of various strains of mice. With the exception of the one report of the IA particle in normal BALB/c mouse skeletal muscle tissue[1], investigations to date have not confirmed the presence such a particle in other normal skeletal and extraocular muscles or diseased muscles. PERK et al.[8] described IA particles in myoblasts of murine rabdomyosarcoma transplanted from bat to the BALB/c mouse, and suggested that possibly this type of tumor was not transplantable in the C57BL mouse. Although the appearance of IA particles in the HMD mouse may casually result from the virus infection from other source, the appearance of IA particles in pathological fibers of the two HMD mice emphasizes the need to confirm a possible involvement of the IA particle in the development of muscular dystrophy in the HMD mouse.

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Cilia in Human Fetal Schwann Cells[1]

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Summary. Cilia are present in Schwann cells during myelinogenesis which suggest that these cells could migrate by ciliary movement.

The presence of cilia in Schwann cells has been previously reported in the autonomic nervous system of the adult rat[3], and in cultures of dorsal root ganglia from fetal rats[4]. This report concerns the presence of cilia in Schwann cells during myelinogenesis in the human fetal sciatic nerve. It had been suggested that Schwann cells migrate by amoeboid movement during myelinogenesis[5–7]. However, the present observations suggest that Schwann cells may also migrate by ciliary movement.

Materials and methods. The 7 fetuses studied here ranged from 7–210 mm crown-rump length, or 11–23 weeks estimated fetal age[8]. These specimens were obtained from therapeutic abortions performed for psychiatric reasons. All appeared to be normal for their size and age.

Specimen No.	Crown-rump measurement (mm)	Crown-heel measurement (mm)	Weight (g)	Estimated age (weeks)
DF 156	70	10	36	11
DF 174	100	140	65	13
DF 172	110	150	103	14
DF 150	140	200	148	16
DF 152	150	210	160	17
DF 120	160	250	303	18
DF 122	210	330	357	23

The fetal sciatic nerves were fixed in 2% gluteraldehyde (4 °C) buffered with 0.1 *M* sodium cacodylate for 1 h, washed in the buffer alone for 1 h, fixed in 1% osmic acid buffered with 0.1 veronal acetate for 30 min, and then washed in this buffer for 1 h. Tissue specimens taken at different points of the nerves were dehydrated in graded alcohols, and embedded in Epon 812. The sections were stained with 1% alcoholic uranyl acetate for 5 min, followed by 1% aqueous lead citrate for 10 min, and examined with an RCA EMU 4.

Observations. Cilia, with 9 evenly-spaced triplet tubules, 1 or 2 axial tubules, and centrioles (paired, hollow cylinders whose walls also consist of 9 evenly-spaced triplet tubules (Figures a and b)), were present in the cytoplasm of Schwann cells of myelinated and unmyelinated nerve fibres of the sciatic nerves of 14–23 week fetuses. Centrioles were present, but cilia were not seen in the sciatic nerves of the 11 and 13 week fetuses. Centrioles were more commonly seen than cilia. Only one cilia/cell was the rule. In some Schwann cells (Figures a and b), a centriole was the basal body of the cilium[9]. When the statistics from tissue and grid samplings, and thin sectioning are taken into account, the probability of finding isolated structures, i.e., cilia or centrioles in the cytoplasm of Schwann cells is small.

GRILLO and PALAY[3], reported that the cilia in Schwann cells of the autonomic nervous system of the adult rat consisted of 9 double-fibres, arrayed peripherally in a circle about a cylindrical axial structure. They suggested that this type of cilia could have resulted from arrested development, or could have served a specialized role such as sensory function or motility. BUNGE et al.[4] described as a cilia what appeared to be a 9 triplet tubule arranged concentrically as a cylinder. They showed a large, central vesicle inside the cilia cylinder, similar to that described by GRILLO and PALAY. These findings differed with those reported by GRILLO and PALAY, and BUNGE on the following 2 points: 1. There were 2 axial tubules present in the cilia of the Schwann cells, and 2. cilia were present in Schwann cells associated with myelinated fibres.

