

MULTIFACETED IMMUNOTHERAPEUTIC EFFECTS OF VITAMIN D-BINDING PROTEIN-DERIVED

MACROPHAGE ACTIVATING FACTOR (GcMAF) ON HUMAN BREAST CANCER CELLS

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INTRODUCTION

- Breast cancer is the most common type of cancer in women and one of the most common causes of cancer death.
- This leads to the continuous search for additional therapies that could be used as a complement to or alternative to surgery, radiation therapy and conventional chemotherapy.
- Among these novel approaches, those that target the immune system (often referred to as immunotherapy) and tumour-induced angiogenesis, appear promising.
- Vitamin D-binding protein-derived macrophage-activating factor (DBP-MAF, also known as GcMAF) is a good candidate for both immunotherapy and antiangiogenic therapy since it stimulate macrophages, and inhibits angiogenesis.
- The impressive results of GcMAF on 16 non-anemic women who received weekly administration of GcMAF as treatment for metastatic breast cancer were recently described.

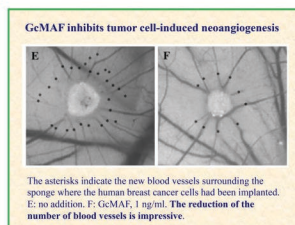
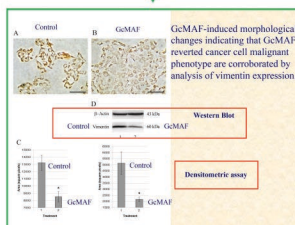
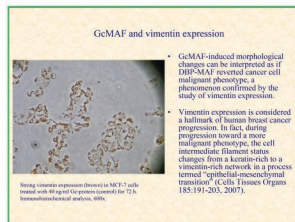
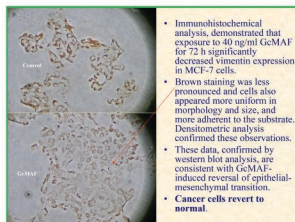
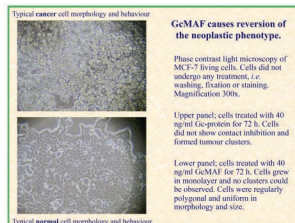
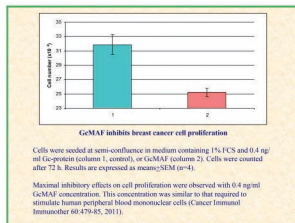
MATERIALS and METHODS

- Here we describe the effects of GcMAF (First Immune GcMAF by Immuo Biotech Ltd) on human breast cancer cells (MCF7 by HPA Culture Collection).
- Proliferation, morphology, vimentin expression and angiogenesis were studied by cell proliferation assay, phase-contrast microscopy, immunohistochemistry and western blotting.
- The effect of GcMAF on tumor-induced angiogenesis was studied by chorioallantoic membrane (CAM) assay.
- The effects of GcMAF in activating tumoricidal macrophages was studied by time-lapse microphotography (NCH Debut capture software).

CONCLUSIONS

- The biological effects of GcMAF were first described in 1994 and shortly afterward its anti/tumour properties in BALB/c mice bearing Ehrlich ascites tumour were described.
- Further studies on the effects of GcMAF on cancer patients reported successful immunotherapy of prostate cancer, and metastatic breast and colon cancer.
- Here we demonstrate that the anti/cancer efficacy of GcMAF can be ascribed at least to three biological properties of the molecule:
 - activation of tumoricidal macrophages
 - inhibition of tumour-induced angiogenesis
 - direct inhibition of cancer cell proliferation, migration and metastatic potential.
- Our results support and reinforce the hypothesis that GcMAF is a molecule endowed with multiple biological activities underlying its powerful anti/cancer properties.
- It is auspicious that GcMAF might soon enter therapeutic protocols for the immunotherapy of human cancer.

EXPERIMENTAL RESULTS



The following pictures from a video show activated macrophages "attacking" and destroying a culture of human breast cancer cells.

In the sequence of pictures it can be observed that the irregular growth of the breast carcinoma cells is arrested and the large cell biomass is reduced and carcinoma cells destroyed by ingestion by the GcMAF-activated macrophages.

Inhibition of tumour angiogenesis

deprives cancer cells of their energy/blood supply and re-directs energy/blood supply to normal tissues fighting cancer cells.

Starved and weakened cancer cells thus become easy prey of tumoricidal macrophages activated by GcMAF.

