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The Glutathione Cycle is the Creative Reaction of Life and Cancer. Cancer Causes Oncogenes and not Vice Versa

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Abstract—Life is definable as a chemical reaction which obeys exponential growth and dies if reversed. Such a reaction must be the commencement of all life so that every evolved form of it inherits these characteristics. As no single reaction known has these two features, life must be a combination of two or more reactions which whilst obeying all the classical laws of physics and chemistry assume an exponential form and effectively act as being irreversible. The reactions of glutathione—oxidation and reduction—when combined in sequence as a cyclical process fulfill these criteria. The cyclic changes of glutathione from reduced to oxidised to reduced forms must therefore be the reaction which creates life and is responsible for cancer's growth. 434 mHz electromagnetic radiation stimulates cancer growth rate by forcing this cycle into activity. Proof of this hypothesis is the long-term control of cancer in 11 patients treated with oxidised glutathione and 434 mHz radiation. Genetic material does not contain any energy system with exponential form, neither is it self-replicating. Genetic material will only reproduce if placed within an immortal cell in which all controls of the glutathione system have been lost, as in a cancer cell. Oncogenes must be the product of cancer and not the reverse.

Introduction

All life is an interwoven series of chemical reactions which obey the laws of Conservation of Mass, Constant Composition, Multiple Proportions Reciprocal Proportions, Combining Weights, etc and of Thermodynamics. The chemical reactions which create life whilst individually conforming to these criteria must be so arranged that they also obey the two laws of properties fundamental to all life itself. These unique laws of life are 1) exponential growth and 2) irreversibility.

Evolution has produced multiple complex life forms. If the evolutionary ladder of every form of life is retraced so that life's origins are uncovered, then that origin must have been a chemical reaction which grew or created energy in exponential amounts proportional to time.

All life forms die if any or all of their chemical reactions are reversed. In contrast every inanimate reaction can be reversed, however complex that reversal may be, with the substrates re-used repeatedly for the original reaction. Every known inanimate reaction is both reversible and obeys non-exponential behaviour.

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The start of life must therefore be some combination of two or more conventional reactions which produce the effects of irreversible and exponential growth, designated R_{exp}. The oxidation and reduction reactions of glutathione provide a system which fulfills these characteristics. When reduced glutathione (GSH) is converted to oxidised glutathione (GSSG) two electrons are released. When GSSG is reduced to GSH only one electron is absorbed (1). Considered as a cyclic reaction, GSH—GSSG—GSH, each cycle will produce an electron of energy which will power a further cycle. If this proceeds unhindered the result is the production of exponential quantities of energy in proportion to time. Hopkins (2) has shown that GSH is essential for a proportion of anaerobic glycolysis in embryonic cells and that all living cells contain some GSH and/or GSSG. This suggests that the energy driving R_{exp} and maintaining the GSH/GSSG cycle is derived from anaerobic glycolysis. When life commenced the world was very radio-active and R_{exp} could have been energised by Beta particles, in which case the cycle would obey true exponentiality and $E_T = E_O e^{AT}$, where E_T electrons would be generated from E_O electrons in time T at a rate A.

Since this system has only two components—GSH and GSSG— which interchange their physical states to create a cycle, then the effect is to automatically create the equivalent of irreversibility.

Clinical evidence that the GSH—GSSG cycle is active in cancer

3 patients were treated with an oxidising agent which prevents the reduction of GSSG to GSH and thus presumably immobilises the R_{exp} cycle. Intravenous infusions of 10 ml of tertiary Butyl Hydroperoxide in 300ml of normal saline in 1 h followed by 434 mHz (Ultra high frequency or UHF) therapy for 10 min on two occasions 30 min apart (3) was given. It was repeated for a maximum of 25 treatments spread over 3 months. 2 patients suffering from thoracic mesothelioma (NK, DoB 26/2/29 and DJP, DoB 26/11/42) referred after failure of various conventional methods were treated in 1984. Both obtained complete remissions and were asymptomatic for more than 5 years. NK died after a coronary bypass operation in 1990 and DJP developed metastases in untreated areas and died after a course of cytotoxics in another institution. GP (DoB 15/7/18) was treated after a gastro-enterostomy and a choledocho-enterostomy for an inoperable cancer of the pancreas between December 1984 and April 1985. 6 years later he remains well, clinically normal and his X-rays show no evidence of disease.

