

**FIGURE 3.26**

Hydrophobic cavity (a) and hydrogen bonding interactions (b) in the ciproterone acetate–androgen receptor complex. Generated from Protein Data Bank reference 2OZ7 and displayed with Chimera 1.8.1.

In another family of antiandrogens, the previously mentioned pseudo five-membered ring has been replaced by hydantoin or thiohydantoin moieties. Members of this class of compounds include nilutamide, enzalutamide, and ARN-509. Nilutamide (Nilandron<sup>®</sup> and Anandron<sup>®</sup>) has the advantage over flutamide of having a higher half-life that allows its administration only once daily. Enzalutamide (MDV3100, Xtandi<sup>®</sup>) is another androgen receptor antagonist<sup>62</sup> that has a higher affinity for the androgen receptor than the first-generation nonsteroidal antiandrogens. It was approved by the FDA in 2012 for the treatment of CRPC and has been shown to reduce the progression of the disease by more