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Modulation of Protein Expression Pattern by Genistein in Breast Cancer Cells

Jeong Soon Lee*, Mi Kyung Sung¹, Young Kyoon Kim², Rina Yu³, Jung Hyun Kim, Woo Keun Kim and Jong-Sang Kim.

Animal Science and Biotechnology, Kyungpook National University,

¹Food Science and Nutrition, Sookmyung Women's University,

²Forest Products, Kookmin University, ³FoodScience and Nutrition, Ulsan University

Genistein, one of soybean isoflavones, was reported to have preventive effect against breast cancer development. However, the molecular mechanism of genistein action is not fully elucidated. In this report, we examined protein expression pattern in breast cancer cells incubated in the presence and absence of genistein using 2-dimensional gel electrophoresis, MALDI-TOF, NCBinr database search. Genistein increased the expression of hsp-60 while it suppressed the expression of Bip protein and phospholipase A2 in MCF-7 cells. Expression of HSP-70, Lasp-1 protein and triosephosphate isomerase 1 increased while it suppressed uracil DNA glycosylase in MDA-MB-231 cells. In particular, the post-translational modification of hsp90 appeared to be inhibited by genistein. The hsp90 was shifted to higher pI by genistein treatment without change in its amount. Previous studies have suggested that the inhibition of the 90kDa heat shock protein (HSP90) function lead to the degradation of proteins that require this chaperone for conformational maturation, a retinoblastoma(RB)-dependent G1 block in cancer cells accompanied by differentiation and apoptosis. In MCF-7 cells, genistein inhibited phosphorylation of protein with tyrosine residue such as BiP protein and actin. In conclusion, genistein affected the expression pattern of some proteins that are crucial for cell proliferation, and it might explain the anticarcinogenic effect of genistein.

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까치버섯에서 추출한 Polyzellin(PM1)의 암예방 활성

김정현*, 이정순, 김우근, 송경식¹, 김영균², 권정숙³, 김정상

경북대학교 동물공학과, ¹경북대학교 농화학과, ²국민대학교 임산공학과, ³안동대학교 식품영양학과

까치버섯은 항산화 효과와 항치매 효과가 보고되었으며, 그 성분이 polyzellin(PM1)으로 밝혀졌다. 그러나 까치버섯의 항암 활성 및 약리 작용에 대한 기전은 아직 명확히 밝혀진 바 없다. 따라서 본인들은 PM1이 항암 지표 효소인 quinone reductase의 활성을 조절하는지 여부를 평가하였다. 즉, murine hepatoma cell(hepalc1c7)과 그것의 mutant type인 Arnt가 결실된 세포(BPrc1)에서 PM1의 quinone reductase 유도 활성을 측정하였다. 두 가지 세포 모델계에서 quinone reductase의 활성은 농도 의존적으로 증가하였다. Western blot 결과 QR 효소 활성 증가는 효소 단백질 함량의 증가에 기인한 것으로 나타났다. 또한, PM1이 hepalc1c7 cell과 BPrc1 cell에서 glutathione-S-transferase의 활성과 glutathione 함량에 미치는 영향을 평가하였다. 결론적으로, 까치버섯에 존재하는 PM1은 암예방 활성이 있을 것으로 예상된다.