Steroid hormones control a wide range of normal biological processes but are also implicated in several disease processes including reproductive disorders, inflammation, diabetes, cardiovascular disease, and hormone-dependent cancers of male and female reproductive tissues. Synthetic steroids that act as agonists or antagonists are used widely as pharmacologic agents. The way steroids gain access to their target tissues is poorly understood, but is influenced primarily by two high affinity steroid-binding proteins in the blood: corticosteroid binding globulin (CBG) and sex hormone-binding globulin (SHBG). These two plasma proteins bind the glucocorticoids and sex steroids, respectively. By using a combination of molecular biological, biochemical and physiological approaches we have gained insight into how CBG and SHBG are produced and function with respect to normal development and aging; how they are involved in disease processes, and how they can be exploited in the context of personalized medicine and target drug delivery.