

Effect of Environmental Factors on Production of Hyaluronic Acid by *Streptococcus zooepidemicus*

黃怡倩、吳建一

E-mail: 9510790@mail.dyu.edu.tw

ABSTRACT

Hyaluronic acid composed of repeating disaccharide units of D-glucuronic acid and N-acetylglucosamine. Because of its special biocompatibility, moisture-holding function and extraordinary rheological property, it has been used as biomedical, cosmetic industry and other relevant fields. The effect of various cultures on glucose concentration, agitation speed, aeration rate and added various components of hyaluronic acid (HA) production by *Streptococcus zooepidemicus* was studied. And the effects of fermentation process variables on volumetric mass transfer coefficient (kLa) in agitation speed and aeration rate conditions were investigated. The result exhibited that glucose concentration of 20 g/L had the maximum yield of HA (0.61 g/L), and 30 % of the glucose was converted to HA and biomass. That known suitable glucose concentration in the medium can help *Streptococcus zooepidemicus* strain grow and improved the HA yield. Under agitation and intermittent aeration (IA) conditions, IA gave superior results compared to agitation. Anaeration - aeration = 24 h - 24 h of IA had the maximum yield of HA (0.61 g/L); Evaluation of experimental data also shows kLa value are significantly affected by process of agitation speed and aeration rate. The results are presented in added various components was slightly affected the HA yield. The controlled of medium pH can also improve yield of HA and biomass. In addition, the physiognomy of colonies also could effect the HA quantities. The purified samples were characterized by a fourier transform infrared (FTIR) spectroscopy, a nuclear magnetic resonance (NMR), gel permeation chromatography (GPC). The results show that the purified sample from the fermentation liquid was HA. In this study, we investigate a bioprocess for the production of HA with high productivity by the immobilized-microorganism beads. The results show that PVA has the potential for cell-immobilizing materials.

Keywords : Hyaluronic acid ; *Streptococcus zooepidemicus* ; immobilization

Table of Contents

封面內頁 簽名頁 授權書.....	iii
中文摘要..	iv
英文摘要...	vi
誌謝.....	viii
目錄.....	x
圖目錄.....	xv
表目錄.....	xix
第一章 前言	1
第二章 文獻回顧	5
2.1 黏多醣物質特性	5
2.1.1 黏多醣的化學組成	5
2.1.2 黏多醣的純化方法	9
2.2 HA 之簡介	10
2.2.1 HA 的來源	10
2.2.2 HA 的物理特性	11
2.2.3 HA 生化合成機制	13
2.3 可生產 HA 之微生物菌種-鏈球菌	17
2.4 影響微生物生產 HA 之因子	19
2.4.1 氮源的影響	20
2.4.2 碳源的影響	21
2.4.3 溫度的影響	23
2.4.4 pH 的影響	25
2.4.5 曝氣/攪拌速率的影響	26
2.4.6 額外添加物之影響	28
2.5 利用代謝工程方法生產高效能之 HA	29
2.6 HA 流變學	33
2.6.1 HA 分子量與黏度的相關性	34
2.6.2 HA 分解後之黏度變化	35
2.6.3 HA 發酵系統中氧氣質傳係數的重要性	36
2.7 HA 應用範疇	37
2.7.1 化妝品之應用	37
2.7.2 臨床醫學上之應用	38
2.7.3 藥物釋放之應用	41
2.7.4 其它方面應用	42
2.8 HA 市場	43
第三章 材料與方法	47
3.1 實驗材料	47
3.1.1 實驗藥品	47
3.1.2 儀器設備	49
3.2 菌株培養	50
3.2.1 菌株來源	50
3.2.2 菌株活化	51
3.2.3 HA 生產培養	51
3.3 生產培養基的探討	52
3.3.1 環境因子之影響	52
3.3.2 添加物之影響	53
3.4 固定化微生物顆粒之製備及基本性質測定	54
3.4.1 批次發酵大量培養	54
3.4.2 固定化微生物顆粒之製備	54
3.4.3 固定化顆粒基本性質	56
3.4.4 固定化菌體顆粒 SEM 觀察	57
3.4.5 吸附試驗	58
3.4.6 固定化菌體顆粒重複批次操作	58
3.5 夾膜染色	58
3.6 分析方法	59
3.6.1 醣類分析	59
3.6.1.1 DNS 法	59
3.6.1.2 酚-硫酸法	60
3.7 HA 之濃度與分子量分析	61
3.7.1 醣醛酸分析	61
3.7.2 膠體滲透層析	62
3.7.3 高效能液相層析儀	63
3.8 純化 HA 之結構確定	66
3.8.1 HA 純化	66
3.8.2 傅力葉轉換紅外線	67
3.8.3 核磁共振	67
3.9 氧氣傳送係數測定	68
第四章 結果與討論	69
4.1 不同 HA 分析方法之比較	69
4.2 環境因子之探討	72
4.2.1 探討攪拌速率和曝氣量對懸浮 <i>S. zooepidemicus</i> 菌株生產 HA 之影響	72
4.2.2 探討間接曝氣操作方式對懸浮 <i>S. zooepidemicus</i> 菌株生產 HA 之影響	77
4.3 探討不同葡萄糖濃度對 <i>S. zooepidemicus</i> 生產 HA 之影響	82
4.4 額外添加物之培養基對懸浮 <i>S. zooepidemicus</i> 菌株生產 HA 之影響之探討	86
4.4.1 抗生素種類之影響	86
4.4.2 Losyyme、nisin、鹽類、界面活性劑和黃豆萃取液之影響	89
4.4.3 黃豆萃取液濃度之影響	93
4.5 菌落與莢膜型態之觀察	95
4.5.1 菌落型態與溶血性之觀察	95
4.5.2 再次培養次數與莢膜形成之相關性	99
4.5.3 靜置、攪拌和曝氣培養之莢膜染色分析	101
4.6 固定化顆粒之基本性質探討	103
4.6.1 不同材料固定化顆粒之物性比較	103
4.6.2 顆粒之吸附試驗	108
4.6.3 顆粒之 SEM 觀察	110
4.7 固定化菌體顆粒之重複批次試驗	117
4.8 HA 之黏度測量	119
4.9 純化 HA 之結構分析與確定	126
4.9.1 純化 HA 之 FT-IR 分析	126
4.9.2 純化 HA 之 NMR 分析	129
第五章 結論	133
參考文獻...	135
附錄.....	157

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