

## Drug Releasing Porous Biodegradable Membranes for Guided Tissue Regeneration

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In order to achieve a new modality for guided tissue regeneration(GTR), biodegradable membranes composed of porous poly(L-lactide)(PLLA) films and poly(glycolide)(PGA) meshes were prepared using a phase inversion technique. PLLA dissolved in methylene chloride-ethylacetate mixtures were cast on the knitted PGA mesh, regular pores were formed in the membranes. Flurbiprofen, tetracycline and PDGF-BB, that are used in periodontal therapy for their tissue regenerating effects, were loaded in the membranes. The drug release kinetics mainly depended upon hydrophobic-hydrophilic properties of the drugs and porosity of the membranes and demonstrated proper profiles for GTR. Cytotoxicity for the drug loaded membrane were tested by rapid colorimetric assay for cellular growth and survival, and the tissue response and biodegradability were observed upto 8 weeks after implanting of the membranes in the dorsal skin of the rat. Minimal cytotoxicity was observed in 10% drug loaded membrane. In histologic finding of tissue response, many inflammatory cell infiltration was observed around PLLA membranes after 1-2 weeks of implantation. Connective tissue invasion and initiation of perforation were observed from 6weeks after implantation, and segmentation was initiated from 8weeks after implantation. Ability for guided tissue regeneration of the membranes was examined by measuring new bone formation in the calvarial defects of the rats 5 weeks after membrane implantation. Tetracycline and PDGF-BB loaded membranes were markedly effective for the bone regeneration guiding potential. Drug loaded biodegradable barrier membrane might be a potential tool for GTR in periodontal therapy.