tion signal, again on chromosome 18q12 (Fig. 1b). The cDNA for Dsc3 or Dsc4 did not hybridize with the 320-kb genomic fragment that contains DSG1 and DSG3 (data not shown).

Taken together, these data suggest the existence of a gene cluster for desmosomal cadherins on chromosome 18q12. In addition, our findings provide further insight into the evolutionary relationship among the desmosomal cadherins, as well as information that may aid in linkage analysis of dominantly inherited blistering diseases.

ACKNOWLEDGMENTS

This work was supported in part by a Grant-in-Aid for Scientific Research on Priority Areas from the Ministry of Education, Science, and Culture, Japan, to N. Shimizu and by NIH Grant AR41836 to K. Green.

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Assignment of the Creatine Transporter Gene (SLC6A8) to Human Chromosome Xq28 Telomeric to G6PD

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Received August 12, 1994; revised October 13, 1994

The creatine-phosphocreatine shuttle has important functions in the temporal and spatial maintenance of the energy supply to skeletal and cardiac muscle (2). Muscle cells do not synthesize creatine, but take it up via a specific sodium-dependent transporter—the creatine transporter. Thus, the creatine transporter has an important role in muscular physiology. Furthermore, inhibition of creatine transport in experimental animals causes muscle weakness (10). Recently, creatine transporter cDNAs have been isolated and characterized from rabbit (6) and human (9). In this communication we report mapping of the creatine transporter gene to human chromosome Xq28.

A sequence tagged site (STS) termed CREAT-1 was developed, based on the sequence of the 3’ untranslated region of

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0888-7543/95 $6.00
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the human creatine transporter cDNA (9). Primers for polymerase chain reaction (PCR) of CREAT-1 STS were as follows: 5'-TAGATGGGCGGACCAGATTCT-3' and 5'-CTATATACTCTCGTACTGACG-3'. Reactions were carried out in 50 µl and contained 100 ng of genomic DNA, 0.5 units of Taq DNA polymerase (Perkin-Elmer/Cetus; Norwalk, CT), and primers at final concentration 1 µM. Amplification was with thermal cycler cycling 94°C, 1 min, 60°C, 2 min, and 72°C, 1 min for 40 cycles, and the products were analyzed by agarose gel electrophoresis. A 105-bp PCR product, predicted from the cDNA, was observed in reactions containing human genomic DNA but not in those with mouse or hamster genomic DNA.

The human creatine transporter gene, SLC6A8 (solute carrier class 6, member 8), was mapped to the human X chromosome using somatic cell hybrid panels. A Bios Corporation (New Haven, CT) panel (8) was screened to determine the chromosomal localization of the human SLC6A8 locus and consisted of 1 mouse/human hybrid and 19 hamster/human hybrids, most of which contain only one or two human chromosomes. Two hybrids were positive for CREAT-1, 803 and 909, which contained the human X chromosome. Since all other hybrids were negative for CREAT-1, we conclude that the human creatine transporter gene is located on the human X chromosome.

The position of the human creatine transporter gene on the human X chromosome was confirmed and refined using a second somatic cell hybrid panel of 8 hybrids with the human X chromosome or portions thereof as the only human genomic DNA (5, 11). As shown in Fig. 1, the analysis of this collection of somatic cell hybrid DNAs showed that CREAT-1 is located distal to G6PD. Mapping of the human creatine transporter gene to Xq28 is consistent with mouse genetic mapping, which placed the mouse creatine transporter gene to Xq28. Emery-Dreifuss muscular dystrophy, which also maps to Xq28 (12). Since creatine transporter has a prominent function in the muscular physiology and is abundantly expressed in the skeletal muscle and heart (6, 9), it could be considered a candidate gene for these muscular disorders.

**ACKNOWLEDGMENTS**

This work was supported by PHS Grant HG00734 (M.F.S.). M.G.C. and S.T.W. are investigators with the Howard Hughes Medical Institute.

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