

## ***Role Fasting In Metabolism And Tumor Progressive***

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### **ABSTRACT**

**Background:** Fasting is the voluntary abstinence from food and drink for a fixed period of time while remaining faithful to certain rules. Fasting has been practiced by humans since ancient time. Fasting involved in the regulation of many metabolic processes correlated with transitioning into a process capable of Energy production and carbon-based metabolism mainly from Tissue adipose and muscular parts. The differences in the levels in the blood hormones and metabolites help to lower and eventually defend normal cells from chemical insults in the cell division and metabolic activity. Fasting Can induce an anti-warburg response by reducing glucose absorption Carriers (GLUTs) and aerobic glycolysis and force cancer cells to Improve in oxidative phosphorylation (OxPhos); It improves efficiency in cancer cells and, subsequently, toxic products of reactive oxygen (ROS). DNA, p53, DNA damage , and death of the cells , particularly Chemotherapy response, Fasting serves as improving anti-tumour immunity By Fasting or FMD.

**Conclusion** Fasting regulates many physiological functions associated with transitioning into a process capable of producing energy and carbon-based metabolic activity mainly from adipose and muscular tissue., The fasting action is largely dictated by the levels of glucose, glucagon, insulin, GH, IGF1, and adrenaline in the blood., Some many discrepancy in the rates at which hormones and metabolites circulate are normally found during fasting, allowing antitumor response . ,fasting reaction Protects significant nerves and glia but still doesn't prevent glioma or neuroblastoma, Cyclophosphamide, and pro-oxidant Compounds, and preserves the embryonic mouse Doxorubicine fibroblasts.

**Keywords:** FASTING, IGF1, FMD, IGFBP1, GH.

### **Article Information**

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## **INTRODUCTION**

Fasting is the ability of food abstinence and all drinks to follow such laws for a period of time. earlier people's primary target is food, but even today 's behaviors play an important role. Fasting is carried out as an acknowledgement to God in the creation of mankind. Fasting has always been about purifying the brain and soul, A fasting and dietary restriction play an significant role in medicine The holy month of Ramadan is referred to as a religious month of the Islam and number of days that will be fasted this month is also specified (1).

### **Role of fasting in metabolism**

Fasting involved in the regulation of many metabolic processes correlated with transitioning into a process capable of Energy production and carbon-based metabolism mainly from Tissue adipose and muscular parts. The differences in the levels in the blood hormones and metabolites help to lower and

eventually defend normal cells from chemical insults in the cell division and metabolic activity. (2,3) A fasting response is determined mainly by the circulating level of glucose, glucagon, insulin ,GH, IGF1 and adrenaline. In the first step of post-absorption, which normally takes 6 to 24 hours, the level of insulin is decreasing, and glucagon is going to

rise, which helps to disintegrate the storage of glycogen in liver (which was reduced in approximately 24 hours). Glucagon and low insulin levels also promote glycerol degradation and free fatty acids from triglycerides. Using energy from fatty acids, while brain depends on glucose and hepatocyte-generated ketone (Ketones can be derived from acetyl-CoA or ketogenic amino acids of fatty acid  $\beta$ -oxidation). Ketone bodies achieve millimolar levels in the ketogenic fasting process, usually starting two or three days after the beginning of the fasting. Ketone bodies support gluconeogenesis with a rate of glucose of approx. 4 mm (70 mg per dl). Glucocorticoids & adrenaline are both effective in controlling fasting, blood sugar maintenance and lipolysis stimulation (4,5). Especially at fasting may improve GH levels at least temporarily (Gluconeogenesis and lipolysis increased while systemic consumption of glucose decreased). Fasting lowers IGF1, and under fasting conditions the biological properties of IGF1 are partially restricted by increasing insulin-like growth factor binding protein 1 (IGFBP1), binding to IGF1 in blood and effecting its interaction on cell surface with the associated receptor IGF1. (6). Eventually, fasting decreases accumulating leptin, a mainly appetite generated by adipocyte, while increasing the levels of adiponectin, which raises the fatty acid breakdown (7).

Systemic mammalian fasting response is characterized by Strong glucagon and ketone concentrations, lower levels of IGF1 and leptin and relatively high levels of adiponectin, normal cells response to fasting is conserved evolutionarily and provides cell defense, and it has been shown to increase lifespan and health span, at least in model organisms. (8,9)

The IGF1 cascade signaling is a critical route for the modulation of the cell-level rapid results. Protein intake and increased levels of amino acids raise the levels of IGF1 under normal diet and improve protein Synthesis, stimulating AKT and mTOR action. Vice versa, IGF1 levels and downstream signal degradation during fasting, decreasing AKT mammalian inhibition FOXO transcription factors that improve gene transcription, Stimulation of enzymes including certain haem

oxygenase 1 (HO1), dismutase superoxides (SOD), catalase antioxidants, and defense responses (10,11).

