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Snake venoms causing apoptosis by increasing the reactive oxygen species in colorectal and breast cancer cell lines

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Snake venom possesses various kinds of proteins and neuro-toxic polypeptides which can negatively interfere with the neurotransmitter signaling cascade. This phenomenon occurs mainly due to the blocking of ion channels in the body system. Envenomation prevents or severely interrupts nerve impulses from being transmitted, inhibition of ATP synthesis and proper functioning of the cardiac muscles. However, there are also positive aspects of snake venom use which include anti-cancer properties in prostate and breast cancers as well as in leukemia. Reduced disintegrin function diminishes cell motility and cell invasion in malignant tumor cells. In this study, we examined the effect of venoms obtained from the snakes found in the Kingdom of Saudi Arabia on the phenotypic changes and characterized the changes at the molecular levels using colorectal and breast cancer cell lines. A reduction of 60-90% in cell motility, colony formation and cell invasion when these cell lines were treated with different concentrations of snake venom was observed. Additionally, increase in oxidative stress which results in an increase in the number of apoptotic cancer cells was significantly higher in the venom treated cell lines. Further analysis shows that there was a decrease in the expression of pro-inflammatory cytokines (IL-8 and IL-6) and signaling proteins RhoC and Erk1/2 strongly suggesting a promising role for snake venoms against breast and colorectal cancer cell progression. In conclusion, the snake venoms used in this study showed significant anti-cancer properties against colorectal (HCT-8) and breast (MDA-MB-231) cancer cell lines.

Biography

Abdulrahman Al-Asmari has completed his PhD in Biochemistry from London, UK. He is the Director of Skin Care Research Center, Riyadh, Saudi Arabia. He has published more than 70 papers in reputed journals and has been serving as an Editorial Board Member. He is associated with several ongoing projects on genetic basis of diseases in Saudis.

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