Genetic Code:

	T	C	A	G
T	TTT Phe (F)	TCT Ser (S)	TAT Tyr (Y)	TGT Cys (C)
	TTC "	TCC "	TAC	TGC
	TTA Leu (L)	TCA "	TAA Ter	TGA Ter
	TTG "	TCG "	TAG Ter	TGG Trp (W)
C	CTT Leu (L)	CCT Pro (P)	CAT His (H)	CGT Arg (R)
	CTC "	CCC "	CAC "	CGC "
	CTA "	CCA "	CAA Gln (Q)	CGA "
	CTG "	CCG "	CAG "	CGG "
A	ATT Ile (I)	ACT Thr (T)	AAT Asn (N)	AGT Ser (S)
	ATC "	ACC "	AAC "	AGC "
	ATA "	ACA "	AAA Lys (K)	AGA Arg (R)
	ATG Met (M)	ACG "	AAG "	AGG "
G	GTT Val (V)	GCT Ala (A)	GAT Asp (D)	GGT Gly (G)
	GTC "	GCC "	GAC "	GGC "
	GTA "	GCA "	GAA Glu (E)	GGA "
	GTG "	GCG "	GAG "	GGG "

8. Plan PCR oligonucleotides to clone the S. cerevisiae coding sequence for triose phosphate isomerase into the BamHI site of of pET-11c. Your goal is to have the sequence expressed as a fusion with the phi10 leader. For your reference, here is the sequence containing the Xba1 site (TCTAGA), the ATG start codon for the phi10 leader, the BamHI site (GGATCC) and ending with the EcoRV site (GATATC). This corresponds with the map distributed separately (see asterisk).

TCTAGAAATA ATTTTGTTTA ACTTTAAGAA GGAGATATAC ATATGGCTAG CATGACTGGT
GGACAGCAAA TGGGTCGGAT CCGGCTGCTA ACAAAGCCCG AAAGGAAGCT GAGTTGGCTG
CTGCCACCGC TGAGCAATAA CTAGCATAAC CCCTTGGGGC CTCTAAACGG GTCTTGAGGG
GTTTTTTGCT GAAAGGAGGA ACTATATCCG GATATC

9. Plan two degenerate PCR oligonucleotides which, when combined with the two oligos from problem 8, generate the triose phosphate isomerase sequence with the following mutations possible: N14T, N14D, and N14A. (see table 8.3, p. 186 in Glick & Pasternack).

10. A different way: Assuming that you have a cloned plasmid from problem 8, plan two oligonucleotides to generate the mutations in problem 9 through an "inside out" approach.