

Dorothea Bennett 1929–1990

Dorothea Bennett passed away this past August at the age of 60. Dorsey (as she was known to her friends and colleagues) will be remembered both for her pioneering work on the mouse *t*-complex as well as for her outstanding abilities as a teacher. I feel privileged to count myself among her many students. Dorsey began her work in the field of mouse genetics as a graduate student with Salome Waelsch at Columbia University in 1952. Her graduate work represented the first detailed investigation of the phenotypic manifestations of the original mutation discovered at the *Steel* (*Sl*) locus in the mouse (Bennett 1956). It is fitting that this fascinating mouse gene, with pleiotropic effects on melanocyte differentiation, germ cell development, and hematopoietic cell differentiation has just been cloned (Copeland et al. 1990; Flanagan and Leder 1990; Huang et al. 1990; Williams et al. 1990; Zsebo et al. 1990).

By 1956, Dorsey had begun to work on the mouse *t*-complex—which would challenge her for the rest of her life. She began this work within the context of a fruitful collaboration with L.C. Dunn that was to last nearly two decades until Dunn's death in 1974. Her initial work in this system concerned detailed morphological studies of the effects of the various *t*-lethal mutations on embryonic development (Bennett and Dunn 1960; Bennett et al. 1969). However, her work soon branched out to encompass many other facets of biology into which the rich *t*-complex system could offer insight. These included studies of *t*-effects on sperm differentiation and the distortion of male transmission ratios (Bennett and Dunn 1967; Bennett and Dunn 1971; Yanagisawa et al. 1961), the population dynamics of *t*-haplotypes present in wild mice (Bennett 1978; Dunn and Bennett 1971), and the structural differences between *t*-haplotypes and wild-type forms of chromosome 17 (Artzt et al. 1982a; Artzt et al. 1982b; Shin et al. 1983). One experiment that I find particularly elegant was a study of the effect of chimerism on the rescue of embryonic cells destined to die from the maternal inheritance of a deletion over an unusual *T*-locus-associated maternal effect (*Tme*) locus. This work, involving the delicate manipulation and transfer of mouse embryos, was reported in a single author paper, published at a stage in Dorsey's career when most professors do not dare enter their laboratories (Bennett 1978). It is fitting, once again, that the gene responsible for this phenotype has now been cloned as well (Barlow et al. 1991). In another set of elegant chimera experiments, Dorsey and her colleagues demonstrated that *t*-haplotype effects on sperm differentiation and function are limited to the *meiotic partners* of those haploid spermatids that carry the mutant chromosomes (Papaioannou et al. 1979; Seitz and Bennett 1985).

Dorsey's first academic appointment was in 1962 at Cornell University Medical College, where she rose to the rank of professor in 1971. In 1976, she moved across the street to the Sloan-Kettering Institute, and in 1986 she moved to the University of Texas at Austin, where she assumed the responsibilities of Chairman of the Department of Zoology. Dorsey accumulated many awards and honors during her career including lectureships at the Harvey Society of New York, and the College de France in Paris. She was awarded an honorary Doctor of Medicine by the University of Uppsala in Sweden, and was the Alfred W. Roark Centennial Professor at the University of Texas. She was also a member of the Board of Scientific Overseers of The Jackson Laboratory for 14 years, serving as Chairman of that Board during a critical period.

Dorsey will be sorely missed by her many students and colleagues.

