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AN INTRODUCTION TO PROTOMORPHOLOGY

BY

ROYAL LEE, D. D. S.

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There is probably no recent discovery in the field of biological science which has shown such great promise of prompt and practical therapeutic results as that branch of nutrition now known as protomorphology.

*Introducing a new
biological and
nutritional field
of science.*

In this brief review of the subject we will introduce some of the basic principles of protomorphology and outline the theories that have evolved. In addition we will give some of the latest reports regarding the use of protomorphogens as practical therapeutic entities.

Outline.

Those who are interested in learning more about this subject may obtain on 30 day approval the book, "Protomorphology — The Principles of Cell Auto-Regulation" (\$8.50), from Lee Foundation for Nutritional Research, Milwaukee 3, Wisconsin.

Reference.

Protomorphology, as we know it today, was made possible by the efforts of many early investigators. We must pay tribute here to some

*Early
investigators.*

What Is A Protomorphogen?

A Protomorphogen is that component of the cell chromosome that is responsible for morphogenic determination of cell characteristics. It is the smallest unit of the cell blueprint assembly. It is the smallest unit of the gene system that guides the cell into its hereditary form as it grows, develops or repairs itself. Without sufficient protomorphogen in its chromatin, the cell degenerates, de-differentiates, becomes senile and dies. The protomorphogen level in the cell is regulated by the fact that, while normally more is constantly being created by the cell nucleus, it is antigenic and promotes the formation of antibodies (in the mammalian organism), which in turn control the levels of extracellular protomorphogen in blood and lymph.

Cortisone appears to specifically stimulate the creation of protomorphogen antibody (natural tissue antibody) by its effect of causing flocculation of proteins so that phagocytes can pick up and carry to the reticulo-endothelial system fractions of circulating proteins. Thymus specifically opposes this flocculation by promoting the opposite state of proteins, the colloidal dispersion and depolymerization of such molecular aggregates. (That is why thymus is most active during the development ages, protecting the cells against the growth-inhibiting effect of cortisone.)

Adrenal-cortico-steroids act to release adsorbed stores of antibodies in lymphatic tissue, affording immediate action of such factors in response to stress demands that require a stepping up of metabolic activity. It must be appreciated that the protomorphogen not only is a storehouse of blueprints but also a charged storage-battery type of substance that when

broken down by an antibody releases tremendous amounts of energy, not requiring any combustion for its release (no oxygen). The "second wind" of the athlete is due to stress acting to promote release of this reserve energy. It is probable that when adrenalin releases sugar from phosphagen, it is also releasing this type of energy as well.

The ability of the tissues of the animal (or human) to repair themselves depends not only on the food supply available, but also upon the presence of certain specific growth factors that differ for every organ of the body, and must be derived from the cell nucleus.

Antibodies are formed normally against these specific growth and repair promoting factors (otherwise known as protomorphogens and cytomorphogens, because they determine the form of proteins and cells); this antibody opposition being the normal controlling mechanism against overgrowth of an organ or tissue beyond the needs of the body.

In case of damage to any specific tissue by which unusual amounts of its proteins are released into the blood stream, an excessive antibody reaction seems to occur. An allergy, as it were, may exist against certain cells or tissues.

REFERENCE:

"Protomorphology" by Lee and Hanson, priced at \$8.50. May be obtained from Lee Foundation for Nutritional Research - 2023 West Wisconsin Avenue - Milwaukee 3, Wisconsin.

Additional information available on request.

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Cytotrophic Extracts (Protomorphogens) now available from the Standard Process Laboratories

Cytotrophic Extract of Beef Adrenals	
" "	" Veal Bone
" "	" Beef Brain
" "	" Beef Heart (Cardiotrophin)
" "	" Beef Kidney
" "	" Beef Lung (Pneumotrophin)
" "	" Beef Orchic Substance
" "	" Beef Ovaries
" "	" Beef Pancreas
" "	" Beef Parotid
" "	" Beef Pituitary
" "	" Beef Prostate
" "	" Beef Thymus
" "	" Beef Thyroid
" "	" Beef Uterus

new system of treating chronic disease has resulted. For several years now we have been accumulating clinical data, and our present knowledge is being fortified by the new clinical uses which are constantly being revealed to us. Some of the most important facts in the world were discovered first and explained afterward, the explanation being easy once the facts were known. We realize here that we began with a lot of unexplained facts and then set up a theory. The important thing was that we found that the theory seemed to work whenever it was applied.

As one authority describes it, life is simply "a bundle of enzymes". Protomorphology may be defined as the study of enzymes and their activators. Enzymes are the key to growth and repair, the key to the maintenance of the cell—in fact they are the key to life itself. The word "protomorphogen" is used to express the function that these enzymes are performing. "Mor-phogen" means determiner of form, and proto-morphogens are protein determinants, catalyzers of protein synthesis. Every cell has a number of these protomorphogens because it has just as many as it has kinds of proteins. We also describe a protomorphogen as one of the fractional blueprints of the cell. Protomorphogens are in the nature of nucleo-proteins and are really blueprints of things that are going to be built long before they are built.