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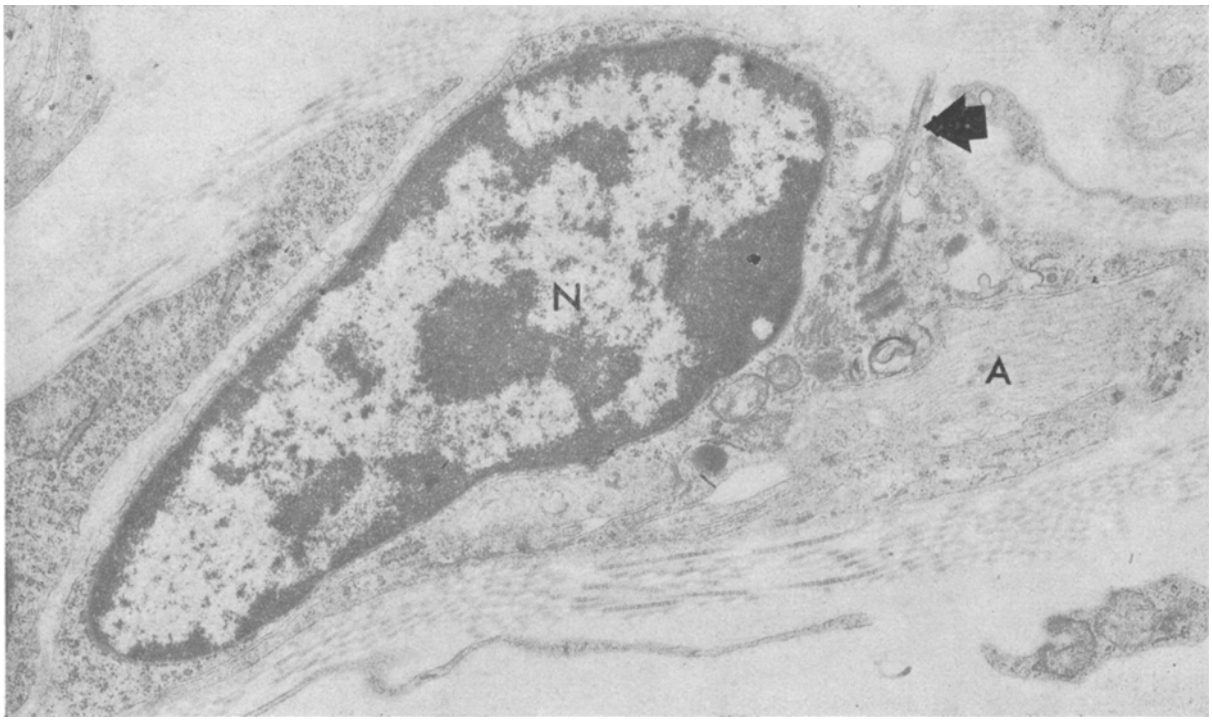
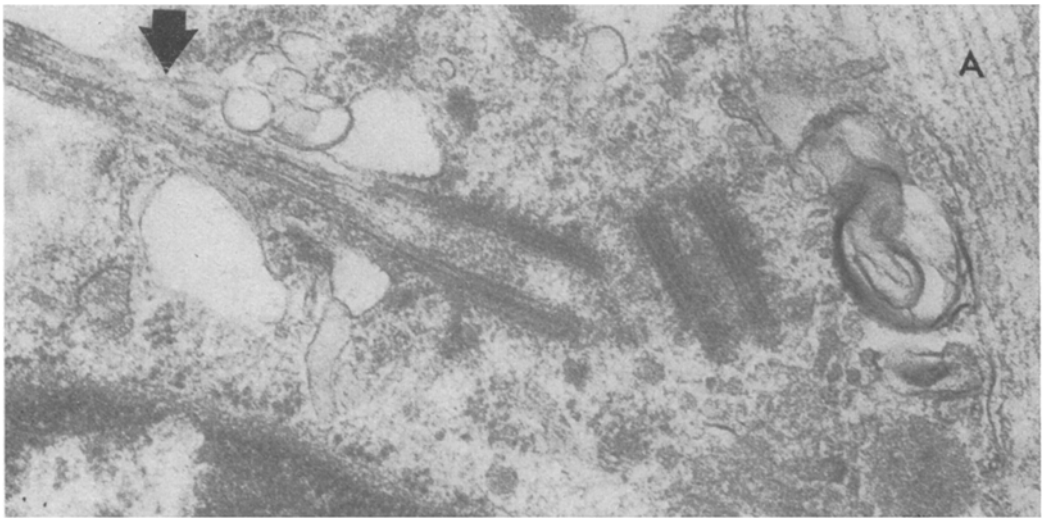


a)



b)

a) A Schwann cell with an axon (A) and a centriole acting as a basal body for a cilia (arrow) in its cytoplasm. × 25,000.
b) A higher magnification (about × 100,000) of the cilia and surrounding structures shown in Figure a.

Cilia, with the 9 + 2 configuration as reported here, are cellular projections distinctly specialized for effecting locomotion[10]. Since Schwann cells migrate during myelinogenesis[5-7], it may be assumed that the cilia play a role in this movement. All available information on migration of the Schwann cells during myelinogenesis (based on observations of tissue cultures[5-7] and recorded on film[11]), indicated that the migration is effected by amoebic movement. However, SPEIDEL[4,5] suggested these as 2 types of amoebic movement; the 'fixed constriction ring' movement, and 'lateral amoebodism'. In the lateral type, SPEIDEL[5] described and illustrated 'delicate pseudopods seen under favorable conditions, stretching out at right angles to the nerve and long axis of the sheath cell'. Could these delicate pseudopods be cilia?

Cilia have been observed in nerve cells in normal and abnormal states. However, the types of cilia vary, e.g., (8 + 1), (8 + 2), (9 + 0), (9 + 1), and their roles are not understood[12-14].

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