The molecular basis of antigen recognition by T cells.

Authors : L.N. Ruben, G.W. Warr and J.J. Marchalonis
The Walter & Eliza Hall Institute, Melbourne, Australia.

One of the most controversial aspects of immunology in recent years has been concerned with our understanding of how thymus-derived lymphocytes (T cells) recognize (respond to) antigenic determinants. Our studies with the goldfish, Carassius auratus, suggest the following: (A) An immunoglobulin (Ig) can be demonstrated on the surface of thymocytes by immunofluorescence. (B) This Ig is endogenous to these thymocytes. (C) The Ig can be radioiodinated and isolated by either metabolic release or Triton X-100 treatment. (D) Its heavy chain migrates more rapidly than μ but more slowly than γ in SDS polyacrylamide gels. (E) Ig removed from head nephros immunocytes shows a heavy chain migration pattern suggestive of two peaks, one comparable to μ and one similar to that observed earlier from thymocytes. (F) The capacity of both thymus and head nephros lymphocytes, previously immunized against heterologous erythrocytes, to bind the immunogen can be blocked by prior incubation with rabbit-anti-goldfish IgM of μ and light chain specificity. We have concluded that goldfish thymocytes and thymus-derived lymphocytes recognize antigenic determinants by utilizing membrane Ig. This Ig may differ from Ig present on the antibody producing cell population in the constant region of the heavy chain.

Title : The role of the thymus during development in lower vertebrates.

Author : R.D. Jurd
Essex

Recent studies in amphibians and fishes suggest that the thymus may act as a primary lymphoid organ for lymphocytes involved in both cell-mediated and antibody-mediated immunity. This paper examines some of this work, discussing the effects on the immune response of thymic ablation in larval anamniotes, the characterisation of thymic lymphocytes in larval and adult animals, and the fate of such lymphocytes during ontogenesis. It is suggested that, at least in anamniotes, the concepts of classical immunology with respect to a dichotomous immune response mediated by two distinct lymphocyte populations (including the definition of "T" and "B" cell in such animals) may need qualification or modification.

Title : Development of immunity in amphibians: role of the thymus.

Authors : J.D. Horton and J.J. Rimmer
Durham Aston

Thymic involvement in the ontogeny of cell-mediated and humoral immunity has been examined in sequential thymectomy experiments on Xenopus laevis, the clawed toad.

Thymectomy during the first week of life abrogates induced reactivity to sheep red blood cells (SRBC's) (measured by cell proliferation, rosette and plaque-forming cell production in the spleen, and also by humoral antibody synthesis), but fails to achieve permanent allograft survival, even in the larva.

In contrast to allograft immunity and phytohaemagglutinin reactivity, which are "suppressed" only by thymectomy performed during the first two weeks of life, the development of reactivity to SRBC's requires a prolonged thymic presence, since thymectomy as late as 40 days (just prior to metamorphosis) impairs antibody production. These experiments support a concept of thymus-dependent cell heterogeneity in amphibians.

Title : Residual 'T-cell' responses in thymectomised Xenopus.

Author : M.J. Manning
Hull

In Xenopus laevis we can destroy the thymic buds at a rudimentary stage of lymphoid organ differentiation and, in these experiments, we have identified thymus-dependent and thymus-independent components of the amphibian immune system. We have also detected residual activity in early thymectomized animals which, in classical terms, would be attributed to T-cell functions. For example, thymectomized Xenopus can reject allografts, specifically, although at a much slower rate than normal. The present paper describes and discusses the responses to "T-cell" mitogens of spleen cells taken from thymectomized Xenopus using phytohaemagglutinin and concanavalin A in vitro in 3-day microcultures.

COFFEE

CHAIRMAN : W.D. Billington (Bristol)

Title : B lymphocyte differentiation in the embryo.

Author : J.J.T. Owen
Newcastle upon Tyne

Experiments will be discussed which suggest that foetal liver and adult bone marrow are sites of B lymphocyte differentiation. The results are compatible with the notion that pre-B cells, containing cytoplasmic Ig M but lacking surface Ig ($cIgM^+$ cells), proliferate and convert to B lymphocytes with surface I gM ($sIgM^+$ cells). At the $sIgM^+$ stage, foetal liver and marrow B lymphocytes differ from B cells in other adult lymphoid organs in the ease with which their expression of sIg antigen recognition receptor can be irreversibly suppressed by anti-immunoglobulin sera. These results will be discussed in the context of the differentiation of specificity of lymphocyte responsiveness and the production of tolerance to "self" antigens.