Hypoglycaemia will also selectively kill cancer (4) and must therefore be presumed to block R_{exp} or interfere with cancer's energy source but cannot be used to prove that the energy source is derived from GSH/GSSG. Repeated measurements of the blood glucose levels of these 3 patients during their treatments were all normal, thus excluding hypoglycaemia as a cause of their long-term cancer control.

Cancer therapy with combined GSSG and UHF in 11 patients

11 patients were treated with intravenous injections of 1g of GSSG followed immediately with UHF therapy to their cancer bearing areas, two to five times weekly for 12–15 treatments. 10 patients had already received extensive conventional therapy and all presented with biopsy proven life threatening cancer recurrences. All 11 survive, 9 are free of cancer more than 5 years later. (For details see appendix.)

1 patient (PF, male, 45 years, suffering from a recurrence of a psoas muscle fibrosarcoma after incomplete excision 6 months earlier) was treated using 1.5g of GSH instead of GSSG and an increase in the growth rate of his cancer was noted. This phenomenon has been reported earlier (5) and is pictured in Figures 1 and 2. After 3 treatments it was clinically obvious and the GSH was combined with t-Butyl hydroperoxide as in the previous regime. This caused an immediate cessation of the cancer's growth. After a further 6 treatments in like manner he obtained a good response, but 6 months later a small residual mass persisted which was excised and 6 years later he is disease free. All patients have been seen regularly and no complications or sequelae are present today. A dose of GSSG exceeding 1 g per 70 kg body weight may cause an epileptiform seizure which can be immediately relieved by an injection of GSH. No side effects of GSH have occurred and doses of 5 g are tolerated.

Cancer lacks the features of a genetic disease

The biopsy shown in Figure 1 was from a 2 cm diameter breast cancer in a woman of 67 years who said that it had taken 2 years to double in size. Treatment with combined UHF and X-ray therapy produced a complete control of her cancer and she is alive 14 years later, disease free. Immediately after her first UHF therapy (5 min exposure in the near field of 4 434 mHz antennae energised at 1 Kw each, approximately 20 mw/sq cm) she was re-biopsied. This is displayed in Figure 2. These two biopsies were submitted to 5 different histo-pathologists, without the above clinical details, and all 5 reported that the specimens were from unrelated patients! UHF has altered the microscopic appearance so grossly that one cancer has

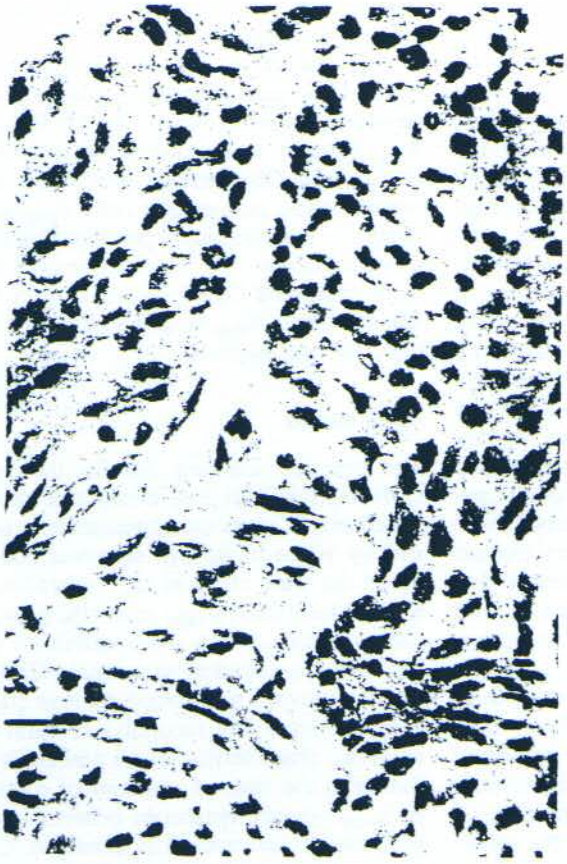

Fig. 1 A biopsy of a slowly growing breast cancer. No prior treatment, a 2 year history.

