Roll number: 9024 BG final exam SAQ

1. We use SNP as the marker to find a specific place for the gene. For example, in this experiment we first cross two worms with CB4856 and mutation gene respectively and we will get a worm with both CB4856 and mutation gene. Since SNP1 at the CB4856 is a specific cutter, we can cut the gene and run the gel to get the position of the marker SNP1. With the marker SNP1, we can do the positional cloning to clone the genomic DNA within candidate region. Through DNA walking process, we can finally map the mutation gene.
2. Odds rate (e2) = (3.9%/8.4%)/(96.1%/91.6%)=0.44

Odds rate (e4) = (36.7%/13.7%)/(63.3%/86.3%)=3.58

The result may show that E4 can increase the risk of the disease. we know that ApoE enhances proteolytic break-down of β-amyloid aggregates. It is likely that E4 is not as effective as the others at promoting this reaction.

1. Advantages:
2. High throughput
3. Whole-genome coverage
4. High sensitivity

When: we can use this technique during pregnant screening for the non-invasive prenatal testing of DNA fragments circulating in the mother’s blood. This can help us find some new gene association for the genetic disorders.

1. To test whether the one gene is related to the pattern formation, we can do a knock-out experiment.

Firstly, we can use the pronuclear microjection to construct several transgenetic mice with specific the mutation we wanted. The genetic tools for gene editing can be CRISPR/CAS 9 that is transported through virus. Then, we observe the embryonic development for several weeks. If the situs inversus did exist, we can do the genotyping and western blot to learn whether the downstream protein of mutant gene is activated. Finally, based on the research, we can conclude whether the mutant gene is related to the phenotype.

1. (1) Reduce exogenous estrogen exposure

(2) prophylactic mastectomy

(3) healthy lifestyle

(4) in time screening, do physical examination regularly