Title : Lymphoid development of embryonic mouse thymus in organ culture.

Author : J.H. Robinson
Newcastle upon Tyne

An investigation of the immunocompetence of small lymphocytes arising from stem cells in organ cultures of embryonic mouse thymus is in progress.

Lymphoid cell yields from cultured thymuses are very much lower than from thymuses of an equivalent age in vivo. However the proportion of cells reactive to polyclonal mitogen or to cells bearing foreign alloantigens is greater in cultured thymus.

We are currently using this culture system to study the mechanism of transplantation tolerance induced during ontogeny. Preliminary data indicates that cells responding to allogeneic cells by proliferation in mixed lymphocyte culture, do not arise in embryonic thymus co-cultured with relevant allogeneic lymphoid tissue.

Title : The appearance of lymphocytes and plasma cells during post-natal development of small intestinal mucosa in mice.

Author : A. Ferguson
Edinburgh

In mice the appearance of lymphocytes and plasma cells within the intestinal mucosa is delayed until the third week of life. Experiments using heterotopically transplanted isografts and allografts of intestine have shown

(1) There is no factor which inhibits lymphoid cell traffic to new born gut (lymphocytes penetrate allografts at three days).

(2) The factor which attracts lymphoid cells in the third week is intrinsic to the small bowel tissue, rather than a property of the lymphoid cells (lymphocytes do not penetrate isografts until the third week of "post-natal age").

(3) The sudden acceleration of epithelial cell turnover at weaning does not occur when there is no antigen within the gut lumen, as in isografts.

It is proposed that local immune reactions may be the factor which alters epithelial cell kinetics around the time of weaning in mice.

Title : Induction of tolerance in differentiating B lymphocytes.

Author : C.J. Elson
Bristol

Although it has long been realized that immune reactions to autologous antigens must be controlled or prevented it is only recently that mechanisms whereby this might occur have come to light. One mechanism

of B cell tolerance which has been proposed, is that at some stage in their differentiation from stem cells to mature antibody forming precursor cells, lymphocytes go through a phase during which contact with antigen induces only tolerance, not immunity. The present experiments were designed to test this hypothesis. It was found that the response of B lymphocytes to a particulate antigen can depend on their stage of differentiation: B lymphocytes differentiating from stem cells were rendered tolerant, while mature B lymphocytes were primed under the same conditions. Lethally irradiated mice of one allotype were repopulated with 13-15 day fetal liver cells from congenic mice bearing another allotype and the effect of antigen on the emergence of responsive B cells determined. B cells, descended from the fetal liver inoculum (identified by their allotype) produced an antibody response to antigen in the presence of additional T cells, 15 days after transfer. Such a response could be prevented by injecting the recipient with alum-precipitated antigen (but not with deaggregated antigen) shortly after irradiation and reconstitution. Mature B cells, on the other hand, were shown to be primed by alum precipitated antigen in irradiated reconstituted hosts. Tolerance in differentiating B lymphocytes is discussed in relation to the acquisition of self-tolerance.

LUNCH

CHAIRMAN : M.H. Johnson (Cambridge)

Title : Ontogeny of human complement and lysozyme.

Author : M. Adinolfi
London

Studies of the onset and site of synthesis of components of human complement (C) have been carried out using in vitro cultures in the presence of labelled aminoacids and the analysis of the culture fluids by autoradiography of the immunoplates.

Most of the components of C start to be synthesized during the first half of fetal life; at 18 weeks of gestation, human fetal sera contained all the proteins of the C system.

C1 is produced in the intestinal mucosa; C3 and C4 in liver and C5 in spleen. Preliminary evidence suggests that C7 and C9 are also produced in fetal liver.

Synthesis of lysozyme begins at about 9 weeks, in the alveolar macrophages and in Paneth cells.

Title : Antigen expression on early differentiating mouse trophoblast *in vitro*.

Author : M.H. Sellens
Bristol

The mixed haemadsorption assay, a sensitive serological test involving the specific adherence of indicator red cells to antibody coated target cells, has been employed to investigate the antigenic status of mouse trophoblast derived from *in vitro* blastocyst and ectoplacental cone outgrowths are restricted to certain mouse strains and are not products of the major histocompatibility complex (H-2). In contrast, H-2 antigens are detectable on trophoblast cell populations cultured from suspensions of mature placenta. These findings will be discussed in relation to the ontogeny of alloantigen expression during trophoblast differentiation and to the role of this tissue in the protection of the foetal allograft.

