deep wounds with moderate drainage and can be changed every 3 (amorphous form) to 7 days (gel sheets) (Hess 2008; Ovington 2007). Povidone-iodine loaded hydrogel dressings became very popular as well, such as Vigilon™ (Bard, distributed by Seton Healthcare Group plc), and are claimed to inhibit bacteria growth and proliferation at the wound site (Mertz et al. 1986).

Future hydrogel technologies

Academia is the cradle of new ideas and exciting findings par excellence, which has always inspired industry. Many research projects for the development of advanced wound care technologies have been successful resulting from productive collaborations between academia and industry, and have led to significant progress in the field (Salcido 1999). From simple dressings, hydrogels become systems for the delivery of agents that can accelerate the healing process and actually make a big difference to the condition of patients. Gong et al. (Gong et al. 2013) proposed a thermosensitive *in situ* forming hydrogel containing curcumin-loaded micelles, which reported very good *in vitro* wound healing activity. The composite made of poly(ethylene glycol)-poly(ε-caprolactone)-poly(ethylene glycol) (PEG-PCL-PEG), would gel at body temperature adhering to the tissue and offering a sustained release of curcumin over a period of 14 days. Curcumin (extracted from the rhizome of *Curcuma longa*) has been used as a traditional medicine in Southeast Asia for its anti-oxidant, anti-bacterial and anti-inflammatory activities. However, it has poor solubility in water and oral bioavailability, problems that have been bypassed using this system (Gong et al. 2013). Miguel et al. (Miguel et al. 2014) presented an *in situ* thermoresponsive and antimicrobial chitosan-agarose hydrogel that accelerates skin regeneration. *In vitro* (using human dermal fibroblasts), and *in vivo* (using Wistar rats) testing reported, shows that this material is able to allow cell migration and proliferation, and to enhance autolytic debridement, promoting re-epithelization. Patients with burns can present particularly unpleasant scarring and may benefit from formulations such as this (Miguel et al. 2014). Burns can also have prolonged recovery (up to 10 weeks) especially when the dermis is compromised (full and partial-thickness burns).

Loo et al. (Loo et al. 2014) designed a very interesting hydrogel, formed from ultrashort peptides (motif composed of three to seven aliphatic amino acids) in a nanofibrous network, that can be used as a primary dressing for these types of burn injuries. These peptides undergo self-assembly in aqueous conditions and can retain up to 99.9% of water, as the peptides convert into hydrogels, they are able to keep the wound hydrated and can be removed easily. The resemblance of the network formed with the ECM facilitates cell adhesion and tissue regeneration, resulting in a faster healing when compared with the standard dressing (Loo et al. 2014). Reyes-Ortega et al. (Reyes-Ortega et al. 2015) loaded a gelatin/hyaluronic acid hydrogel with proadrenomedullin N-terminal 20 peptide (PAMP). This peptide naturally occurs in the skin and it is known for its proangiogenic, anti-inflammatory and antibacterial activities. The system presented in this work is composed of two different sections, both bio-functionalized. The external layer is made of polyurethane and loaded with bioresorbable nanoparticles containing bemiparin (low molecular weight form of heparin able to complex with growth factors such as FGF and VEGF enhancing their