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Serologic Study of Class I&II MHC Antigens in 100 Australian Aborigines from the Northern Territory.

J.HAY*,G.BENNETT,A.SHELDON,D.PUGSLEY, Red Cross Blood Centre and The Queen Elizabeth Hospital, Adelaide, South Australia.

Only 4 antigens were found at the A locus: A2,A24,Aw34 and A11 with antigen frequencies of 0.17,.47,.77 and .23 respectively, with a blank of 0.34. The A11 frequency was four times higher in Northern than in Central tribes.

The B locus contained only 4 antigens in the north: B13, Bw56,Bw60 and Bw61, though 5 cells with B39 were found in the centre; these were confined to one tribe, the Aranda. Antigen frequencies were 0.43,.48,.27,.28 and .50 respectively, with a blank of 0.21. The Bw4 reaction pattern was much shorter than in Europeans.

The C locus revealed only Cw1,3,4,(6) and 7, with antigen frequencies of 0.45,.16,.42,.02 and .13, blank 0.82. Cw1 travelled with Bw56, Cw3 (almost always Cw3.1) with Bw60 and 62, while Cw4 accompanied B13 in all but two instances.

The DR locus lacked DR1,3,7,w9 and w10, and the antigen frequencies of DR2,4,5,w6 and w8 were respectively .22,.27, .16,.39 and .60, with a blank of 0.35. DRw8 travelled with DQw1.

DQw2 was expectedly absent from these people, and DQw1 and 3 had antigen frequencies of 0.98 and .45 respectively, with a blank of 0.56, presumably due in great part to DQw1 homozygosity.

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A Restricted HLA-A Locus in One Hundred Aborigines of Northern and Central Australia.

J.HAY*, G.BENNETT, L.CURIEL, Red Cross Blood Centre, Adelaide, South Australia.

HLA-A2,A3,A24,Aw34,A11 and A31 were the only A locus antigens detected (A23 was excluded by local antisera). One offshore cell carried A31 with no other ethnic indicator, while the A3 antigen was seen in a blatantly European haplotype.

Antigen frequencies were: A2-0.17,A24-0.47,Aw34-0.77 and A11-0.23; blank was 0.34. 74% of A11 was in Northern tribes and 76% of A2 in Central tribes.

A2 was defined by sera 43,53,98,60,50,94,485 and 486. A24 was defined by sera 128,127,73,69,804 and 474 -- 68,494 and 70 gave variable reactions. Aw34 was defined by sera 810,33,36,118,117 and 805, with variable reactions in 812,807, 119,809 and 34. A11 was defined by sera 87,28,25,22,38,808, 809,33, 36,34,35 and 117.

Traditional family studies of these people are unrewarding since the family is not a genetic entity, but haplotypes derived from cells with blanks were: Aw34,Cw1,Bw56,DRw8,DRw52,DQw1 / Aw34,Cw1,Bw56,DR4,DRw53,DQw3 / A24,Cw4,B13,DRw8,DRw52,DQw1 / Aw34,Cw3.1,Bw60,DRw8,DRw52,DQw1 / A11,Cw4,B13,DRw8,DRw52,DQw1.

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Title: Are Northern Australian Aboriginal A10 Antigens actually Aw34?

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Are Northern Australian Aboriginal A10 Antigens Actually Aw34?

J.HAY*,G.BENNETT,R.SUTTON, Red Cross Blood Centre, Adelaide, South Australia.

The Aboriginal "A10 short" is tentatively assigned as Aw34 due to the similarity of the reaction patterns with those of eight Maori cells known to be Aw34 (Fong, Wellington); serum 805 was reactive with Aboriginal but not with Maori Aw34 cells. The four reaction patterns are distinct from those defining Caucasoid A11,A25 and A26. Serum O'Brien (Fong), anti-A11+26+66, one of the original sera defining LN, failed to react with Aboriginal Aw34.

Tribal groups did not show different reaction patterns. Aw34 was defined by sera 810,33,36,118,117,805 and variably by 812,807,119,809 and 34. In the presence of A11 only sera 118/805 and 812 were informative.

Most of these cells were put up with six other Aw34 sera on local trays and some were put up with the six Aw34-containing sera of the Sixth Japanese Red Cross Workshop; patterns of reactivity were seen with each serum group, but the 3AOWH patterns were not reinforced.

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Antigens of the HLA-B Locus in One Hundred Northern Australian Aborigines.

J.HAY*,G.BENNETT,A.SEN, Red Cross Blood Centre, Adelaide, South Australia.

B locus antigens found were B7,B13,B15,B39 and B40; the B39 is probably Aboriginal and the B7 probably not (both antigens are confined to one tribe, the Aranda).

All B15 cells were Bw62 (defined by non-reactivity with local Bw63 sera), and several patterns were seen.

All Bw22 cells were Bw56 and will be discussed separately.

