antibacterial activity; however, antibiotics are highly effective when given at the onset of disease onset. Thus, it was not possible to determine the added benefit over the antibiotic alone or as monotherapy treatment.

19.2.2 Bezlotoxumab Versus *Clostridium difficile*

Clostridium difficile infection (CDI) is the most common hospital-acquired infection and is associated with increased hospital costs. Although *C. difficile* spores are present in the gut innocuously, due to repeated broad-spectrum antibiotic therapy, spores germinate along with the release of exotoxins A and B, resulting in mild to severe diarrhea. Treatment options for recurrent CDI are limited and new alternatives to prevent recurrent CDI is required.

In 2016, the FDA approved the use of bezlotoxumab, an emergent mAb therapy to prevent recurrent CDI. Bezlotoxumab is a human mAb directed against *C. difficile* toxin B (TcdB). This procedure prevents the recurrent risk of CDI, collaborating for the recovery of the intestinal microbiota.

19.2.2.1 Treatment and Mechanism of Action

Antibiotic therapy is extended by adding humanized antibody bezlotoxumab so as to prevent the action of exotoxins A and B, respectively, since they provide passive immunity. Bezlotoxumab inhibits specifically the N-terminal CROP domain of TcdB region. The CROP domain is composed of four different peptide units: B1, B2, B3, and B4. Bezlotoxumab recognizes a specific epitope in TcdB and has a high affinity for that region. The GTD domain does not interact with bezlotoxumab, but seems to interact with B1, which is representative of the entire CROP domain. Bezlotoxumab interacts with B2 and B3 or with residue region overlapping between both domains. B4 does not interact with the specific CROP domain portion. The characterization of peptide B1 as a full TcdB CROP domain suggests that the antibody reacts specifically with CROP domain B2 region. This leads to the conclusion that TcdB epitope lies within the N-terminal region of CROP domain.

19.2.3 Panobacumab Versus *Pseudomonas aeruginosa*

Pseudomonas aeruginosa is an opportunistic pathogen causing infection-related mortality and morbidity in immunocompromised patients due to antibiotic resistance. Multidrug-resistant (MDR) *P. aeruginosa* may cause life-threatening conditions, such as ventilator-associated and hospital-acquired bacterial pneumonias, as well as bloodstream and urinary tract infections in susceptible patients. Thus, designing an appropriate antimicrobial therapy may be a clinical dilemma due to scarcity of effective and safe drugs that may fight MDR *P. aeruginosa* strains.