Large levels of glucose promote the signaling of the protein kinase A (PKA), negative effects on Master AMP-activated protein kinase energy sensor (AMPK) in order to inhibit stress resistance transcription factor expression of early growth response protein (EGR1) (12,13.) The fasting and glucose-restricting effects inhibit PKA function, raise AMPK operation, and trigger EGR1 and achieve cell defense results, including myocardial results (14,15).

Fasting and FMDs are also capable of inducing Molecular mechanisms (BOX 1) which are mainly concerned with cancer like enhanced autophagy or sirtuin development Renewable effects (16,17) .

### **The relationship of fasting, hormones, tumors, and metabolism**

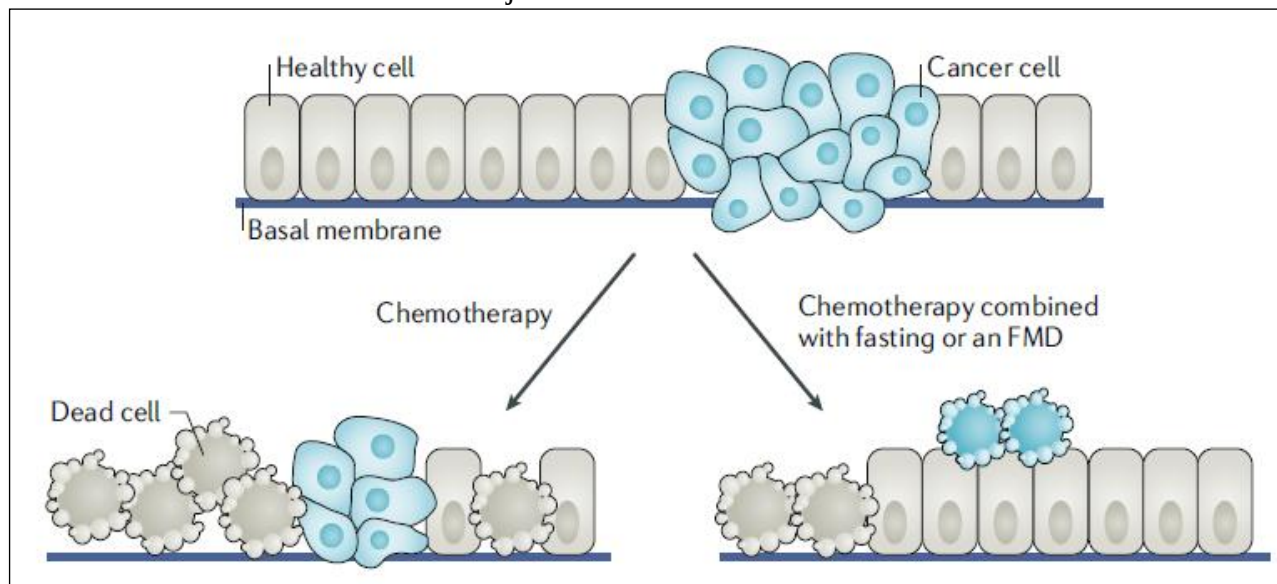
Several differences in the rates of Hormones and Metabolites circulate are usually found during fasting able to practise antitumor Response (– i.e., decreased glucose rates, IGF1, insulin and leptin, and Adiponectin-levels)(18,19,20) And / or require to Good tissues safety From side effects (that really is, linked to lower of IGF1 and glucose levels).

Since ketone bodies may induce histone inhibition ,Fasting- mediated deacetylases (HDACs) Rising ketone bodies may help delay Development of tumors and supporting separation through epigenetic pathways (21). Nevertheless, the acetoacetate ketone body was Shown to increase rather than., Growth in other tumor cells, including such Melanoma in BRAF mutation (22) all that will Increases for which the best is Proof of position in beneficial results reductions in IGF1 and glucose levels are among fasting and FMDs against cancer.

Fasting at the cellular stage with an FMD Helps to reduce intracellular cascade signaling IGF1R – AKT – mTOR – S6 K incl. CAMP – PKA signalling, Autophagy increases, Helps human cells tolerate and avoid tension Promotes tolerance to cancer.(23,24,25). Subsequent experiments reported a decrease in IGF1 signalling fasting reaction Protects significant nerves and glia but still doesn't prevent glioma or neuroblastoma,

Cyclophosphamide, and pro-oxidant Compounds, and preserves the embryonic mouse Doxorubicine fibroblasts (26). EGR1 also promotes the value of the preclinical findings fasting and chemotherapy improve FMD Tolerance and to eliminate major side

effects. Since original clinical results include important assistance support these preclinical opportunities Studies provide a good argument for appraisal FMDs in controlled scientific trials TEAE is the key source of information.



