A composite scaffold composed of collagen nano-fiber on amniotic membrane for bioartificial periodontal ligament

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Various biodegradable scaffolds have been used for the development of bioartificial periodontal ligament (Bio-PDL), but those scaffolds were focused on cell growth and differentiation only, and could not function as guided tissue regeneration (GTR) membrane which can inhibit gingival cells migration. So, in this study we tried to make a composite scaffold composed of collagen nano-fiber on amniotic membrane (AM) using electrospinning for dental tissue engineering. We could make a composite scaffold whose breaking load was 1 ± 0.3 N superior to nano-fiber scaffold without AM (0.1 ± 0.05 N). After seeding of PDL cell on each scaffold, they attached and proliferated well on both scaffolds. However nano-fiber scaffold without AM was contracted after 5 days of culture, but composite nano-fiber scaffold was not contracted during all culture days.Composite nano-fiber scaffold made by electrospinning collagen fiber on AM will be a suitable substrate for PDL cell culture finally resulting in a good Bio-PDL.