DEFINITION:

The study of function of enzymes and their activators.

Protomorphogens are produced by every living cell in the body. The germ cells, the

ORIGIN:

all specifically different. Now when we realize that protomorphogens are the (essential components of this enzymatic-protein construction because they are the determinant factors by which its substance is maintained,) we begin to have some idea of the significance of these growth substances.

Protomorphogens should be considered as non-vitamin food factors because the substances involved are almost all parts of structures of the beef animal and are simply extracts of various tissues and organs that would ordinarily be considered as foods. Since they do not contain hormones, in one sense they are simply meat juices, nutritionally speaking. The factors which are involved have always been present (like vitamins and enzymes and organically combined minerals) but remained heretofore unknown and unsuspected components of the human food pattern.

**BIOLOGICAL
CATEGORY:**
*Non-vitamin
food factors.*

The single cells of every organ in the body have their own specific types of these cell determinants which carry the blueprints of the whole organ. To understand the general mechanism of protomorphogen control, it is first necessary to go back to the single cell and its anatomy. We know that the cell builds and repairs itself by first secreting into the surrounding media the enzymes and determinants (protomorphogens) that promote the formation of a layer of protein molecules on the outer cell wall. Then the wall is rebuilt outside this protein layer, and the process is repeated.

FUNCTION:
*Organization of
protein construction
in pericellular
fluids.*

Note: The new protein must be built outside the cell from materials in the surrounding media and, to build the special proteins, the cell must be provided by some means with the blueprints to guide the required construction. This guidance of construction is accomplished by an aggregate of enzymes and trace mineral factors that are more highly organized than any watch. (This is the function of protomorphogens)

**CONTROL
OF GROWTH:**

*Continuous growth
and repair of
tissues shown.*

It has been demonstrated that you can put a fragment of liver tissue into a flask and, by changing the culture medium every day to get rid of the toxic material (a specialized form of blood serum), these liver cells continue to grow and you have to cut a piece off every day or two to keep from filling the flask. You will probably recall Dr. Carrell's famous chicken heart fragment which grew for 35 years until they tired of taking care of it. (These experiments prove that repair will continue as long as the proper environment for tissue is maintained.)

**TISSUE
DETERMINATION:**

*The nature of
tissue controlled
by protomorphogens.*

It has also been demonstrated that one kind of cell may be reconstructed to become another kind of cell. For instance, you can culture some liver cells in a flask and put some connective tissue from kidney in with it and soon you will have kidney cells instead of liver cells. This is because connective tissue has a special affinity for protomorphogens and, by changing the concentration of the blueprint material in the culture medium, the basic tissue will follow the pattern being set up by the

blueprint material. In the same way, if you graft a piece of skin from outside the body into the mucous membrane of the mouth, in a few weeks it will become mucous membrane. The epithelial cells of the skin take in the blueprints of the mucous membrane and gradually convert the skin cells to mucous membrane cells. An experiment of this kind was made by grafting a piece of embryo calf skin into the belly of a guinea pig. In a few months the calf skin was growing guinea pig hair instead of calf hair. These experiments show that the protomorphogens find their way into the culture medium and direct the growth processes of any appropriate cells which may be present.

Now I would like to go into the work of Dr. Robertson. He wrote a textbook in 1923. He was the first man to discover the growth factor of the pituitary gland. He also showed that certain growth factors could be separated from every living cell, from yeast cells for example, and that these cell extracts would stimulate growth when supplied to a culture medium; also, he showed that if these cell extracts were supplied in increasing amounts they would inhibit growth instead of stimulating it. It was the degree of concentration of the substance in the medium that was significant and growth was thereby regulated. Apparently there were three primary phases: in a very dilute concentration the growth rate was relatively slow; in an optimum or medium concentration there was accelerated growth; and

GROWTH CYCLE:
*Growth rate
predictable;
S-curve
characteristic.*

you get burned very severely, the adrenals will be damaged. It has been said that patients who die from generalized burns do not die from the burns themselves, but they die from adrenal destruction. Vitamin support of the adrenals—C and G complexes, as well as adrenal protomorphogen extracts—often produce remarkable re-establishment of adrenal function, which to my knowledge can not be obtained in any other way, hormonal therapy having proved transient in its effects and in many ways otherwise lacking. I do not mean to say that a completely destroyed adrenal may be restored or that complete restoration may be had, as in severe Addison's Disease, but it is surprising the number of cases that respond to this vitamin and adrenal protomorphogen therapy.

Another interesting phase of our investigation has been that the pituitary protomorphogen extract has been extremely effective in the syndrome of gastric ulcers. This disease is more common in the male than in the female—I believe that the ratio is about 4 to 1. It seems to be due to a failure of the pituitary to control hormonal balances and to maintain a proper healing rate in general. The so-called sex hormones seem to perform their physiological action by regulating the release and use of protomorphogens. That can be easily understood when you realize that, without the protomorphogen which is released from the tissues and made available to the gonad (the germ producing organ), there would be no reproduction—no hereditary blueprints avail-

*Pituitary
protomorphogen.*