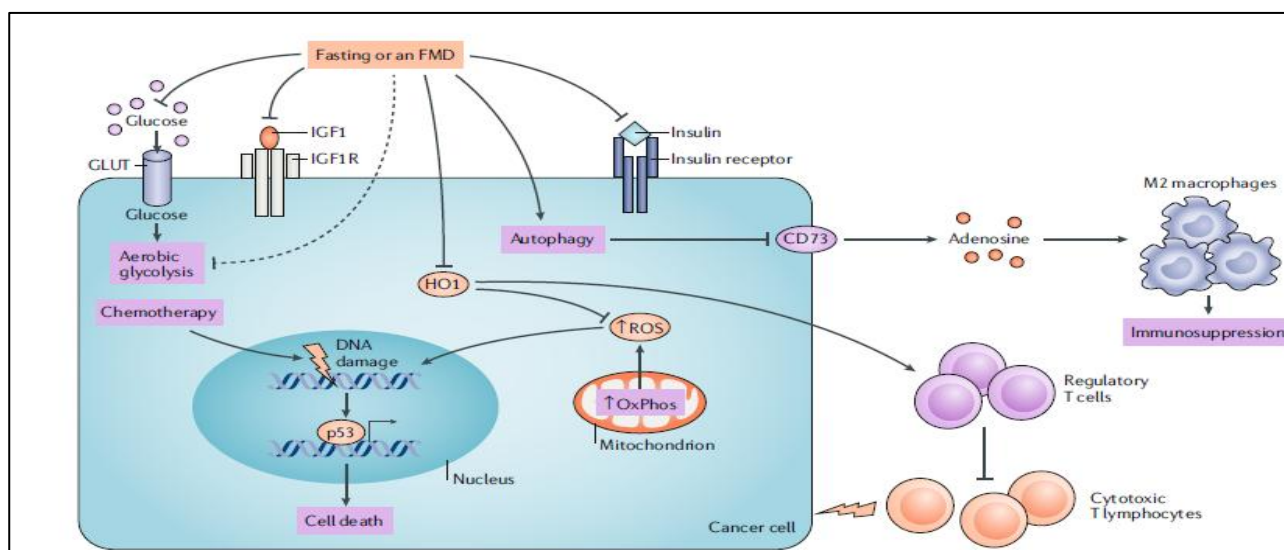
**Fig. 1 : Resistance to differential stress vs susceptibility to differential stress.**

Chemotherapeutics acting Induce tumor shrinkage In all human and cancer cells, while still triggering almost certainly Side effects which can be serious and sometimes life threatening due to multiple epithelial injury and Non-epithelial cells. Depending on the preclinical evidence accessible, fasting or a vegetarian diet (FMD) may be helpful in distinguishing chemotherapy results, and probably new cancer medications, On human cells and cancerous cells. Because of the oncogenic mutations which constitutively occur Trigger growth-stimulating signaling cascades, and cancer cells struggle to respond adequately to appetite. As a consequence, several forms, though not common, of cancer cells (27).

#### **Fasting or FMD-dependent cancer cell killing in solid tumors**

Fasting Can induce an anti-warburg response by reducing glucose absorption Carriers (GLUTs) and aerobic glycolysis and force cancer cells to Improve in oxidative phosphorylation (OxPhos); It improves efficiency in cancer cells and, subsequently, toxic products of reactive oxygen (ROS). DNA, p53, DNA damage , and death of the cells , particularly Chemotherapy response. Autophagy may be allowed to minimize fasting CD73 levels in certain cancer cells thus blunt the development of adenosine in Extracellular and macrophage change avoidance climate towards a form of immunosuppression M2.

