

BIOCOMPOSITE BASED ON TYPE I COLLAGEN AND ALOE VERA, COMPLEXED WITH SILVER NANOPARTICLES OBTAINED BY GREEN SYNTHESIS FROM AQUEOUS CINNAMON SOLUTION, WITH REGENERATIVE EFFECT ON HUMAN SKIN FIBROBLASTS

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RO135298A3/
30.01.2023

Fields of application:
Medicine

The invention relates to a biocomposite with regenerative effect on human skin fibroblasts. According to the invention, the biocomposite is made of silver nanoparticles obtained by green synthesis in cinnamon aqueous extract (NpAg-SCO) combined with type I collagen extracted from fish tails (*Hypophthalmichthys molitrix*), sodium alginate and aloe vera gel, resulting in a transparent gel which is soluble in aqueous media, with cell proliferation stimulating effect at a concentration ranging between 1...100 mg/mL.

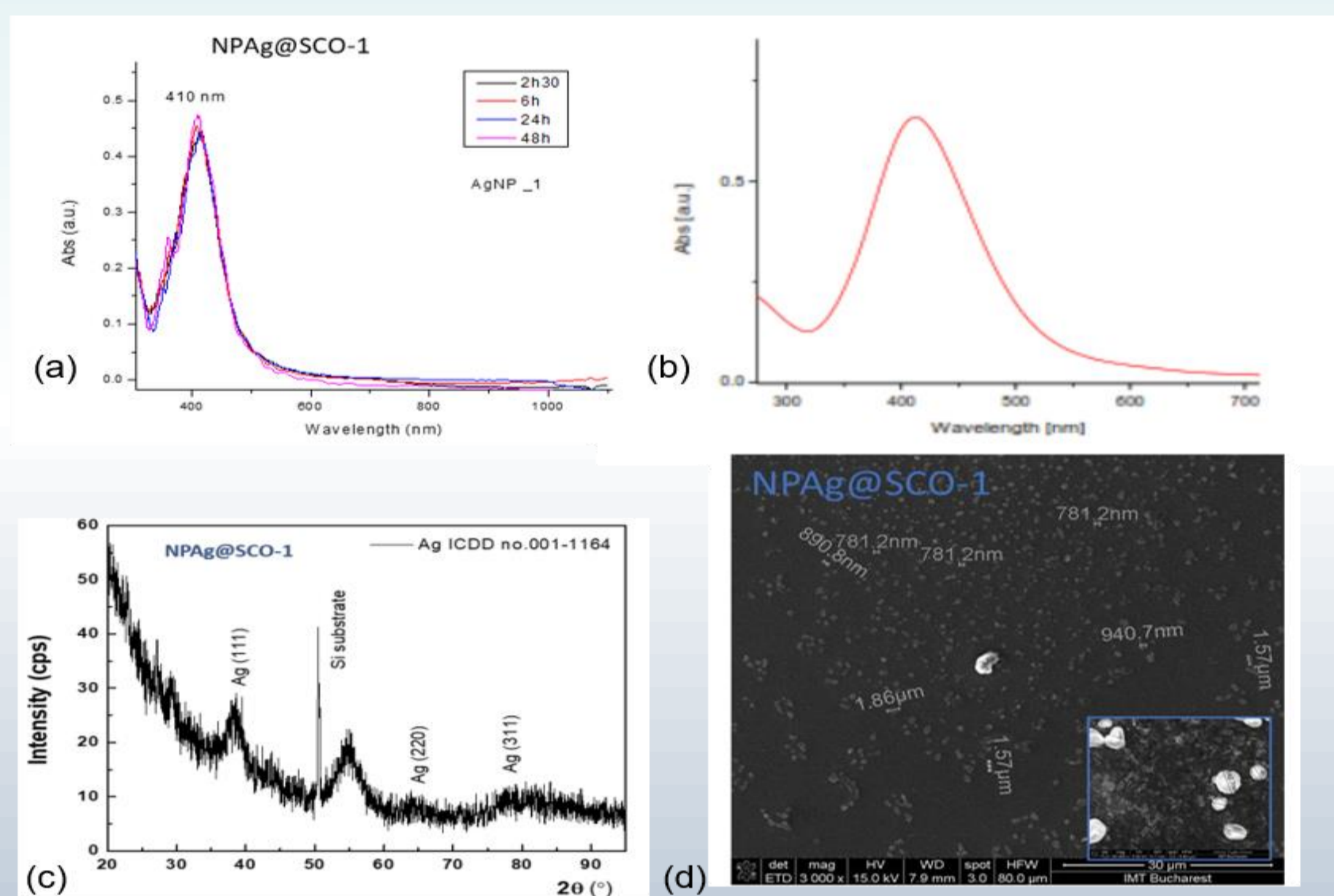


Figure 1. Characterization of silver nanoparticles obtained by green synthesis from aqueous cinnamon extract. (a) Short-term (48h) and long-term (b) (21 days) UV-VIS spectrum of NpAg. (c) XRD profile of NpAg colloidal solution. (d). SEM characterization of NpAg.

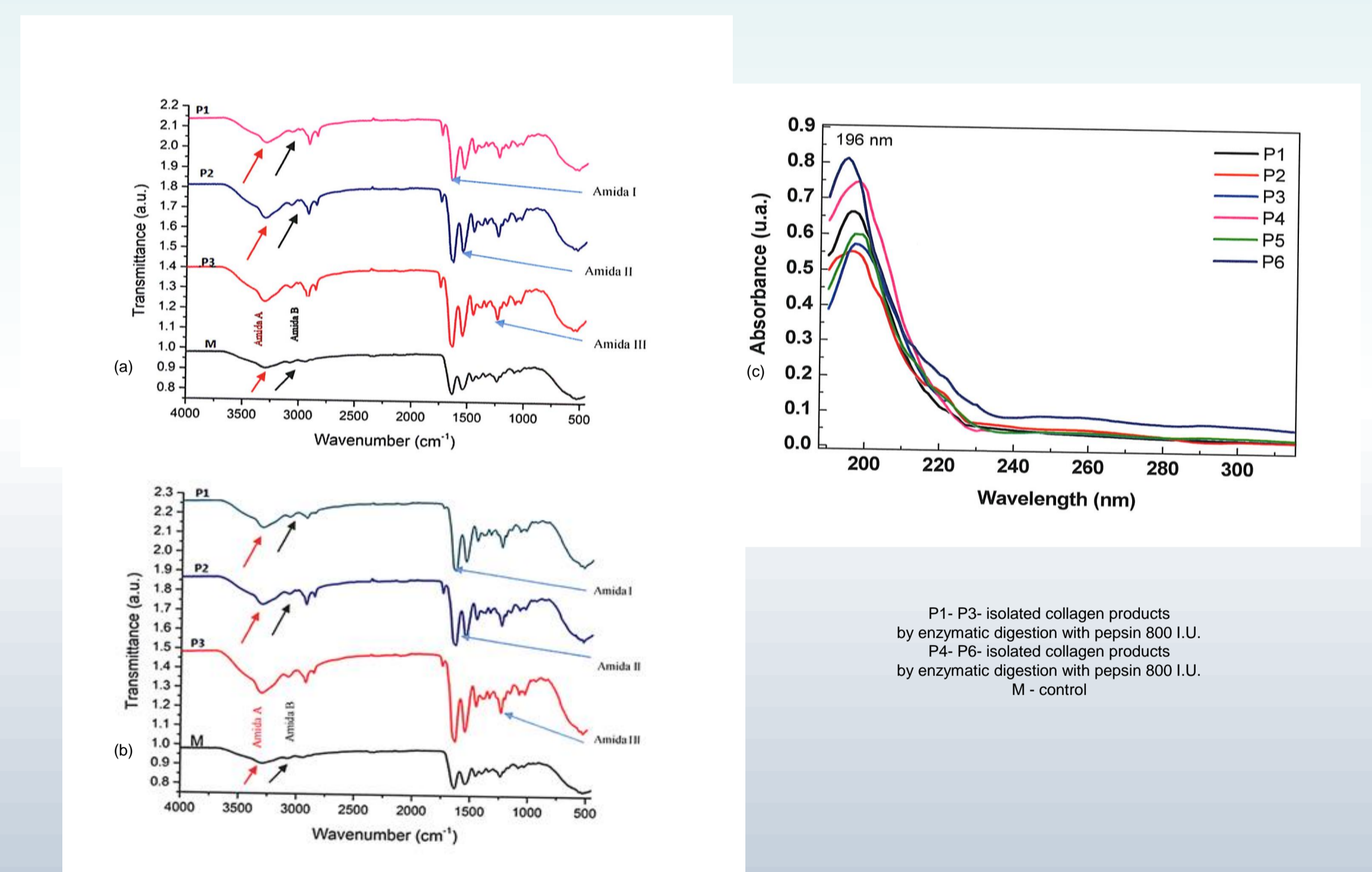


Figure 2. Characterization of collagen species obtained from fish. (a). FTIR spectra of lyophilized collagen obtained by enzymatic digestion with pepsin 800 I.U. (b). FTIR spectra of lyophilized collagen obtained by enzymatic digestion with pepsin 1200 I.U. (c) UV-VIS absorption spectra of collagen obtained by enzymatic digestion.

