Dermatological problems are a major part of pathological conditions that need to be addressed, and the way to deal with them evolves constantly. An attempt is being made for more specialized treatment of burns and skin regeneration to cosmetic use. The need to create a specialized method that can controllably transport medicine only where is needed, has led to the construction of biodegradable and non-toxic, localized, controlled-release drug delivery scaffolds. In this study, a Drug Delivery Nanoplatform of polymeric Polylactic acid (PLA) and Chitosan scaffolds, loaded with curcumin drug and aloe vera extract has been fabricated via Electrospinning process. The surface structure of the scaffolds was observed using Scanning Electron Microscope and Atomic Force Microscope. The wetting ability and hydrophobicity were studied by contact angle measurement. The cytotoxicity of drug–loaded scaffolds on fibroblasts was investigated in vitro, using MTT proliferation assay and Methylene Blue staining, showing excellent compatibility. Cell immobilization and observation by SEM were also performed, to confirm the cell proliferation. The release behavior of both drugs from the nanoid platform exhibited a triphasic release pattern, except for Aloe vera nanoplatform, which exhibited diphasic release pattern, and the degradation rate of the drug loaded scaffold was higher than blank scaffold. To get the research work one step further, GFP protein immobilization on the nanofibers was successfully accomplished by EDC-NHS chemical method, thus achieving to prove that the biofunctionalization of the fibers can occur. This felicitous approach may be the priming treatment of dermatological malfunctions and alleviate patients' needs.