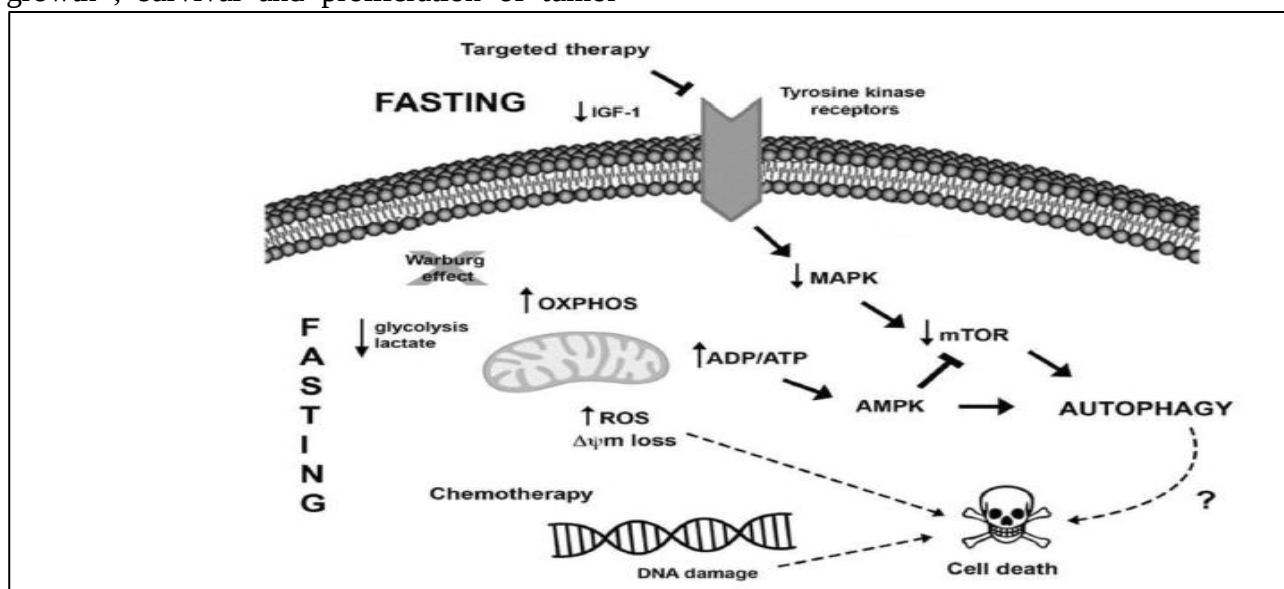
Fasting or FMD may eventually downregulate the haem oxygenase1 (HO1), of Breast cancer cell development that makes CD8 + cytotoxic T cells more effective, perhaps by by Countering Regulation T (Treg) cells' immunosuppressive influence In specific, Fasting or an FMD also have very various impacts in Multiple kinds of cancer cells, or also even in the same group of cancer cells. Fasting serves as improving anti-tumour immunity By Fasting or FMD (fig;2). Latest statistics indicate That Fasting or FMD alone, and In greater measure when paired with Chemotherapy, extension cause Progenitors of lymphoids and encourages Immune attack by tumor via various Mechanisms (28,39,30).



**Fig(2):Preclinical and early clinical data suggests that fasting or semi fasting diets suppress tumor growth promoters. (31)**

The effect of Warburg (glucose breakdown by glycolysis even when oxygen present) can be reversed by fasting, which promotes oxidative phosphorylation in tumor cells and improve the ROS development and lower lactate levels; The ADP / ATP ratio improvement can cause an AMPK movement, leading to the activation of autophagy In turn, the Cell death induction may result in a prolonged stressful situation, Several MAPK mutations are found in many tumours. Hyperactivation that allows the growth , survival and proliferation of tumor

cells. Therapies targeted at this approach and fasting can be used. result in autophagy induction and downregulation of this route alongside a reduction in AKT and mTOR activation.and Death of the cell. (fig;3) . In fact, fasting also causes chemical therapy effects such as DNA damage and thereby activates the cell. death system, deregulation and activation of mitochondrial and caspase activities for pro- and antiapoptotic proteins In turn, apoptosis culminates (33).



**Fig(3) Presumable major mechanism for the production of intracellular changes caused by fasting and anticancer therapy and Tumor cell autophagy induction(34).**

## CONCLUSION

1. 1-Fasting regulates many physiological functions associated with transitioning into a process capable of producing

energy and carbon-based metabolic activity mainly from adipose and muscular tissue.

2. The fasting action is largely dictated by the levels of glucose, glucagon, insulin, GH, IGF1, and adrenaline in the blood.
3. Some many discrepancy in the rates at which hormones and metabolites circulate are normally found during fasting, allowing antitumor response .
4. fasting reaction Protects significant nerves and glia but still doesn't prevent glioma or neuroblastoma,

## RECOMMENDATIONS

Fasting is recommended for people who have hormones and weight problems , fasting can act as a CO-helper for tumors chemotherapy accumulation.

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5. Fasting and FMDs can also stimulate Molecular mechanisms (BOX 1) that are primarily concerned with cancer, such as increased autophagy or sirtuin development. Effects of renewable resources.

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NONE

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