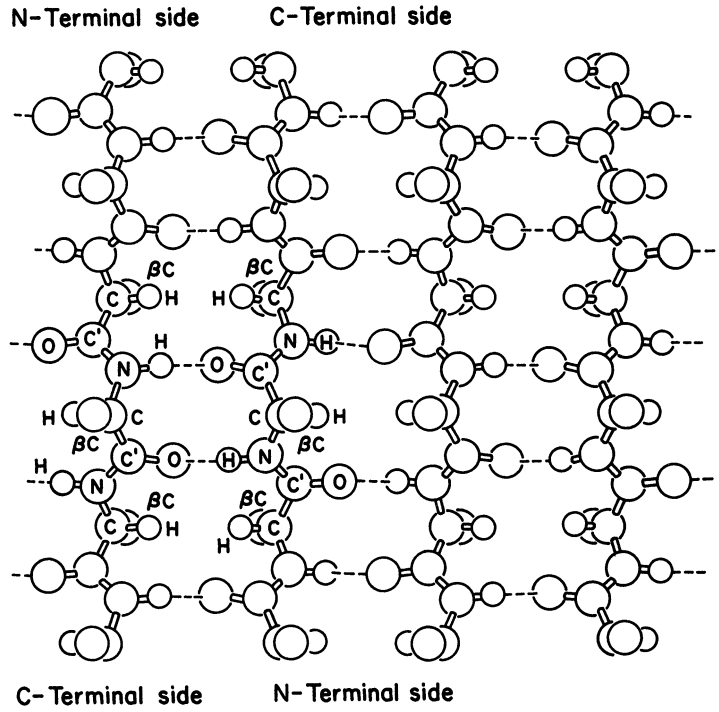

Figure 2.11. Representation of an antiparallel β-pleated sheet. Dashed lines indicate hydrogen bonds between strands.

these subunits results in a quaternary structure. The forces between polypeptide chains can be disulfide bonds or other weak interactions. The subunit structure of enzymes has an important role in the control of their catalytic activity.

Antibodies or *immunoglobulins* are proteins that bind to particular molecules or portions of large molecules with a high degree of specificity. Antibody (Ab) molecules appear in the blood serum and in certain cells of a vertebrate in response to foreign macromolecules. The foreign macromolecule is called the *antigen (Ag)*. The specific antibody molecules can combine with the antigen to form an *antigen–antibody complex*. The complex formation between Ag and Ab is called the *immune response*. In addition to their obvious clinical importance, antibodies are important industrial products for use in diagnostic kits and protein separation schemes. Antibodies may also become a key element in the delivery of some anticancer drugs. Antibodies have emerged as one of the most important products of biotechnology.

Antibody molecules have binding sites that are specific for and complementary to the structural features of the antigen. Antibody molecules usually have two binding sites and can form a three-dimensional lattice of alternating antigen and antibody molecules. This complex precipitates from the serum and is called *precipitin*. Antibodies are highly specific for the foreign proteins that induce their formation.