Cartilage defects are still a major problem since the foundation of medicine. From Hippocrates to today, many technics were tried to cure the cartilage defects. However, the best results were achieved with tissue engineering and regenerative medicine approaches. Cell therapies including autologous chondrocyte implantation or stem cells and different types of scaffolds with and without cells created new hope for cartilage regeneration. Although these technologies reached a certain level of success, there are also limitations of these technologies. The novel technologies enable injectable scaffolds, which reduce the necessity of open surgery. Also, biotargeted systems increased the effectiveness of injectable scaffolds. The new biotargeted injectable microspheres including encapsulated cells can form new tissues in situ. In the near future, tissue engineering approaches including open surgery will leave their places to the new materials/technologies that can be applied minimally invasively.