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Impact of quercetin, diallyl disulfide and nimbolide on the regulation of nuclear factor kappa B expression in prostate and breast cancer cell lines

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Abstract

NFkB is a key regulator of genes involved in cell activation and proliferation. Activation of NFkB has been implicated in prostate and breast cancer development and growth. Quercetin, a flavonoid from onion, diallyl disulfide (DADS) an organsulfur compound from garlic and nimbolide, a tetra nortriterpenoid from neem leaf have been shown to anticancer activities in various cancers. All the above compounds decreased the prostate and breast cancer cell viability. The IC-50 value of PC-3 cells of Quercetin was 100µM;DADS was 40µM for 24h; IC-50 value of breast cancer cells such as MCF-7, MDA-MB-231 cells were 4µM/ml and 6µM/ml, respectively. Therefore, for further studies 50 and 100µM quercetin, 20 and 40µM DADS, were selected for prostate cancer treatment. 2 and 4µM/ml nimbolide concentrations for MCF-7 cells and 4 and 6µM/ml for MDA-MB-231 breast cancer cells were considered for further study. PC-3 cells were treated with quercetin/DADS, MCF-7/MDA-MB-231 cells were treated with nimbolide.NFkB protein expression was studied by western blot. Protein expressions of IKKαand IKKβwere also studied on DADS treated PC-3 cell line and nimbolide treated both breast cancer cell lines by western blot. Quercetin/DADS decreased the expression of NFkB on PC-3 cells. DADS significantly decreased IKKα, IKKβ and NFkB expressions on PC-3 cells. Nimbolide also significantly decreased the protein expressions of IKKα, IKKβ and NFkB in both breast cancer cell lines. Therefore, the present investigation showed down regulation of nuclear factor kappa B factor expression in androgen independent prostate cancer cells by quercetin or DADS. Nimbolide also did the same on estrogen positive and negative breast cancer cell lines. The data will be discussed with Akt and MAPK signaling regulation on prostate and breast cancer cell lines

Biography

J.Arunakaran, Faculty, Department of Endocrinology, Post Graduate Institute of Basic Medical sciences, University of Madras, Taramani, Chennai 600 113, born in India received ph.D in Endocrinology, University of Madras, 1986. The Major thrust areas are Oncological Endocrinology, Environmental Endocrinology and Neuroendocrinology.

1. Oncological Endocrinology: the role of dietary compounds like quercetin, diallyldisulfide, lycopene on prostate cancer; the role of nimbolide on prostate and breast cancer.
2. Environmental Endocrinology: PCB induced disruption of pituitary testicular axis, generation of ROS particularly in rat testicular Leydig and Sertoli cellular genes regulation leading to functional abnormalities, phthalate induced disruption on Leydig and Sertoli cellular gene regulation.
3. Neuroendocrinology – PCB induced disruption on selected brain regions; neuroprotective role of quercetin and melatonin, Impact of quercetin on tight junctional proteins and specific signaling molecules in hippocampus, cerebellum and cerebral cortex in PCB induced animals.

He has been awarded MRE as a young scientist award by SRBCE in 1995. He has published more than 105 research papers in international and national journals of repute with good impact factors and published four book articles. He is an active member in some of the prestigious societies: Life Member in SRBCE, Treasurer in SRBCE, Life member in Society of Andorlogy (India), IABMS (India), American Diabetes Association, New York Academy of sciences, Endocrine society of India, Indian National Science congress etc., He is handling research projects funded by UGC, CSIR, DST, DBT, UPE, etc., He is guiding PG, M.Phil and Ph.D students. So far, he guided 10 Ph.D students, 40 M.Phil students and 20 M.Sc students. At present he is guiding seven students for Ph.D, 2 students for M.Phil, 3 students 10, 40 M.Phil students and 20 M.Sc students. At present he is guiding seven students for Ph.D, 2 students for M.Phil, 3 students for M.Sc programme.