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# 12 Receptors

## *Structure, Function, and Pharmacology*

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### 12.1 INTRODUCTION

Communication between cells is mediated by compounds such as neurotransmitters and hormones which upon release will activate receptors in the target cells. This communication is of pivotal importance for many physiological functions, and dysfunction in cell communication pathways often has severe consequences. Many diseases are caused by dysfunction in the pathways, and in these cases, drugs designed to act at the receptors can have beneficial effects. Thus, receptors are very important drug targets.

The first receptors were cloned in the mid-1980s and since then hundreds of receptor genes have been identified. Based on the sequence of the human genome, it is currently estimated that more than one thousand human receptors exist. Almost all receptors are heterogeneous, meaning that several receptor subtypes are activated by the same signaling molecule. One such example is the excitatory neurotransmitter glutamate. As shown in Figure 12.1, the amino acid sequence of the glutamate receptors varies and the receptors form subgroups, which, as will be discussed in Chapter 15, share pharmacology.