Title : The ontogeny, localisation and synthesis of chicken alpha-foetoprotein.

Authors : B. Slade and J. Milne
Aberystwyth

Embryonic chicken sera have been studied by immunoelectrophoresis and gradient polyacrylamide gel electrophoresis at different stages of development. Alpha-foetoprotein (AFP) was detectable at the earliest stage examined (5D) and reached a peak at 13D, subsequently declining to undetectable levels at 21D. Using Laurell rocket electrophoresis and purified chicken AFP, it has been possible to quantify serum AFP throughout development.

Alpha-foetoprotein was localised in a range of tissues from chick embryos with fluorescent antibodies. Of these only the yolk sac and liver were actively involved in the synthesis of this protein *in vitro*. Significantly more AFP was produced by the yolk sac than the liver.

These results are discussed in relation to mammalian AFP, and the merits of the chick embryo for studies on the biological function of AFP are considered.

Title : Immunological tolerance in early-embryo-aggregation-derived mouse chimaeras.

Author : R.D. Barnes
Harrow

Early embryo aggregation mouse chimaeras have proven an invaluable tool to study mechanisms involved in tolerance. Such chimaeras are most commonly derived following the aggregation of two undifferentiated embryos and therefore not surprisingly they were originally considered examples of classic immunological tolerance. Since this time alternative mechanisms including humoral and cell suppressor activity have been suggested and until recently tolerance in tetraparental chimaeras has remained a

controversy. This controversy is now reviewed in the light of recent findings which has suggested that such mice are in fact examples of classic tolerance with the possibility that this is achieved by heterogenous elimination of the clones of potentially self↛self auto-reactive cells.

TEA

EXTRAORDINARY GENERAL MEETING

WEDNESDAY 6 APRIL

CHAIRMAN : R.L. Gardner (Oxford)

Title : The activities and properties of enzymes involved in poly (ADP-Ribose) metabolism during the development of the South African clawed toad Xenopus laevis.

Authors : F. Farzaneh and C.K. Pearson
Aberdeen

Eukaryotic cells contain an enzyme called poly (ADP-Ribose) polymerase which catalyses the covalent attachment of the ADP-Ribose moiety of NAD^+ to chromosomal proteins, with the concommitant release of nicotinamide. We have determined the activities and properties of poly (ADP-Ribose) polymerase and glycohydrolase (an enzyme which degrades poly (ADP-Ribose)), during the development of Xenopus laevis. The results will be discussed in relation to current ideas about the biological function of poly (ADP-Ribose).

Title : A possible relationship between intracellular NAD concentration and the teratogenic action of insulin on the neural folds of the chick embryo.

Authors : D.J. Watt and H.M. Furneaux
Aberdeen

A previous communication described the malformations of the neural tube in the chick embryo after administration of certain teratogens including insulin. Increased necrosis in the neural fold was responsible for a failure of the neural tube either to close or to remain closed. Others who have reported alleviation of insulin-induced teratogenic effects by nicotinamide and NAD, suggested that the lesions resulted from an alteration in pyridine nucleotide metabolism. Indeed there is substantial evidence for a relationship between intracellular NAD concentration and growth and differentiation. The nuclear enzyme poly (ADP-Ribose) polymerase, which catalyses an NAD-dependent modification of nuclear protein,

may be the link in this relationship. In order to investigate this hypothesis, we measured the intracellular NAD concentration and the activity of poly (ADP-Ribose) polymerase in neural tubes from control and insulin treated embryos. These results will be discussed and an explanation offered of how insulin acts on the neural folds of the early chick embryo.

Title : Investigations of possible effects of 'flu' on the foetus using ferrets as a model system.

Authors : M.H. Collie, C. Sweet, H. Smith
Birmingham

Using organ-culture, susceptibility comparisons were made between human, ferret and guinea-pig foetal tissues (same susceptibilities) and foetal membranes (differing susceptibilities). Guinea-pig foetuses were infrequently infected in vivo after influenza infection of the mother. The ferret was used as a model for studying consequences of foetal infection. Heavy infection of foetuses was found after infection of prognant ferrets only during late gestation and the eventual effect was an increased resorption rate before birth. This effect was not noticeable after early gestation infection of pregnant ferrets.

Title : Effects of antibrain antibodies on the development of the nervous system.

