

Table 8.1 Principal Classes of Sensory Proteins in *Escherichia coli* K12

Sensor type	No.	Function	Signaling mechanism
Histidine kinase	30	Transcriptional regulation, control of other processes	Phosphorylation of the REC domain of various response regulators
Methyl-accepting chemotaxis protein	5	Chemotaxis	Interaction with histidine kinase CheA, chemotaxis response regulator CheY
Ser/Thr protein kinase	1 + 1 ^a	Transcriptional regulation, posttranslational regulation	Phosphorylation of Ser or Thr residues in target proteins
Ser/Thr protein phosphatase	2	Same as above	Dephosphorylation of Ser/Thr protein kinases or other target proteins
PTS membrane component	23	Sugar transport, chemotactic signaling, regulation of adenylate cyclase activity	Direct effect on chemotaxis, most likely through direct interaction of PTS enzyme I with the histidine kinase CheA
Adenylate cyclase	1	Global regulation of transcription	Synthesis of cAMP
Diguanylate cyclase	12+7 ^b	Regulation of protein and polysaccharide secretion	Synthesis of c-di-GMP
c-di-GMP-specific phosphodiesterase	10+7 ^b	Same as above	Hydrolysis of c-di-GMP

^a While YegI is believed to function as a Ser/Thr kinase, it remains unclear whether UbiB is an enzyme of ubiquinone biosynthesis or a Ser/Thr kinase that regulates this pathway (see the text for details).

^b Seven *E. coli* K12 proteins contain both GGDEF and EAL domains and could potentially catalyze both synthesis and hydrolysis of c-di-GMP (see the text for details).