

1. shows a restriction map of a piece of DNA containing your favorite gene. The arrow indicates the position and orientation of the gene in the DNA. In part B of the figure are enlargements showing the portions of the DNA whose sequences have been used to make oligonucleotide probes A, B, C, and D. Which of the oligonucleotides can be used to detect the gene in each of the following?

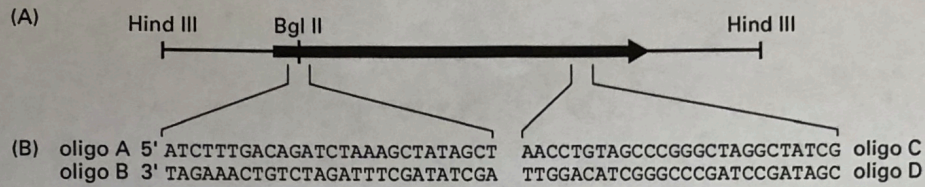


Figure 1

- A. A Southern blot of genomic DNA cut with Hind III.
 B. A Northern blot.
2. Which of the following is a limitation on the use of PCR to detect and isolate genes?
- The sequence at the beginning and end of the DNA to be amplified must be known.
 - It also produces large numbers of copies of sequences beyond the 5' or 3' end of the desired sequence.
 - It cannot be used to amplify a particular sequence from a mixture of mRNAs.
 - It cannot be used to amplify cDNAs.
 - It will amplify only sequences present in multiple copies in the DNA sample.
3. You have been hired to create a cat that will not cause allergic reactions in cat-lovers. Your co-workers have cloned the gene encoding a protein found in cat saliva, expressed the protein in bacteria, and shown that it causes violent allergic reactions in people. But you soon realize that even if you succeed in making a knockout cat lacking this gene, anyone who buys one will easily be able to make more hypoallergenic cats just by breeding them. Which of the following will ensure that people will always have to buy their hypoallergenic cats from you?
- Injecting the modified ES cells into embryos that have a genetic defect that will prevent the mature adult from reproducing.
 - Implanting the injected embryos into a female cat that is sterile due to a genetic defect.
 - Selling only the offspring from the first litter of the female cat implanted with the injected embryos.
 - Surgically removing the sexual organs of all the knockouts before you sell them.