of AgNPs in aqueous solutions have been characterized by UV-vis spectroscopy, contact angle measures, atomic force microscopy (AFM) observations, and leaching tests in water. The in vitro performance of these surfaces against the biofilm formation by *Staphylococcus epidermidis* bacteria strain has been evaluated. Even if these first results could have been confirmed in a more complex environment, the AgNP monolayers described above exhibited a persistent linkage to the glass surface, appropriate stability in aqueous solutions, useful Ag^+ ions release, and good antiinfective properties.

Besides silver, other metals have been investigated for their antibacterial action and included into bioactive glass formulations. For example, copper has been introduced in different glasses, both as metal ions and metal nanoparticles, using different technologies already described for nonbioactive glasses and adapted for bioactive ones. Abou Neel et al. (2005) developed copper oxide (CuO)-containing phosphate-based glass fibers for their possible use in wound healing applications. Glasses in the Na_2O-CaO-P_2O_5 system (degradable in an aqueous environment) were produced by melting and quenching, followed by remelting and custom fiber drawing with different diameters and amounts of CuO in substitution of Na_2O. The amount of CuO and fiber diameters were investigated for their effect on the structure and antibacterial properties of the glass, and have been related to both their rate of degradation and copper ion release.

The ionic exchange in aqueous solutions was successfully used for the first time by Miola and Verné (2016) to introduce copper in two different bioactive glasses. This method, normally used to introduce monovalent ions or, for copper, performed in molten salts, was not previously applied to bioactive glass compositions. Various Cu salt solutions (copper(II) nitrate, chloride, acetate, and sulfate) at different concentrations were used in order to introduce copper ions in the glass network. By tailoring the glass composition and the ion-exchange conditions (type of the copper salt and its concentration), it was possible to introduce copper as ionic Cu(II) species in the amorphous network and as copper salt precipitates. Cu-doped bioactive glasses maintained their bioactivity and acquired the ability to limit bacteria adhesion and proliferation against *Staphylococcus aureus* (Miola and Verné, 2016).

Copper was also introduced into bioactive glass-based scaffolds by a different approach, based on the fabrication of boron-containing bioactive glass-based scaffolds, coated with alginate cross-linked with copper ions (Erol et al., 2012). In this case, scaffolds were first made by the foam replica method and, in a second step, they were dip coated with sodium alginate cross-linked with copper ions. This formed a homogeneous coating which improved the scaffold bioactivity and mechanical properties, allowing controlled release of copper ions.

The foam replica technique was also used to prepare macro/mesoporous copper-loaded bioactive glass scaffold, by incorporating various amounts of Cu to replace Ca into mesoporous bioactive glasses, using *co*-templates of nonionic block polymers and polyurethane sponges (Wu et al., 2013d). These scaffolds