

Problem Set on Inheritance-key for #6 and 7

6) Chands syndrome is an autosomal recessive condition characterized by very curly hair, underdeveloped nails, and abnormally shaped eyelids. In the pedigree at right, which individuals must be carriers?

The following individuals MUST be carriers: I-3, I-4, II-4, III-3, III-4. Also, either I-1 OR I-2 must be a carrier

7) Achondroplasia is a common form of hereditary dwarfism that causes very short limbs, stubby hands, and an enlarged forehead. Below are four pedigrees depicting families with this specific type of dwarfism: What is the most likely mode of inheritance? Cite a reason fro your answer.

The first striking feature is that Achondroplasia does not appear to ever skip a generation; if an individual shows the traits, then one of his/her parents did as well. This indicates dominant inheritance of Achondroplasia. Furthermore, the fact that it appears in both genders according to simple Mendelian inheritance indicates that the gene in question is located on an autosome rather than on a sex chromosome. We can characterize the inheritance pattern as “Autosomal Inheritance” Note that in theory autosomal recessiveness could be possible, however in order to make this work, you can see that every non-affected individual *has* to be a carrier, Except for: pedigree 2: II-2 and III-1; pedigree 3: II-3 and III-1; pedigree 4: III-2 and IV-1.