addition, disinfectants containing free bacteriophages can be useful for the removal of bacterial biofilms (Gutierrez et al. 2016). Although numerous studies confirm the promising results of phage preparations, no legal framework has been developed yet to allow their use in clinical environments.

22.4.3.2 Enzymes

Disinfectants containing enzymes with hydrolytic or oxidative activities can be used to remove pathogenic microorganisms. For example, laccases, haloperoxidases, and perhydrolases generate biocidal oxidants and peracetic acid. In addition, these enzymes can be incorporated in nanoparticles made of silica, gold, and/or carbon nanotubes, which may significantly increase their stability (Grover et al. 2013). More recently, bacteriophage-encoded enzymes have also been proposed as promising disinfectants, especially to facilitate the removal of bacterial biofilms. Thus, phage endolysins have displayed *in vitro* anti-biofilm activity against major clinical pathogens (Shen et al. 2013; Gutiérrez et al. 2014). Moreover, some phage exopolysaccharide depolymerase proteins have the ability to degrade extracellular material from bacterial biofilms (Gutierrez et al. 2015; Pires et al. 2016).

22.4.3.3 Bacteriocins

Many bacteria synthesize antimicrobial peptides that inhibit growth of putative competitors. Specific attention has been paid to bacteriocins synthesized by nonpathogenic lactic acid bacteria because they are active against several Gram-positive pathogens of clinical relevance, including antibiotic-resistant bacteria. Moreover, some bacteriocins like nisin have a long history of safe use as food biopreservatives that strongly support their potential use in clinical applications (Shin et al. 2016). The antimicrobial activity of bacteriocins against biofilms has been recently investigated, and nisin has been proved to inhibit the growth of MRSA biofilms on medical devices (Okuda et al. 2013).

22.5 Current Legislation

Disinfectants are used to kill living organisms and, not surprisingly, often pose a risk of toxicity to humans or the environment. For this reason, their commercialization and application must be strictly controlled. To accomplish this goal, most countries require the authorization or at least notification of a disinfectant product before it can be placed on the market. Besides safety, regulatory frameworks also aim to ensure efficacy of the products.

In the European Union, disinfectants are regulated under the Biocidal Products Regulation 528/12 (BPR, http://eur-lex.europa.eu/legal-content/EN/