PDR5 encodes a multidrug transporter that is involved in the pleiotropic drug response. Pdr5p efflux pump activity is NTP-dependentand mediates resistance to many xenobiotic compounds including mutagens, fungicides, steroids, and anticancer drugs. In addition to drug response, Pdr5p is also involved in cation resistance, lipid translocation, and in quorum sensing for yeast populations growing in liquid culture. Null mutations of pdr5 are not lethal but do confer a drug- and salt-hypersensitive phenotype. Pdr5p, a proposed homodimer, functions at the plasma membrane and has a half life of 45-90 minutes. Pdr5p is monoubiquitnated, which serves as a signal for endocytosis and eventual degradation in the vacuole. Countering ubiquitination, Pdr5p phosphorylation by serine/threonine kinasestabilizes the protein. Pdr5p levels are highest during exponential growth and are greatly reduced when cells enter diauxic growth or when nutrients are depleted. PDR5 expression is positively regulated by Pdr1p and Pdr3pand negatively regulated by Rdr1pthrough the binding of these transcription factors to pleiotropic drug response elementspresent in the PDR5 promoter. PDR5 expression is also heat-shock-induced by the AP-1 transcription factors Yap1p and Cad1p. Pdr5p is a member of the ATP-binding cassettefamily of proteins, a large group that are conserved from bacteria to humans. Overexpression of the human ABC transporter ABCB1/MDR1is a factor in tumor resistance to drug therapy, and deficient ABC transporter function has been implicated in other human diseases as well. S. cerevisiae ABC proteins are often used as a model to study the clinical problem of drug resistance in infectious disease and cancer as well as in pharmaceutical screens for novel drugs.