References

- Artzt, K., McCormick, P. and Bennett, D.: Gene mapping within the *T/t* complex of the mouse. I. *t*-lethal genes are nonallelic. *Cell* 28: 463–470, 1982a.
- Artzt, K., Shin, K.-S. and Bennett, D.: Gene mapping within the *T/t*-complex of the mouse. II. Anomalous position of the *H-2* complex in *t*-haplotypes. *Cell* 28: 471–476, 1982b.
- Barlow, D.P., Stöger, R., Herrmann, B.G., Saito, K. and Schweifer, N.: The mouse insulin-like growth factor type-2 receptor is imprinted and closely linked to the *Tme* locus. *Nature* 349: 84, 1991.
- Bennett, D.: Developmental analysis of a mutation with pleiotropic effects in the mouse. *J Morph* 98: 199–234, 1956.
- Bennett, D.: Population genetics of *T/t* complex mutations, In H.C. Morse III (ed.); *Origins of Inbred Mice*, Academic Press, New York, 1978.
- Bennett, D.: Rescue of a lethal *T/t* locus genotype by chimerism with normal embryos. *Nature* 272: 539, 1978.
- Bennett, D. and Dunn, L.C.: A lethal mutant (*t^{w18}*) in the house mouse showing partial duplications. *J Exp Zool* 143: 203–219, 1960.
- Bennett, D. and Dunn, L.C.: Studies of effects of *t*-alleles in the house mouse on spermatozoa. I. Male sterility effects. *J Reprod Fert* 13: 421–428, 1967.
- Bennett, D. and Dunn, L.C.: Transmission ratio distorting genes on chromosome 9 and their interactions. *Proc Symp Immunogenetics H-2 System Liblice-Prague*: 90–103, 1971.
- Bennett, D., Dunn, L.C. and Rynerson, M.D.: Genetical and embryological comparisons of semilethal *t*-alleles from wild mouse populations. *Genetics* 61: 411–422, 1969.
- Copeland, N.G., Gilbert, D.J., Cho, B.B., Donovan, P.J., Jenkins, N.A., Cosman, D., Anderson, D., Lyman, S.D. and Williams, D.E.: Mast cell growth factor maps near the *Steel* locus on mouse chromosome 10 and is deleted in a number of *Steel* alleles. *Cell* 63: 175, 1990.
- Dunn, L.C. and Bennett, D.: Lethal alleles near locus *T* in house mouse populations on the Jutland peninsula, Denmark. *Evolution* 25: 451–453, 1971.
- Flanagan, J.G. and Leder, P.: The *kit* ligand: A cell surface molecule altered in *Steel* mutant fibroblasts. *Cell* 63: 185, 1990.
- Huang, E., Nicka, K., Beier, D.R., Chu, T.-Y., Buck, J., Lahm, H.-W., Wellner, D., Leder, P. and Besmer, P.: The hematopoietic growth factor *KL* is encoded at the *Steel* locus and is the ligand of the *c-kit* receptor, the gene product of the *W* locus. *Cell* 63: 225, 1990.
- Papioannou, V.E., Artzt, K., Dooher, G.B. and Bennett, D.: Effects of chimerism for two *T/t* complex mutations on sperm function. *Gamete Res* 2: 147–151, 1979.
- Seitz, A.W. and Bennett, D.: Transmission distortion of *t*-haplotypes is due to interactions between meiotic partners. *Nature* 313: 143–144, 1985.
- Shin, H.-S., Flaherty, L., Artzt, K., Bennett, D. and Ravetch, J.: Inversion in the *H-2* complex of *t*-haplotypes in mice. *Nature* 306: 380–383, 1983.
- Williams, D.E., Eisenman, J., Baird, A., Rauch, C., Van Ness, K., March, C.J., Park, L.S., Martin, U., Mochizuki, D.Y., Boswell, H.S., Burgess, G.G., Cosman, D. and Lyman, S.D.: Identification of a ligand for the *c-kit* protooncogene. *Cell* 63: 167, 1990.
- Yanagisawa, K., Dunn, L.C. and Bennett, D.: On the mechanism of abnormal transmission ratio at the *T* locus in the mouse. *Genetics* 46: 1635–1644, 1961.
- Zsebo, K.M., Williams, D.A., Geissler, E.N., Broudy, V.C., Martin, F.H., Atkins, H.L., Hsu, R.-Y., Birkett, N.C., Okino, K.H., Murdock, D.C., Jacobsen, F.W., Langley, K.E., Smith, K.A., Takeishi, T., Cattanaach, B.M., Galli, S.J. and Suggs, S.V.: Stem cell factor is encoded at the *Steel* locus of the mouse and is the ligand for the *c-kit* tyrosine kinase receptor. *Cell* 63: 213, 1990.