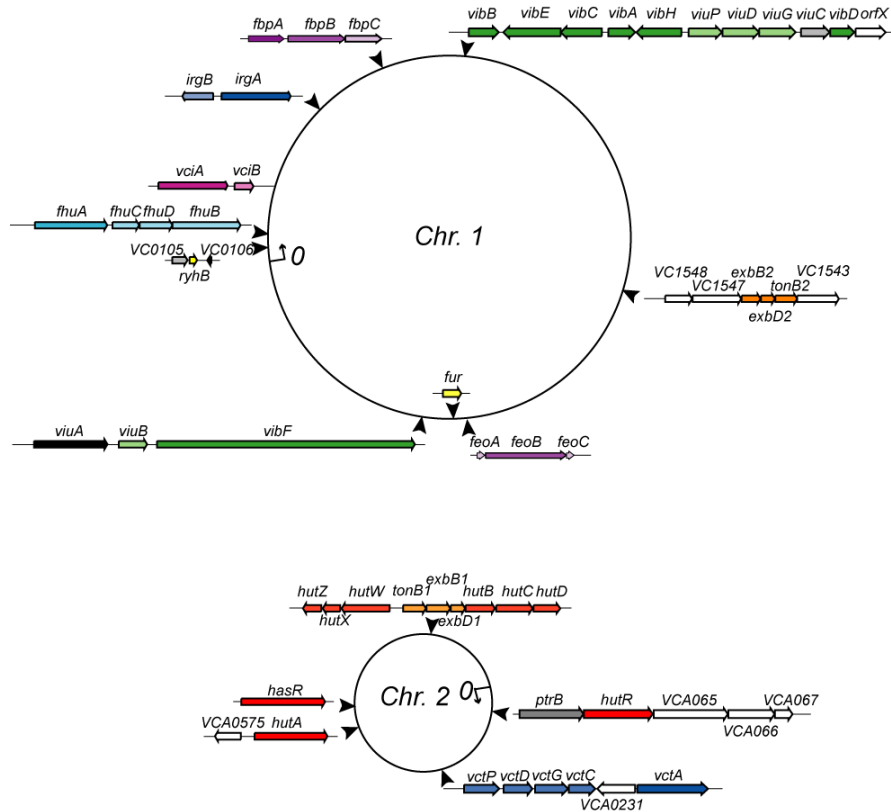


# *Vibrio cholerae* iron transport: adaptation to life in multiple environments

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*Vibrio cholerae* has multiple iron transport systems. These include synthesis and transport of the catechol siderophore vibriobactin (Vib and Viu proteins), transport systems for xenosiderophores (Fhu, Irg, Vct), heme transporters (Hut, Has) and transport systems for free ferric or ferrous iron (Fbp, Feo). To test the roles of each transport system, *V. cholerae* strains were constructed that have a single iron transport system. These strains were compared for growth in different environmental conditions. Strains having only the Feo ferrous iron transporter grew in acidic or anoxic conditions. Growth of this strain in the presence of oxygen was promoted by the presence of VciB, a cytoplasmic membrane protein. In contrast, the Fbp ferric iron transporter supported growth of *V. cholerae* in alkaline medium under aerobic conditions. These data suggest that the multiple iron transporters are not redundant systems but allow *V. cholerae* to acquire sufficient iron for optimal growth from a variety of sources and in a number of different environments.



*Vibrio cholerae* iron transport genes