Authors : M. Adinolfi, S. Haddad and N. Gregson
London

The permeability of the blood-CSF barrier is incomplete during fetal and perinatal life in man and rats. Experimental evidence suggests that maternal antibodies may cross the placenta, reach the fetal circulation and have access to CSF.

Preliminary data shows that antibodies against specific brain antigens, injected into pregnant rats, reach the fetus and may affect the development of certain cells of the central nervous system.

These results will be discussed in relation to mental retardation and other neurological handicaps in man.

COFFEE

CHAIRMAN : J. Cohen (Birmingham)

Title : The growth *in vitro* of newborn rat brown and white adipose tissues.

Author : H.M. Dyer
Aberdeen

Newborn rat brown and white adipose tissues were grown *in vitro*, some in the presence of insulin added to the culture medium. The cultured material was examined by light and electron microscopy and compared with the freshly dissected tissues. After 11 days' growth *in vitro* the cells of both brown and white adipose tissues closely resembled those of freshly dissected white adipose tissue. The presence of insulin in the medium resulted merely in more intra cellular lipid. These findings lend further support to the evidence already existing that brown adipocytes are capable of developing into white adipocytes.

Title : The control of growth in the developing chick wing.

Author : N.H.K. Holder
London

Theories concerning how the growth of the chick limb is controlled are of two main kinds; ongoing feedback controls and predetermined, programmed controls. It is now clear that different parts of the developing chick wing grow differently, for example, the rudiments of the wrist and forearm occupy similar sized regions of the young wing but form obviously disproportionate parts of the adult skeletal structures.

I have used these structures as markers to attempt to distinguish between these two theories of growth control. Counts of cell density and mitotic index have shown growth to be due almost exclusively to cartilage matrix production between stages 26 and 34. Autonomous growth control was shown by explanting pieces of forearm and wrist into organ culture from stage 26 wings. These pieces showed growth very similar to their *in vivo* properties. *In vivo* grafts deleting and adding wrist parts along the proximo distal axis also argue for a predetermined growth control in the wing bud.

Title : Autonomy of cartilage, muscle and tendon development in the chick limb.

Author : G. Shellswell
London

Autonomy of cellular behaviour is an important factor in relation to positional information as a system controlling development. In the extreme case, at the cellular level, once positional value has been specified this would lead to the autonomous expression of a particular cellular activity or molecular differentiation without reference to the behaviour of surrounding cells. Unfortunately it is very difficult to show this in a single cell, but there is evidence for autonomy at the tissue level in the development of the cartilage elements of the

vertebrate limb, both in the proximo-distal and anteroposterior axes. To what extent does the pattern of muscle and tendon in the chick wing show autonomy? Evidence will be presented concerning the formation of muscles in the absence of either tendons of insertion or cartilage element of insertion. Similarly, tendons of insertion can form without their respective muscles. The importance of tendon sheath formation to the way that tendons passing close to each other may or may not fuse is discussed. The division of the limb dorsal and ventral muscle masses will be examined from the viewpoint of activity of non-muscle cells. In conclusion, the extent to which the formation of muscle, tendon and cartilage show autonomy demonstrates its importance in development and the implications for positional information will be discussed.

Title : An examination of the mismatch hypothesis of growth regulation.

Authors : J.P.G. Williams and P.C.R. Hughes
London

The mismatch hypothesis was proposed by Tanner to account for the increased growth rate (catch-up growth) observed after growth retardation. It was proposed that an organism could determine its actual size and could compare this with its "target" size. If growth were inhibited so that the actual size and the target size did not correspond then there would be a 'mismatch' and the subsequent catch-up growth would be proportional to the mismatch.

Growth retardation has been brought about in rats of three different ages and the subsequent catch-up observed in both sexes. The findings for body weight and body length will be presented. These findings indicate that the hypothesis holds for body length but not for body weight suggesting that a single control system for body growth is unlikely.

LUNCH

CHAIRMAN : M.J. Manning (Hull)

Title : Myosin heavy chain mRNA during myogenesis.

Author : H.A. John
Edinburgh

Investigations of myogenesis in tissue culture have shown that multinucleate myotubes are formed by the fusion of mononucleate myogenic cells. Chi et al (1975a,b) recently demonstrated that the myosin in postmitotic mononucleate cells and myotubes differs from that in replicating mononucleate myogenic cells and non-myogenic cells such as fibroblasts, suggesting that different structural genes are involved. Clearly, a procedure that specifically detects the expression of the gene for skeletal muscle myosin is necessary in experiments designed

to illuminate the role of the final mitosis or the cell fusion process in triggering the expression of this gene.

