

Acknowledgments

I wish to thank Professor C. W. Emmens for the use of animal house facilities, and Ian Pike, Angus Gidley-Baird and Barbara White for their advice on cell cultures and animal husbandry. Dr J. R. Gibbins' assistance with tissue fixation and autoradiography was invaluable. The work was supported by the Fotheringham Fellowship of the Royal College of Obstetricians and Gynaecologists, and the T. B. Walley Fellowship in Obstetrics in the University of Sydney.

References

- Avery, G. B., and Hunt, C. V. (1969). The differentiation of trophoblast giant cells in the mouse studied in kidney capsule grafts. *Transplant. Proc.* **1**, 61–6.
- Beer, A. E., and Billingham, R. E. (1971). Immunobiology of mammalian reproduction. *Adv. Immunol.* **14**, 1–84.
- Brinster, R. L. (1965). Studies on the development of mouse embryos *in vitro*. IV. Interaction of energy sources. *J. Reprod. Fertil.* **10**, 227–40.
- Bulmer, D., and Peel, S. (1974). An autoradiographic study of cellular proliferation in the uterus and placenta of the pregnant rat. *J. Anat.* **117**, 433–41.
- Carter, J. (1976). Expression of maternal and paternal antigens on trophoblast. *Nature (London)* **262**, 292–3.
- Edwards, R. G., Howe, C. W. S., and Johnson, M. H. (Eds) (1975). 'Immunobiology of Trophoblast'. (Cambridge University Press.)
- Eriksen, L., and Eriksen, N. (1972). Availability of label in H3 thymidine for DNA synthesis in cultured macrophages. *Nature (London), New Biol.* **238**, 270–1.
- Fakan, S., and Hancock, R. (1974). Localisation of newly synthesized DNA in a mammalian cell as visualised by high resolution autoradiography. *Exp. Cell. Res.* **83**, 95–102.
- Galassi, L. (1967). Reutilisation of maternal nuclear material by embryonic and trophoblastic cells in the rat for the synthesis of DNA. *J. Histochem. Cytochem.* **15**, 573–9.
- Gardner, R. (1975). Origins and properties of trophoblast. In 'Immunobiology of Trophoblast'. (Eds R. G. Edwards, C. W. S. Howe and M. H. Johnson.) pp. 43–65. (Cambridge University Press.)
- Grieder, A., Odartchenko, N., Cottier, H., Cronkite, E. P., and Schindler, R. (1970). Specificity of tritiated thymidine as a precursor of DNA under conditions of prolonged administration. *Proc. Soc. Exp. Biol. Med.* **134**, 1026–9.
- Hakansson, S., Heyner, S., Sundquist, K., and Bergstrom, S. (1975). The presence of paternal H2 antigens on hybrid mouse blastocysts during experimental delay of implantation and the disappearance of these antigens after onset of implantation. *Int. J. Fertil.* **20**, 137–40.
- Hamilton, W. J. (1970). Some comments on human nidation. In 'Ovo-implantation, Human Gonadotrophins and Prolactin'. (Eds P. O. Hubinont, F. Leroy, C. Robyn and P. S. Leleux.) pp. 149–56. (Karger: Basel.)
- Harris, H., Sidebottom, E., Grace, D. M., and Bramwell, M. E. (1969). The expression of genetic information: a study with hybrid animal cell. *J. Cell. Sci.* **4**, 499–525.
- Horner, D., and McLaren, A. (1974). The effect of low concentrations of H3 thymidine on pre- and post-implantation mouse embryos. *Biol. Reprod.* **11**, 553–7.
- Johnson, M. H. (1975). Antigens on the peri-implantation trophoblast. In 'Immunobiology of Trophoblast'. (Eds R. G. Edwards, C. W. S. Howe and M. H. Johnson.) pp. 87–100. (Cambridge University Press.)
- Kaye, M. D., Jones, W. R., and Anderson, D. T. (1972). Immunology and placentation in viviparous invertebrates. *J. Reprod. Fertil.* **31**, 335–6.
- Krco, C. J., and Goldberg, E. H. (1976). H-Y (male) antigen: detection on eight cell mouse embryos. *Science* **193**, 1134–5.
- Ledoux, L., and Charles, P. (1967). Uptake of exogenous DNA by mouse embryos. *Exp. Cell. Res.* **45**, 498–501.
- Orsini, M. W., and McLaren, A. (1967). Loss of the zona pellucida in mice and the effect of tubal ligation and ovariectomy. *J. Reprod. Fertil.* **13**, 485–99.

- Shackney, S. E., and Ford, S. S. (1974). Correlations between the DNA content distribution and tritiated thymidine studies in relation to population size in sarcoma 180 *in vitro*. *Cancer Res.* **34**, 1401-7.
- Searle, R. F., Sellous, M. H., Elson, J., Jenkinson, E. J., and Billington, W. D. (1976). Detection of alloantigens during preimplantation development and early trophoblast differentiation in the mouse by immunoperoxidase labelling. *J. Exp. Med.* **143**, 348-59.
- Snow, M. H. L. (1973). Abnormal development of preimplantation mouse embryos grown *in vitro* with H3 thymidine. *J. Embryol. Exp. Morphol.* **29**, 601-15.
- Wudl, L., and Chapman, V. (1976). The expression of beta glucuronidase during preimplantation development of mouse embryos. *Dev. Biol.* **48**, 104-9.

Manuscript received 27 June 1977