

PLASMID TRANSFER BETWEEN THE BACTERIAL AND EUKARYOTIC CELLS

S u m m a r y

Horizontal gene transfer (HGT) is characterized by a stable transfer of genetic information from one organism to another. This kind of genetic exchange occurs mainly between prokaryotic organisms (bacterial conjugation), whereas cases of HGT between prokaryotic and eukaryotic organisms are extremely rare. Some reports describe gene transfer between *Escherichia coli* and *Saccharomyces cerevisiae* cells that resembles bacterial conjugation. However, the only example of gene transfer between prokaryotic cells and the cells of higher eukaryotes is the case of T-DNA transfer from *Agrobacterium* to plant cells. The ability of *Agrobacterium* to transfer a fragment of its DNA to plant cell provides a powerful tool for plant biotechnology, and therefore the *Agrobacterium*-mediated DNA transfer is one of the most commonly used tech-

niques of plant transformation. In early days this method was restricted only to the dicotyledonous plants, since it was believed that *Agrobacterium* could infect dicots solely. This was due to the use of tumor formation tests as indication of bacterial infection. Later, it was found out that although *Agrobacterium* indeed induced tumors only on dicotyledonous plants, it was able to infect monocotyledonous plants as well, but without tumor formation. The host range of *Agrobacterium* is not restricted to plants only. *Agrobacterium* is able to transfer DNA also to other bacterial species from the same family, *Rhizobiaceae*, as well as to other microorganisms, such as yeasts *S. cerevisiae*, filamentous fungi or cultivated mushrooms. Most recently, transfer of DNA from *Agrobacterium* to human cells has been documented.