A cDNA copy of purified chick embryonic skeletal myosin heavy chain mRNA (MHC mRNA) distinguished between myogenic and nonmyogenic cells compared by in vitro and in situ hybridization. The majority of cells in replicating mononucleate myogenic cell cultures contained no detectable MHC mRNA. Among the earliest cells to contain MHC mRNA were cells engaged in mitosis. A relatively large amount of MHC mRNA was found in postmitotic mononucleate cells and myotubes and in these cells nucleolar localization of MHC mRNA was observed.

Title : Post-natal differentiation of muscle fibres.

Author : S. Salmons
Birmingham

During a late, frequently post-natal, stage of differentiation mammalian skeletal muscles acquire physiological and biochemical characteristics which appear to suit them to their functional roles in adult life. From this process two main types of muscle emerge. Slow muscles are adapted for constant use; they contract and relax slowly, have a predominantly oxidative metabolism and are fatigue-resistant. Fast muscles are suited to intermittent periods of intense activity; they contract and relax rapidly, have a predominantly glycolytic metabolism, and are easily fatigued. Despite this high degree of specialisation, the muscles of an adult animal can redifferentiate under the appropriate experimental conditions. Thus, if continuous low-frequency impulse activity similar to that normally received by a slow muscle is imposed on a fast muscle, that muscle will ultimately become indistinguishable from a slow muscle in terms of a wide range of physiological, histochemical and biochemical criteria. This and other evidence suggests that differentiation in the immediate post-natal period occurs in adaptive response to the establishment of adult patterns of postural activity.

Title : The mechanisms of longitudinal growth in striated muscle fibres.

Authors : P.E. Williams and G. Goldspink
Hull

During post-natal development skeletal muscle fibres adapt to the increase in bone length by the serial addition of sarcomeres at the ends of existing myofibrils. In very young animals this addition can be prevented by immobilizing the muscles in either the shortened or the lengthened position. In older animals, however, the position in which the muscle is immobilized is important: muscles immobilized in the shortened position show a reduced sarcomere number whereas muscles immobilized in the lengthened position have an increased sarcomere number. It is thought that immobilization alters the functional length of the muscle and that the fibres lose or gain sarcomeres in order to adjust sarcomere length. This suggestion is supported by physiological

studies which have shown that the adjustment of sarcomere number is associated with a shift in the position of the active tension peak so that the muscle develops the maximum tension in the position in which it is immobilized, i.e. the addition or removal of sarcomeres is the means by which sarcomere length can be kept at its optimum. This adaptation to a new functional length takes place even when the muscle is denervated suggesting that the control of muscle fibre length is primarily myogenic rather than neurogenic.

Title : Development of shape and structure of the axial musculature in teleost fishes.

Authors : W. van Raamsdonk, C.W. Pool and G. te Kronnie
Amsterdam

The development of the shape and the structure of the somites of the teleost Brachydanio rerio was studied in embryos under normal conditions and in immobilized embryos. The specific function of the somites, that is to bring about lateral body movements, is required to obtain the optimal somite shape. The difference in longitudinal growth rates between lateral and medial muscle fibres is probably responsible for the development of an oblique muscle fibre pattern. During immobilization this difference in growth rates diminishes.

Red muscle proteins are first only synthetized in the medial part of the somite, about two days later they are only found in a thin superficial layer of muscle fibres. Immobilization interferes with the normal distribution pattern of red and white muscle fibres: during immobilization a mosaic pattern of red and white fibres arises. The distribution of nervous tissue in the somites is probably not affected by immobilization.

It will be concluded that the lateral body movements play at least a modifying role in the distribution of red and white muscle fibres.

Title : Certain developmental abnormalities of the human skin.

Author : K. Keczkes
Hull

The author briefly discusses some clinical patterns due to various congenital abnormalities of blood vessels and lymphatic vessels with particular reference to the following conditions:

a) Blood Vessels

1. Angiokeratoma
2. Angiokeratoma (Mibelli type)
3. Angioma Serpiginosum
4. Hereditary Haemorrhagic Teleangiectases (Osler-Weber-Rendau Syndrome)
5. Haemangiomas
   a) Capillary
   b) Cavernous
   c) Cavernous & Thrombocytopaenia
   d) Generalised
6. Maffucci's Syndrome
7. Klippel-Trenauney Syndrome

b) Lymphatic Vessels

1. Lymphangioma circumscripta
2. Lymphoedema (Milroy's disease)