Correspondence

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Fetal cells in the blood of pregnant mothers

SIR,

In the August 1980 issue of your Journal,¹ there was a paper dealing with 'fetal lymphocytes' in the maternal blood. Since the paper contains a few mistakes, lacks some important references, and is in contradiction to most existing data, I would like to state the following.

(1) Schröder² has never studied fetal erythrocytes in the maternal blood with immunofluorescent or other techniques (authors' reference 1).

(2) Turunen *et al*³ never studied fetal 'lymphocytes' in maternal blood with a fluorescence activated cell sorter. The group has actually never worked with a cell sorter (authors' reference 26).

(3) The nature of fetal cells in the maternal blood is not known at present. However, all attempts to demonstrate XY mitoses in lymphocyte cultures from pregnant mothers have been unsuccessful,^{4–7} except occasionally after delivery provided the identification has been carried out after quinacrine staining. Since Y chromatin positive cells have been enriched from blood samples of pregnant mothers with HLA antisera and fluorescence activated cell sorting,⁸ it seems reasonable to assume that such cells actually do pass through the placenta during pregnancy. On the other hand, these cells do not seem to divide in lymphocyte cultures and might therefore not be lymphocytes at all.

This was the status of research on fetal cells in maternal blood in August 1980 before the publication of the paper by Kirsch-Volders *et al*. Has the situation radically changed?

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References

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- ³ Turunen O, Lundqvist C, de la Chapelle A. Fetal cells in the maternal blood: differential effects of mitogens on maternal and fetal lymphocytes. *Excerpta Medica Int Cong Ser* No 397, 1976:162–3.
- ⁴ Schröder J, Tiilikainen A, de la Chapelle A. Fetal leukocytes in the maternal circulation after delivery. I Cytological aspects. *Transplantation* 1974;**17**:346–54.

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- ⁷ Schröder J, Herzenberg L. Fetal cells in the maternal circulation. Prenatal diagnosis by cell sorting using a fluorescence-activated cell sorter (FACS). In: *Genetic disorders and the fetus*. New York, London: Plenum Press, 1980.
- ⁸ Herzenberg LA, Bianchi DW, Schröder J, Cann HM, Iverson GM. Fetal cells in the blood of pregnant women: detection and enrichment by fluorescence-activated cell sorting. *Proc Natl Acad Sci USA* 1979;**76**:1453–5.

This letter was shown to Dr Kirsch-Volders, who replies as follows:

SIR,

I wish to thank Dr Schröder for the correction of two references. (1) The second sentence of the first paragraph "Schröder estimated, using immunofluorescent techniques, . . ." should be changed to "Schröder estimated in a review work¹ that from data obtained by immunofluorescent techniques . . .". (2) The congress abstract written by Turunen *et al*² mentioned "the possibility of obtaining enrichment of mitoses of fetal origin". We misinterpreted this sentence as including the use of a fluorescence activated cell sorter. Instead of this reference, Dr Schröder's work³ would have been mentioned, but it had not been published at the time we prepared our paper.

However, I cannot agree with the remark made by Dr Schröder that "all attempts to demonstrate XY mitoses in lymphocyte cultures from pregnant mothers have been unsuccessful". Indeed, as we stated in our paper, many other authors have observed the presence of male fetal cells in the peripheral blood of mothers pregnant with a boy, in interphases and metaphases as well (table).

The fact that Dr Schröder found no male metaphases, except after delivery, in lymphocytes purified from maternal blood on Ficoll—Hypaque gradients and stimulated with PHA or LPS as mitogen and MLC,¹¹ encouraged us to undertake our experiments. We have to confirm that the situation has not radically changed. Some laboratories still find male