B13 was clearly defined and indistinguishable from the European Australian pattern.

B40 cells were divided evenly between Bw60 and Bw61, while some cells gave intermediate reactions making 60/61 differentiation impossible.

Antigen frequencies were: B13-0.43,Bw56-0.48,Bw60-0.27, Bw61-0.28, B39-0.05 and blank 0.21. Key sera were: B13-154,814,476 and 477; Bw56-818,442,328,330,205 and 320; Bw60-336, 339,338,252,251,346,165,343 and 248; Bw61-380,459,252, 346,165, 341,345 and 248; Bw62-816,817,177,353,275,274,217.

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HLA-Bw56 in a Northern Australian Aboriginal Population.
J.HAY*,G.BENNETT,T.MADIN, Red Cross Blood Centre, Adelaide, South Australia.

Whereas the Melanesian population tested in the 2AOHWC demonstrated Bw55,56 and 54 (Serjeantson), the Aboriginal Australian population shows only Bw56 using the 3AOHWC serum set. Reactivity with sera defining Bw22 or Bw56 was variable, with no demonstrable tribal associations.

Caucasoid Bw56 cells matched one pattern seen in Bw56 Aboriginal cells but not seen in a small number of Maori Bw56 cells (Fong). Four additional reaction patterns were obtained, two of which correspond with Maori patterns and which are possibly equivalent to Bw56C and Bw56A of the 2nd AOHWC. In view of three cells being virtually non-reactive with the 3AOHWC sera although well defined by local typing trays, two very short Bw56 patterns must be considered provisional only.

Reaction patterns:

		3AOHWC sera								
		818	442	328	330	205	320	329	821	326	322
Caucasoid		-	+	+	+	+	+	+/-	-	-	-
Aboriginal	1)	-	+	+	+	+	+	+/-	-	-	-
	2)	+	+	+	+	+	+	+	-	-	-
	3)	+	+	+	+	+	+	+	+	+	-
	4)	-	-	+	+/-	+	+	+	-	-	-
	5)	+/-	+	+	+	+	-	-	-	-	-

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Northern Australian HLA-C Locus Antigens.
J.HAY*,G.BENNETT,M.VARNEY, Red Cross Blood Centre, Adelaide, South Australia.

Cw1,Cw3,Cw4 and Cw7 were well defined by the 3AOHWC sera. Some tentative Cw6 assignments were made, but require confirmation.

Cw1 was almost exclusively associated with Bw56 -- only five Cw1 cells were not Bw56.

Cw3 was invariably the long Cw3.1 pattern, and strongly linked with Bw60.

Cw4 was defined by only one workshop serum, but was confirmed by local sera. Only two Cw4 cells were not B13.

Cw7 was assigned with difficulty, and was found mainly in the Aranda tribe (which carried the B39 and B7 antigens). Aboriginal cells lacking B7 could be a useful cell for Cw7 screening.

Cw1 was defined by sera 417,418 and 421; Cw3 by 426,427, 424,429,431,430 and 425; Cw4 by 829 and Cw7 by 437 and 440.

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DRw6 in the Aborigines of Northern Australia.
A.SHELDON*,J.HAY,M.VARNEY, Red Cross Blood Centre, Adelaide, South Australia.

DRw6 is a common antigen in the this Aboriginal Australian population (antigen frequency 0.39), but its detection is complicated by the presence of both DRw8 and DR5. Typed on local B cell trays, the Aboriginal DRw6 reacts with DRw14 sera but not with some DR5+w8+w13+w14 sera nor with DRw13 sera: It appears to be a further split, different from the Caucasoid patterns of DRw13 and DRw14 seen in this laboratory, and is associated with DRw52 and DQw1. No family data are available.

A number of different reaction patterns were seen with the group of Aborigines that were not DRw8 or DR5 (short or DRw11) positive. The reaction patterns are:

3 AOH sera:	5	5	9	5	6	5	6	5	6	6	6	
	6	6	1	3	2	3	2	7	3	0	7	
	8	9	1	6	6	8	5	4	1	9	8	
Caucasoid DRw13	+	+	+	+	+	+	+	+			+	(Bashir)
Caucasoid DRw14	+	+	+	-	-	-	wk	+			wk	(Bashir)
Aboriginal DRw6	+	+	+	-	-	+	+	+	+	+	+	
	+	+	+	-	-	+	+	+	+	+	-	
	+	+	+	-	-	+	+	+	+	-	+	
	+	+	+	-	-	+	-	+	+	-	+	
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Two DR5 antigens in the Aborigines of Northern Australia
A.SHELDON*,J.HAY,T.MADIN, Red Cross Blood Centre, Adelaide, South Australia.

In a study of 100 Australian Aborigines, two DR5 variants were detected: DRw11 and a short DR5 that did not type as DRw12 on local B cell plates. It has previously been reported that a short DR5 has been detected in the Melanesian population (Serjeantson) and this could well be the antigen seen in the Australian Aborigine.

