SEQLinco: A Novel Approach to Use Sequence Data for Linkage Analysis

Gao T. Wang1, Di Zhang1, Biao Li1, Hang Dai1, Suzanne M. Leal1, \*

1Center for Statistical Genetics, Department of Molecular and Human Genetics, Baylor College of Medicine, Houston, TX 77030, USA

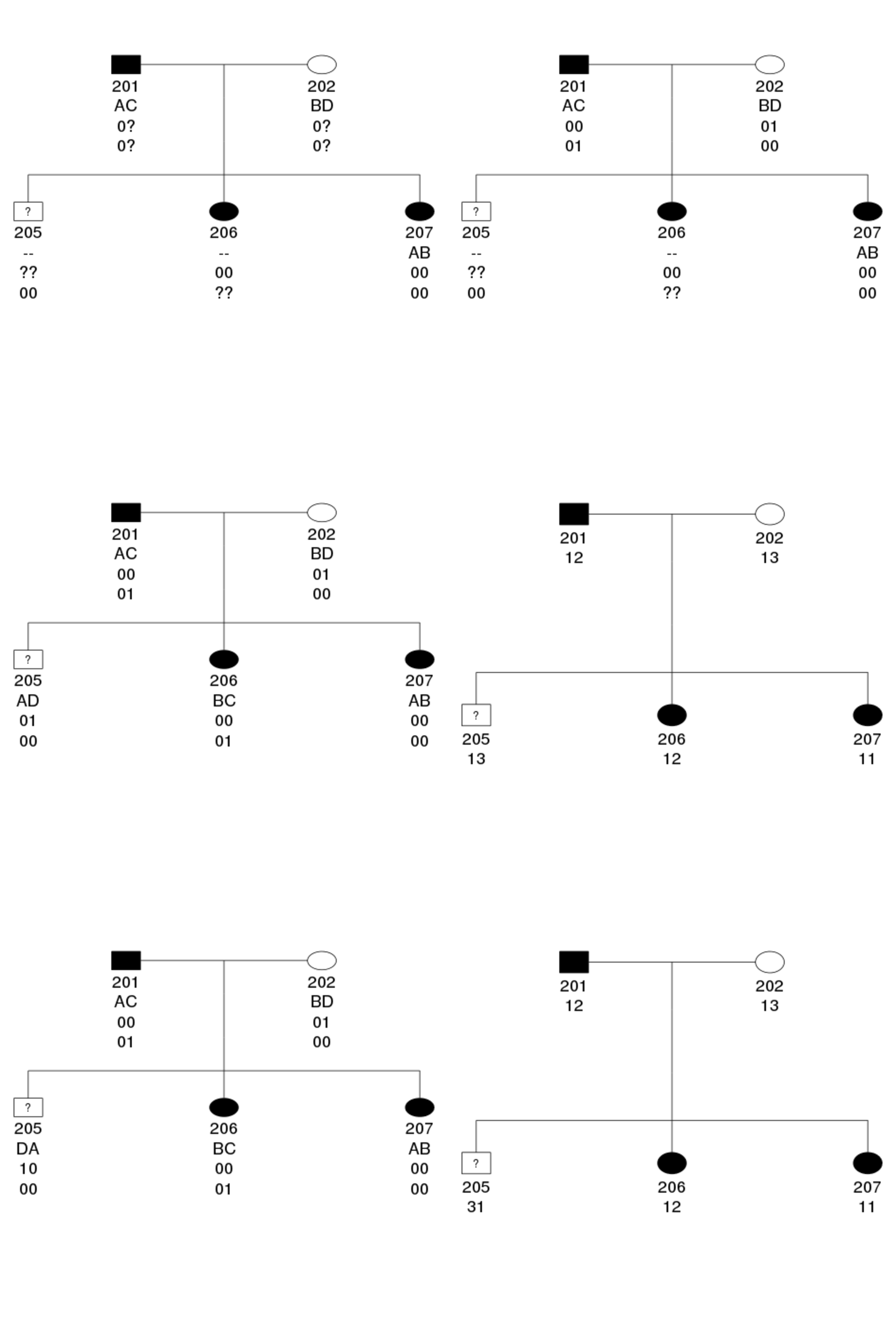
**Methods**

We propose a *Combined Haplotype Pattern* (CHP)method to

***Haplotype reconstruction***

1. *Resolve some parental sites based on 00&11 sites in offspring*: For sites where any offspring is 00, configuration of that site on both parents are fixed as 0x indicating the inheritance of the 0 allele. We place alleles thus determined on the left side. The same procedure applies for 11 sites in offspring.
   1. Figure 1.1: From #207 alone we can determine the left side of all sites in #201 and #202. Also we consider site 2 in #205 and site 1 in #206 resolved as they were originally 00 sites.
   2. Figure 1.2: The right side of all sites in #201, #202 are naturally resolved given knowledge of parental genotype.
2. *Determine more sites on offspring based on parents*: For sites where parental haplotypes are all available due to previous step, we determine offspring haplotypes on those sites based on parental haplotypes and offspring genotypes.
   1. Figure 1.3 and 1.4: We now work on site 1 in #205 and site 2 in #206. Given according to the data they are both heterozygous, for each of #205 and #206 we arbitrarily pick up a configuration that does not result in Mendelian conflict (in fact for this example any arbitrary choice of configuration will not result in Mendelian conflict). We then apply CHP*.*
   2. Figure 1.5 and 1.6: What if we use a different arbitrarily picked configuration for an offspring? For example for site 1 in #205 we use another configuration. The resulting CHP result is not effected.

All sites in example on Figure 1 have 00 genotypes in at least one offspring, so the problem is solved within this single step.



***Recombination events***

***Missing data***

**Figure legends**

**Figure 1.**

**Appendix**