Fig. 2 A biopsy of the same cancer, same site, immediately after exposure to UHF, 6mm at 20 mw/sq cm.

changed into a different one. This variability in appearance is absolutely contrary to that of a genetically controlled situation. Cats, dogs, horses, elephants and roses etc, maintain their specific characteristics under similar conditions. Neither intense UHF radiation of any frequency or any other electromagnetic radiation has ever been shown to cause mutations, although ionising radiation may have such properties. If cancer was genetically controlled it would be expected that the same effects of non-ionising radiation on cancer as reported here would cause changes in all living genetic control with widespread alterations in all living forms. This change of genetic form would only have occurred since 1900 when radio-wave pollution started. Elwood and Lee (6) showed conclusively that a 'factor which raised the melanoma mortality rate in the northern hemisphere was inactive in those born before 1903 and fully active in those born after 1923'. What other physical change came into the northern hemisphere then except Marconi and his radio-wave pollution? In western Australia the statistics of mortality of chronic myeloid leukaemia reveal that between 1951 and 1959 90% survival at 40 months deteriorated to 18% between 1964 and 1967 (7, 8). Prior to 1959 western Australia had no TV, radars, 27 mHz citizen band, etc causing electromagnetic pollution and only a few low powered medium wave radio stations. 1960 saw 3 high powered (9 kw) TV transmitters commissioned, radiating 90% of the population. One station broadcast 24 hours daily. These facts support the hypothesis that cancer can be influenced by factors which do not influence genetically controlled situations.

A gene is defined (McQuarie Dictionary) 'as a unit of inheritance which is situated on and transmitted by the chromosome and which develops into an hereditary character...'. It follows that if each cancer grew and developed with an hereditary character then each

histo-pathologist would always agree with every other opinion. Seven histo-pathologists, with back-up from five major overseas cancer centres, formed the diagnostic panel of the Leukaemia and Allied Diseases Committee of the Western Australian Cancer Council. They attempted to classify 160 patients suffering from Hodgkin's Disease, diagnosed clinically. They reported 136 suffered some variant of the disease, in 7 the diagnosis was probable, in 1 it was possible, in 10 each expert differed and the diagnosis was made by exclusion, 5 were only diagnosed at autopsy and the final case was accepted by assuming a co-existant leukaemia distorted the diagnosis! Only 3 pathologists unanimously agreed on 44 of the biopsies, there being lesser agreement on the other 116 patients. This series reveals a complete lack of any uniformity of Hodgkin's Disease and demonstrates absence of any 'Hereditary Character'. All other cancers are also similarly pleomorphic. The only cancer which has the characteristics of an hereditary disease is retinoblastoma and proof that this cancer is due to genetic causes is not yet available. The inherited abnormality may arise from cytoplasmic structures, not genes.

Genes and chromosomes are not self-replicating. They divide when their host cell divides. Every item of chromosomal and/or genetic research or engineering of genetic products is carried out by using immortal cells created from normal cells by carcinogens or cultured from cancers. The immortality of the carrying cell is due to its autonomous growth which occurs when R_{exp} is uncontrolled. No evidence exists to suggest that chromosomes or genes contain R_{exp} which alone has the same distinguishing unique features as life. Neither exhibit exponential growth in isolation and neither contain GSH and/or GSSG. Indeed Stern (9) has shown that the nucleus is always anoxic, even when the nuclear membrane is incomplete. It seems unlikely that GSSG could exist in any nuclear environment.

Discussion

X-ray therapy (XRT) alone kills cancer in quantities exponentially related to the dose delivered (10). Because cancer grows at an exponential rate (11) due to energy supplied by the reaction R_{exp} (the GSH/GSSG cycle) then the primary target of XRT must be R_{exp}. Also, because UHF (434 mHz EM radiation) increases the rate of kill of XRT whilst maintaining its true exponential form it automatically follows that the primary target of UHF must also be R_{exp} (12). The deposition of energy from UHF in R_{exp} would explain the stimulant effect it has on cancer. Figures 1 and 2, Elwood and Lee's findings, the doubling of Queensland's melanoma death rate and Woodliffe and Dougan's analysis of deaths from myeloid leukaemia in west Australia (5–8). This also is the rationale of the therapy used in treating cancer with GSSG and oxidising agents followed by UHF. UHF forces all R_{exp} systems to become active yet in the presence of oxidised GSH energy production is blocked. In normal stable non-mitotic cells R_{exp} is in controlled inactivity until mitosis is permitted by the bodies control mechanism (13). The only normal cells in danger from combined GSSG and UHF appear to be those few in which R_{exp} is active for their mitosis when the UHF was applied.

