

## عنوان مقاله:

Evaluation of two factors on hyaluronic acid production by mutant strain of *Streptococcus equisimilis* by response surface methodology

## محل انتشار:

بیست و یکمین کنگره بین المللی میکروب شناسی ایران (سال: 1399)

تعداد صفحات اصل مقاله: 1

## نویسندگان:

Alireza Fayazi - *biology department, science and research branch, islamic azad university, Tehran*

Malihe Keramati - *Nano-Biotechnology Department, Pasteur Institute of Iran, Tehran*

## خلاصه مقاله:

**Background and Aim :** Hyaluronic acid (HA) as a biodegradable, biocompatible, non-immunogenic linear polysaccharide has been used in many applications such as pharmaceutical, clinical and cosmetics. Currently, commercial HA for human use is mainly produced by fermentation, specifically using *Streptococcus* sp. In present study we improved HA production by mutant strain of *Streptococcus equisimilis* as one of the best strains producing hyaluronic acid capsule. Two of the most important factors in medium culture are pH and temperature. The most frequently used optimization strategy is "one-at-a-time" strategy. This approach is not only time consuming, but also ignores the combined interactions between physiochemical parameters, so in this study we optimized this two factors in medium culture conditions by response surface method. RSM combines statistical experimental designs and empirical model developing by regression with a purpose of process or product optimization. **Methods :** In first step we used the Minitab 17 software to design of experiment in RSM by Central composite design (CCD) method. Maximum and minimum values were also considered according to recent studies. Minimum level for temperature was determined 30°C and maximum level 37°C, as well as minimum level for pH was determined 5.5 and maximum level 8.0. Finally, experiment was carried out with 14 run, 2 block and 6 center points. In the next step the primary seed of *Streptococcus equisimilis* were cultured in Todd Hewitt Broth for 16 h. The production medium containing Na<sub>2</sub>HPO<sub>4</sub>·12H<sub>2</sub>O, KH<sub>2</sub>PO<sub>4</sub>·5H<sub>2</sub>O, MgSO<sub>4</sub>·7H<sub>2</sub>O, yeast extract, and glucose was inoculated by 10% of seed at OD<sub>600nm</sub> 1, and incubation for 6 h of HA production (in 180 RPM, 37°C). Then, HA was precipitated by A special method. The amount of proteins and nucleic acids was assayed at OD<sub>280nm</sub> and OD<sub>260nm</sub>. The HA concentration was determined by complexometry method using carbazole assay at 550 nm. Finally, HA values was evaluated by the MINITAB 17 software. **Results :** Finding showed that the yield of HA extracted from *Streptococcus equisimilis* in medium culture with pH: 8.0 and temperature 37°C is 3.27 mg/ml and its yield was more than other values of pH and temperature. **Conclusion :** This suggested that we optimized temperature and pH in medium components with central composite design (CCD) method for high production of HA.

## کلمات کلیدی:

Hyaluronic acid, *Streptococcus equisimilis*, Carbazole, response surface methodology, central composite design

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1255016>



