عنوان مقاله:

Stimulation of Cardiomyocyte by Light

محل انتشار:

چهارمین کنگره بین المللی و ششمین کنگره ملی زخم و ترمیم بافت (سال: 1398)

تعداد صفحات اصل مقاله: 1

نویسندگان:

Hoda Keshmiri Neghab - *Institute of Biochemistry and Biophysics, University of Tehran, Tehran, Iran Department of Photo Healing and Regeneration, Medical Laser Research Center, Yara Institute Academic Center for Education, Culture and Research (ACECR), Tehran, Iran*

Ali Akbar Saboury
Gholamreza Esmaeeli Djavid
Majid Pornour
Jun Hong
Bahram Goliaei

خلاصه مقاله:

Background: Electrical stimulation is the standard technique for exploring electrical behavior of heart muscle, but this approach has considerable technical limitations. Here we report expression of the light-activated cation channel channelrhodopsin-2 for light-induced stimulation of heart muscle in vitro.Methods: For this purpose, primary cardiomyocytes (CM) were isolated and lentiviral delivery of ChR2 (H134R) in cardiomyocytes was done by infection. A stable channelrhodopsin-2 (ChR2) expressing cardiomyocyte was developed, characterized and used. Optical imaging of voltage or calcium was performed using voltage-sensitive dye Di-8-ANEEPPS, and intracellular calcium was imaged with Fura2-AM.Results: Our result demonstrated that following blue-light illumination CM-ChR2 exhibited 26% ($P < 0.05$) enhancement of membrane potential as a result of depolarization compared with non-stimulated samples and 43% elevation of intracellular calcium compared with the non-stimulated group was observed.Conclusion: This method enabled precise localized stimulation and constant prolonged depolarization of cardiomyocytes resulting in alterations of membrane potential and Ca2+ homeostasis

کلمات کلیدی: