逆境轉錄因子Msn 2對木糖發酵菌 Pichia stipitis 以醇發酵之保護作用

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摘 要

現代工業發展，石化燃料消耗量大幅增加，由於存量有限，因此世界各國積極進行新能源之研究開發。生質能具再生循環使用，其中生質酒精為替代能源之一。生質酒精可替代汽油亦或與汽油混合使用，具有高純度、方便儲存與低危險性等優點，並可減少溫室氣體淨排放量。目前生質酒精能源作物來源為澱粉 (玉米)與蔗糖 (甘蔗)兩種，主要利用葡萄糖 (六碳糖)轉換為乙醇，玉米與甘蔗被移動會影響糧食供給平衡。所以第二代生質能源以木質纖維酒精成為主要發展，木質纖維素的平均組成約含纖維素24 % ~45 % (六碳糖葡萄糖組成)、半纖維素22 % ~31 % (五碳糖木糖組成80 ~85 %)。但常用來發酵的釀酒酵母菌並不能直接利用五碳糖，若可以利用半纖維素，將有助於成本降低及減少農業廢棄物量，降低汙染。P. stipitis是良好的木糖醱酵菌。但P. stipitis 對於酒精耐受度不高，發酵過程中，導致P. stipitis 死亡，可能累積酒精產量不高原因。因此我們試圖找出P. stipitis 逆境轉錄因子並轉染P. stipitis，試圖提高P. stipitis 對於乙醇的耐受度。Msn 2, Msn 4 和Skn7 是已知逆境轉錄因子，透過RT-PCR 半定量分析得知Msn 2, Msn 4 在含乙醇中有提高表現40 %，選殖Msn 2 基因序列構築到pGAPZ (含持續性啟動子)載體，轉形到P. stipitis 內，本實驗中發現P. stipitis 轉型株相較野生型確實提高了乙醇耐受性，其是否增加酒精發酵量，值得進一步研究。 關鍵字: 生質酒精、木糖、P. stipitis

關鍵詞 : 生質酒精、木糖、樹幹畢赤酵母菌

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