	DYS 393	DYS 390	DYS 19	DYS 391	DYS 385a	DYS 385b	DYS 426	DYS 388	DYS 439	DYS 389-1	DYS 392	DYS 389-2	DYS 458	DYS 459a	DYS 459b	DYS 455	DYS 454	DYS 447	DYS 437	DYS 448	DYS 449	DYS 464a	DYS 464b	DYS 464c	DYS 464d	DYS 460	GATA-H4	YCA-IIa	YCA-IIb	DYS 456	DYS 607	DYS 576	DYS 570	CDYa	CDYb	DYS 442	DYS 438
R1b	13	24	14	11	11	14	12	12	12	13	13	29	17	9	10	11	11	25	15	19	29	15	15	17	17	11	11	19	23	15	15	18	17	37	38	12	12
Group 4a	13	24	15	11	11	15	12	12	12	12	13	28	18	9	10	11	11	25	15	19	29	15	15	17	17	11	12	19	23	14	14	18	17	36	38	12	12
M222+	13	25	14	11	11	13	12	12	12	13	14	29	17	9	10	11	11	25	15	18	30	15	16	16	17	11	11	19	23	17	16	18	17	38	39	12	12
Ewing*	13	25	15	11	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	18	16	18	17	37	38	11	12
Group 2	13	25	15	10	11	13	12	12	13	13	14	29	17	9	10	11	11	25	15	18	31	15	16	16	17	11	11	19	23	18	16	18	17	37	38	11	12

*Reference row for mutation colorization is the Ewing modal haplotype

Discussion

Superficially, this diagram looks like a genealogic descendancy chart, but it is important to remember that this is not what it is. Rather, it is a way to display the results of genetic testing that highlights differences between project participants and makes hypotheses about how these might have come to be. The haplotype of each participant on the chart is completely characterized on the chart: to arrive at the haplotype of a participant, start with the Ewing modal haplotype, and then change marker values to match those you come to as you trace the line to the participant of interest.

We have put lines leading to participants in our various Groups close together, but the horizontal position of a branch on the chart has no significance, and could be moved around on the chart without changing its meaning.

There are many alternative ways a chart like this could be configured that do have significance. We could put any of these individuals on any branch of the chart by using a suitable combination of parallel mutations and back mutations.

In the chart, mutations are shown to the right of the line they occurred on.
Back Mutations are shown in red.
Parallel Mutations are shown in blue.
"Unique" Mutations are shown in black.

Note: Below the Ewing modal haplotype (so not including Group 3) there are 76 mutations shown in this chart, of which 15 are back mutations (8 of them at CDY), 39 are parallel mutations (10 of them at CDY) and only 22 are unique mutations.