

A Paternity Case

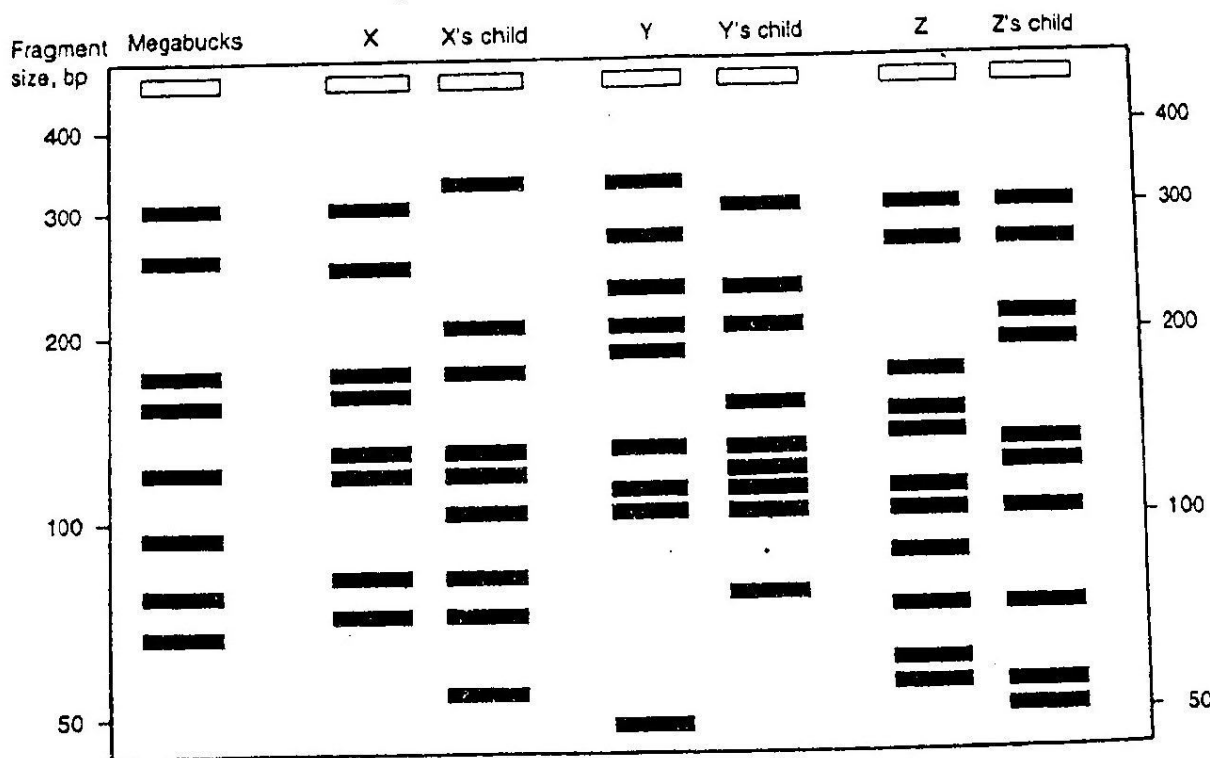
Mr. I. M. Megabucks, the wealthiest man in the world, recently died. Since his death, three women have come forward. Each woman claims to have a child by Megabucks and demands a substantial share of his estate for her child. Lawyers for the estate have insisted on DNA typing of each of the alleged heirs. Fortunately, Megabucks anticipated trouble like this before he died, and he arranged to have a sample of his blood frozen for DNA typing.

Laboratory technicians used the Southern hybridization method to look at three highly variable chromo-

some regions. The results of the blots are shown in Fig. 26.1. Your job is to analyze the data and determine whether any of the children could be Megabucks' heir.

Remember that every person has two of each chromosome, one inherited from his mother and one inherited from his father. Half of every person's DNA comes from his mother, and half comes from his father, so some of the DNA bands showing in the Southern blots of the children will come from their moth-

Figure 26.1 Results of hybridization analysis.



ers, and the rest will come from their fathers. The question is, could that father be Megabucks?

1. For the first child, identify the bands in the DNA profile that came from the mother. (Remember that not all of the mother's DNA is transmitted to the child; just one of each pair of chromosomes is transmitted.) Mark the bands that came from the mother with an M. Circle the remaining bands.
2. Compare the remaining bands with the DNA profile from Megabucks. If he is the father, then all of

the circled bands in the child's profile should have a corresponding band in his profile. Use a straightedge to help you line up the bands accurately. (Remember that only half of the father's chromosomes are transmitted to a child, so not every band from the father would match the child's profile.)

3. Repeat the analysis for the other alleged heirs. Could any of them be Megabucks' children?