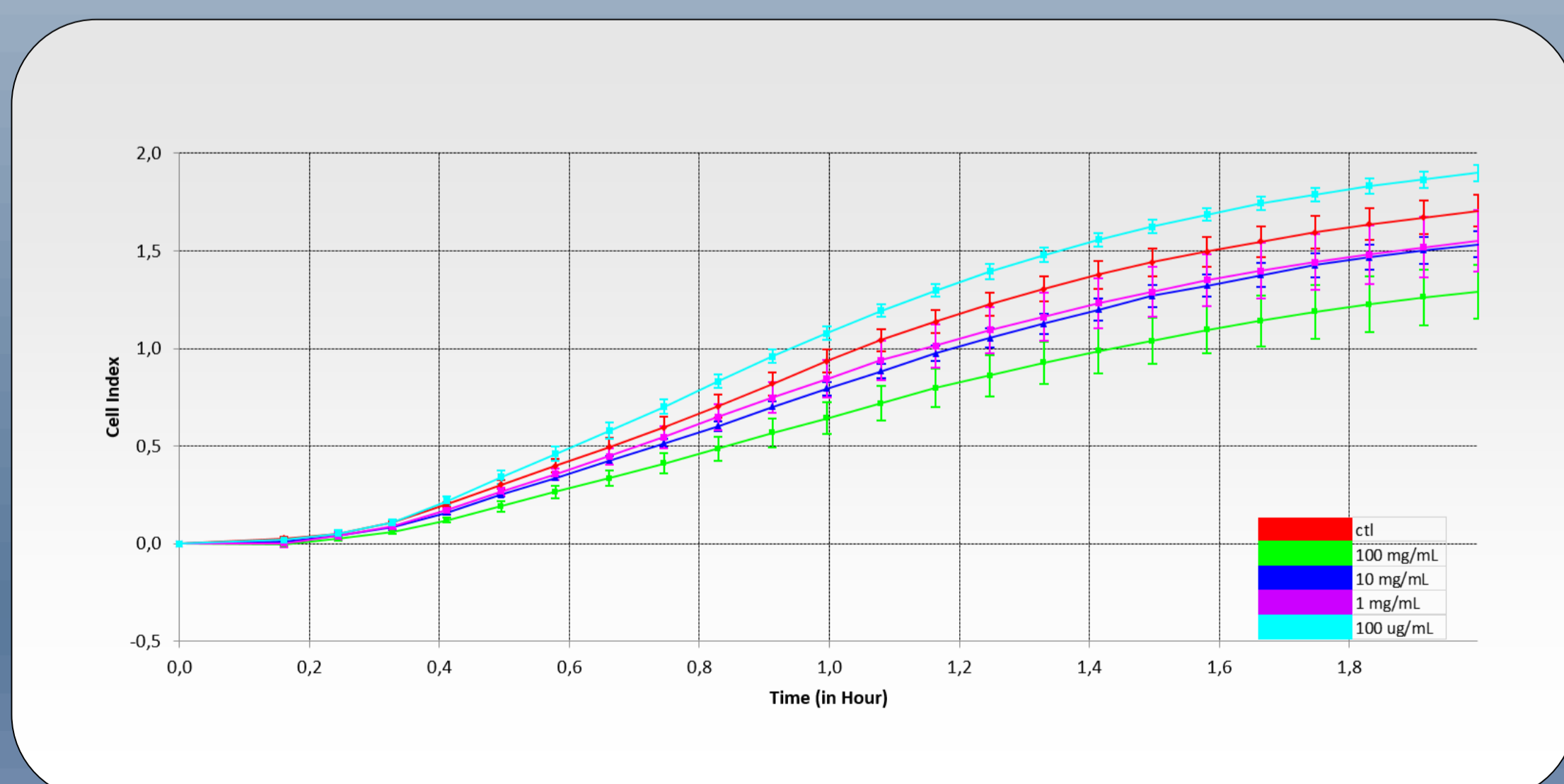


Figure 4. Measurement of adhesion of normal human fibroblasts in the presence of the selected bionanocomposite. Adhesion was quantified by real-time electrical impedance measurement in the presence of 4 successive dilutions of biocompound. The 0.1 mg/mL dilution is observed to stimulate cell adhesion.