Conclusions

The reaction creating life is the cyclic one of GSH–GSSG–GSH etc, because it produces energy (electrons) in exponential quantities in relation to time and by virtue of its two substrate composition produces the same effect as an irreversible one. This reaction (designated R_{exp}) must also provide energy for cancer mitosis, which when stimulated with 434 mHz UHF and then blocked by oxidised GSH can be selectively destroyed with long-term host survival. Cancer does not have any recognisable form which is the universal characteristic of all genetically created life. Cancer is the state of autonomous mitosis, energised by R_{exp}, whence synchrony between synthesis of cell components and mitosis is deranged. Oncogenes appear as the results of this deranged metabolism and cannot be its cause.

Appendix

Details of 11 patients treated with an intravenous injection of 1g GSSG per 70 kg body weight followed immediately with UHF therapy. The site of the cancer was irradiated with 4 antennae for 2 or 3 applications of 6 min each, with rest periods of 15 min between. Each antenna was energised with a generator supplying up to 1.5 kw of power. 9 patients had proven active cancer (biopsy or operative specimen) just before the treatment. No. 9 refused biopsy or surgery but her advancing ocular melanoma was clinically certain. No. 8 refused a biopsy before his second treatment, $6\frac{1}{2}$ years after his first course for brain cancer.

Abbreviations: F = female, M = male, DoB = date of birth, S = surgery, X = X-ray therapy, R = recurrence, biopsy proven before treatment, T = treatment as above using GSSG and UHF radiation.

1. JD, F, DoB 31/5/46. Glioblastoma grade 3, S & X Dec'83 to Feb'84. R & T Aug'84 & Jan'85. Yearly computerised scanning, all normal with the latest in Jun'90.

2. RH, M, DoB 23/1/39. Non-Hodgkin's Lymphoma involving bilateral neck and axillary nodes and mediastinal disease. X in Jul'83 and Mar'84, R in Nov'84, T in Dec'84 & Jan'85. Complete resolution, clear Jan'91.

3. CM, F, DoB 26/11/59. Fibrosarcoma of the pelvic wall. S in Oct'79 & Oct'81. X in Nov'81. R & T in Feb'85. Now has no evidence of cancer and she is normal on X-ray and clinical examinations, Mar'91.

4. JO'J M, DoB 1/4/55. Inoperable anaplastic carcinoma in groin and retroperitoneal nodes, biopsy only. T in Mar & Apl'80. Free of cancer since, now normal on X-ray and clinical examinations, May'91.

5. AP, F, DoB 6/1/24. Nasopharyngeal carcinoma with bilateral neck metastases in lymph nodes. X in Aug'75, Sep'79, Feb'84 & Apl'84. R & T in Jul'84, now free of cancer, last examined in Mar'90.

6. CP, M, DoB 13/10/38. Nasopharyngeal carcinoma with unilateral neck lymph node metastases. X in Aug'80 & May'84. R & T in Mar'86. Free of cancer, last examined with negative biopsy Jun'91.

7. MR, F, DoB 3/5/30. Bilateral ovarian cystadenocarcinoma. S & X Apl'86. Developed bone and lung metastases. R & T in Jul'86. Complete remission and improvement in her bone scan in Jul'90.

8. JR, M, DoB 5/5/34. Astrocytoma grade 1. Biopsy and T Sep'83. Well for $6\frac{1}{2}$ years, recurrence, refused biopsy, re-treated Apl'91 and he has had a further regression with cessation of Jacksonian seizures.

9. GS, F, DoB 14/1/21. Refused S or biopsy for a progressing retinal malignant melanoma. X in Jan'87 proved ineffective but T in Mar'87 has inactivated the melanoma which is static. No clinical changes observed to have taken place since then Jun'91.

10. AS, F, DoB 1/7/29. S Nov'86, uterine leiomyosarcoma. R & T Dec'86 and Jan'87. X-ray scan and clinical examination normal, Jun'91.

11. MH, F, DoB 25/9/21. Nasopharyngeal carcinoma, bilateral neck node metastases. X Jan'79 & Mar'80. R & T Oct'80. Disease free Oct'90.

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