The identification of the DR5 antigen is complicated by the presence of DRw6 and DRw8, both antigens commonly found in the Aborigines of this study; however, serum 914, which contains no DRw6 or DRw8, reacted positively with DRw11 but not with the DR5 variant. Sera 647,580 and 908 give a similar reaction pattern but were not reacting as reliably as serum 914.

DRw11 and the DR5 variant are in linkage disequilibrium with DQw3+Tal0. Only one DR5 variant is associated with DQw3 (not Tal0).

DR5 and DRw11 are predominantly found in the Aboriginal population of Central Australia (n=12) rather than that of Northern Australia (n=4) but in both areas DR5 and DRw11 appear to be in equal proportions.

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DRw8 in the Aborigines of Northern Australia.

A.SHELDON*,J.HAY,R.SUTTON, Red Cross Blood Centre, Adelaide, South Australia.

In previous reports it has been shown that, in certain populations, DRw8 is in linkage disequilibrium with DQw1(MT1). These populations include the Japanese and Maori (2nd AOHWC), the Melanesian (Serjeantson) and the Australian Aborigine (Termijtelen). A study of 100 Aborigines from Northern and Central Australia has shown that DRw8, the most common detectable antigen in this population, is consistently in linkage equilibrium with DQw1. An analysis of 20 Maori cells (Fong,New Zealand) has shown that the Maori DRw8 gives a similar reaction pattern to the Aboriginal DRw8 and is also in linkage disequilibrium with DQw1.

Typing DRw8 on the 3AOH trays presented no problems:

3 AOH sera:	627	635	628	636	626	631	637	911
Aboriginal DRw8	+	+	+	+	+	+	+	+
Caucasoid DRw8	+	+	+	+	+	+	+	-

Serum 911 appears to be of interest in differentiating between the Aboriginal DRw8 and the Caucasoid DRw8: It is a Caucasoid serum containing antibodies to DR3, DRw13 and DRw14 but is strongly positive with the Aboriginal DRw8 as well.

DRw8 is associated with DRw52 in the Australian Aborigine.

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DQw3 variant in Australian Aborigines.
A.SHELDON*,J.HAY,L.CURIEL, Red Cross Blood Centre, Adelaide, South Australia.

A very short DQw3, associated with DR4, has been found in a study of 100 Aborigines from Northern and Central Australia.

The DQw3+Tal0, the DQw3 (not Tal0) and this short variant have all been detected. The reaction patterns are:

	3AOH sera												
	5	6	5	5	6	6	5	5	5	6	6	5	6
	1	7	2	2	8	8	1	2	1	8	8	2	8
	6	4	2	3	8	7	4	0	7	5	6	1	0
DQw3+Tal0	+	+	+	+	+	+	+	+	+	+	+	+	+/-
DQw3 (not Tal0)	-	-	+	+	+	+	+	+	+	-	-	-	+/-
Short variant	-	-	-	-	-	+	+	-	+	-	-	-	+

The DQw3+Tal0 is associated with 19/20(95%) DR5s, both short and DRw11, and with 8/31(26%) DR4s. The DQw3 (not Tal0) is associated 5/31(16%) DR4s and 1/20(5%) DR5s. The short variant DQw3 is associated with 18/31(58%) DR4s.

Although the sera 687,514 and 517 give extra reactions against various cells, this pattern is consistently present with 58% of the DR4s and cannot be ignored.

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Complement Component C4 Allotypes in Oceania

P.RANFORD[1], J. HAY[2], S.SERJEANTSON[1]*.
[1]Department of Human Biology, John Curtin School of Medical Research, Canberra, Australia and [2]Red Cross Blood Transfusion Service, Adelaide, South Australia.

Complement component C4 allotypes were examined in Australian Aborigines from Darwin and Alice Springs and compared with those from Melanesians, Micronesian and the 3rd AOHWC populations of Japanese, Chinese and White Australians.
Darwin Aborigines were characterized by the highest rate of null alleles yet reported for any population, with gene frequencies of 33.4% for C4A*QO and 26.8% for C4B*QO. By contrast, the C4A*QO frequency in Micronesians, Melanesians and Alice Springs Aborigines is 10% and the C4B*O frequency in Melanesians only 1%. Since C4 null alleles are reportedly associated with an increased risk for systemic lupus erythematosus (SLE) our finding may explain a previous report of an increased prevalence and severity of SLE in Australian Aborigines.
In all the populations studied the same C4A, C4B linkage disequilibrium relationships persisted, with C4A*3.B*1 and C4A*4.B*2 the most common haplotypes. Since divergence of the races occurred at least 50,000 years ago, the maintenance of this linkage disequilibrium indicates a "cold spot" of recombination in this region of the genome.