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On the characterization of Fucoidan on Sodium alginate/gelatine scaffolds for anti-inflammation in neuroscience

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Microglia, which is the immune cells of the central nervous system (CNS). Overexpression of inflammatory mediators by microglia can induce of several neurological diseases. Thus, bases on the requirement of the key in neural tissue engineering are to develop materials with little or no effect to neuroinflammation. In this study, we have developed a method to create three-dimensional (3D) scaffolds by added fucoidan into porous sodium alginate/gelatin (SaGFu). For mechanical characterization such as *in vitro* degradation, stress/strain, swelling test, and pore size were measured. Moreover, we studied the neuroinflammatory effects of SaGFus on BV2 microglia cells. The effect of gelatin and fucoidan content on the various properties of the scaffold is investigated and the results showed that mechanical properties increased porosity and swelling ratio to the increase in the gelatin and fucoidan adding, while the *in vitro* biodegradability decreased. The average SaGFus diameter attained by fabrication of Sa/gelatin/fucoidan main ranged from 60±18 to 100±16 um with high porosity (64.44–78.30 %). Cell culture tests, carried out using gelatin 2.0 % and 4.0%, showed a good cell proliferation more than 60–80 % of sodium alginate alone. Following stimulation with 0.5 μg/mL LPS, microglia cultured in 3D SaGFus decrease their expression of NO. SaG2Fu and SaG4Fu also inhibited the activation and translocation of p65 NF-κB protein levels, resulting in reduction of NO and PGE2 production. These results provide insights into the diverse biological effects and open new opportunity for the applications of SaGFus in neuroscience

Biography

Van-Tinh Nguyen has completed his PhD from the Department of Biomedical Engineering, Pukyong National University, Korea. He has completed his graduation in 2012 from the University of Chosun and his current research interests include: Isolation, safety and bioavailability of bioactive materials and; Development of marine-integrated cells and tissue regenerative biomedical substances.

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