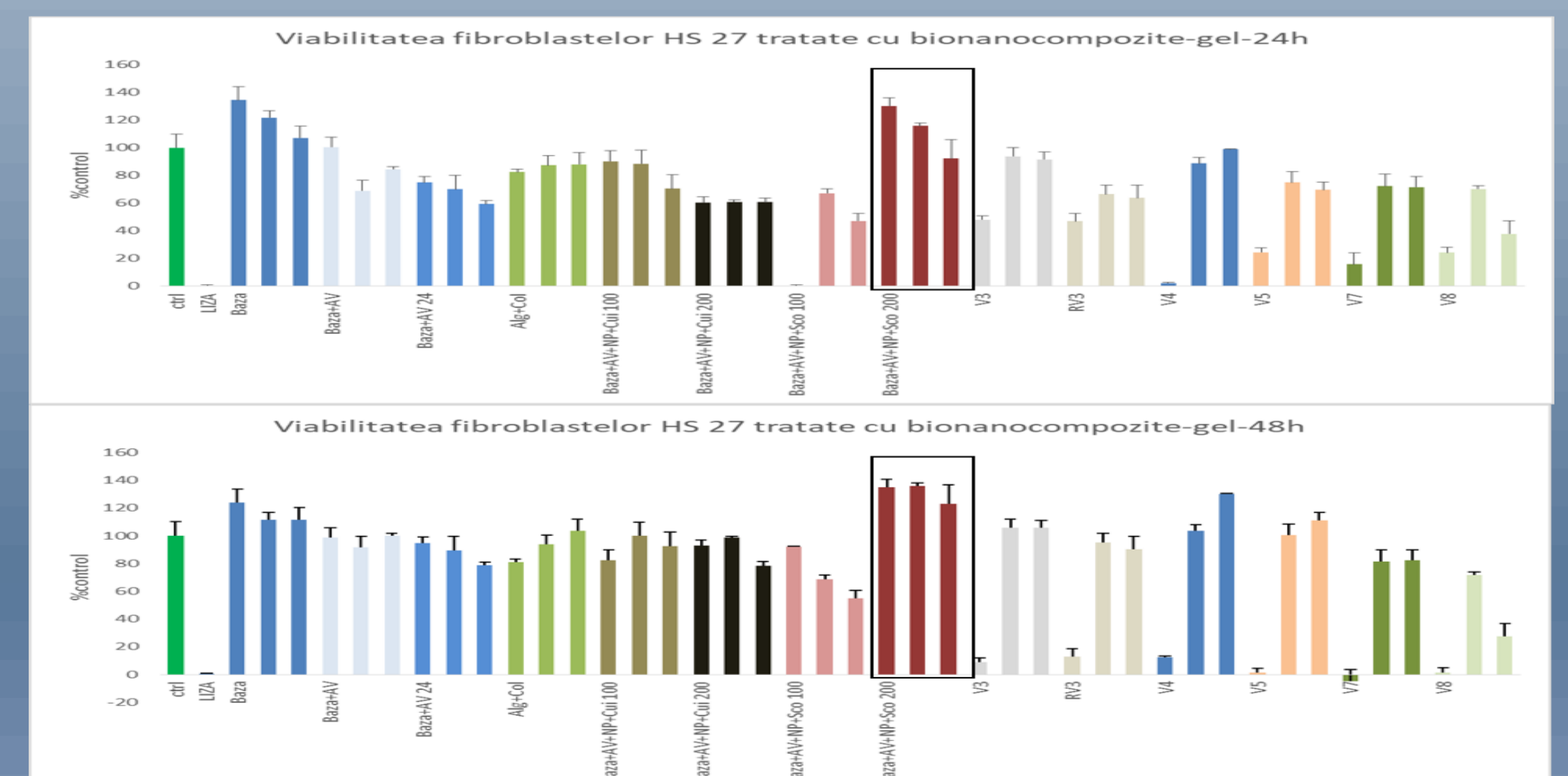


Figure 3. Viability measurement of HS27 normal human fibroblasts treated with various bionanocomposites for 24 and 48h. The bionanocomposite is marked by a black border. Three successive dilutions were tested (from left to right 100 mg/mL, 10 mg/mL and 1 mg/mL).