A. Competitive Approach

Example A:

	Significant	Not Significant	
SNP in gene set *G*	20	80	100
SNP outside gene set *G*	100	400	500
	120	480	600 SNPs

- 20% of SNPs within *G* significant
- 20% of SNPs outside of *G* significant
- P = 0.55 for Fisher's exact test of the competitive hypothesis
- No evidence of enrichment

Example B:

	Significant	Not Significant	
SNP in gene set *G*	40	60	100
SNP outside gene set *G*	100	400	500
	140	460	600 SNPs

- 40% of SNPs within *G* significant
- 20% of SNPs outside *G* significant
- P < 0.001 for Fisher's exact test of the competitive hypothesis
- Evidence of enrichment

**Note that the statistical test applied here assumes independence of p-values, which is an invalid assumption in the presence of LD. Here this simple test is only used to illustrate the competitive hypothesis.*

B. Self-contained Approach

Number of SNPs in gene set *G* significant with p < 0.05		
	Significant	Not Significant
Observed	20	80
Expected	5	95

- 20% of SNPs within *G* significant.
- Under the null hypothesis, expect 5% of the SNPs to be significant.
- P = 0.002 for Fisher's exact test of the self-contained hypothesis.
- Evidence of association of the gene set with the trait.

**Note that the statistical test applied here assumes independence of p-values, which is an invalid assumption in the presence of LD. Here this simple test is only used to illustrate the self-contained hypothesis.*