

**PROTEIN SYNTHESIS PRACTICE 3**

Interpreting diagrams is an important skill in learning science. The following diagram illustrates some aspects of protein synthesis — the making of a protein from a gene. Use the Universal Genetic Code Chart to answer the questions on the next page. Some DNA, RNA, and amino acid information from the analysis of a gene present in five different species is shown in the chart on the next page.

**Universal Genetic Code Chart****Messenger RNA Codons and Amino Acids for Which They Code**

		Second base				
		U	C	A	G	
First base	U	UUU } PHE UUC } UUA } LEU UUG }	UCU } UCC } SER UCA } UCG }	UAU } TYR UAC } UAA } STOP UAG }	UGU } CYS UGC } UGA } STOP UGG } TRP	U C A G
	C	CUU } LEU CUC } CUA } CUG }	CCU } CCC } PRO CCA } CCG }	CAU } HIS CAC } CAA } GLN CAG }	CGU } ARG CGC } CGA } CGG }	U C A G
	A	AUU } ILE AUC } AUA } AUG } MET or START	ACU } ACC } THR ACA } ACG }	AAU } ASN AAC } AAA } LYS AAG }	AGU } SER AGC } AGA } ARG AGG }	U C A G
	G	GUU } VAL GUC } GUA } GUG }	GCU } GCC } ALA GCA } GCG }	GAU } ASP GAC } GAA } GLU GAG }	GGU } GGC } GLY GGA } GGG }	U C A G

- Using the Universal Genetic Code Chart, fill in the missing amino acids in the amino acid sequence for **species A** in the chart on the next page.
- Using the information given, fill in the missing mRNA bases in the mRNA strand for **species B** in the chart on the next page.

3. Using the information given, fill in the missing DNA bases in the DNA strand for **species C** in the chart below.

Species A	DNA strand:	TAC	CGA	CCT	TCA
	mRNA strand:	AUG	GCU	GGA	AGU
	Amino acid sequence:	_____	_____	_____	_____
Species B	DNA strand:	TAC	TTT	GCA	GGA
	mRNA strand:	_____	_____	_____	_____
	Amino acid sequence:	MET	LYS	ARG	PRO
Species C	DNA strand:	_____	_____	_____	_____
	mRNA strand:	AUG	UUU	UGU	CCC
	Amino acid sequence:	MET	PHE	CYS	PRO
Species D	DNA strand:	TAC	GTA	GTT	GCA
	mRNA strand:	AUG	CAU	CAA	CGU
	Amino acid sequence:	MET	HIS	GLN	ARG
Species E	DNA strand:	TAC	TTC	GCG	GGT
	mRNA strand:	AUG	AAG	CGC	CCA
	Amino acid sequence	MET	LYS	ARG	PRO

4. According to these amino acid sequences, which *two* plant species are the most closely related? Remember the more similar the amino acid sequence, the more related the species. Support your answer.

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