

T Lymphocytes and Killer Cells in Patients with Vitiligo

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Since the last newsletter, we have been involved in determining if antigens on the surface of vitiligo melanocytes are different from those on normal melanocytes. Antigens are proteins on the surface of cells. They differ from one cell type to another and are responsible for stimulating the body's immune system. We want to determine if the immune system reacts differently towards Vitiligo melanocytes compared to normal melanocytes. One way is to determine the surface antigens on these cells. Also we want to determine the antigens on melanocytes change as they become Vitiligo melanocytes. Thus far we have determined that vitiligo melanocytes do have some antigens that are not found on normal melanocytes and vice versa. These have been determined on cells in culture in the laboratory. The older the cultures were the less the concentration of antigen that was detected on both normal and vitiligo melanocytes. We hope to further delineate these antigen differences to determine if the immune system would interact more with certain antigens on the surfaces of these melanocytes.

ADVANCES IN VITILIGO RESEARCH

The past five years have shown remarkable strides in pigment cell biology in general. The melanocyte, both malignant and normal ones, can be grown in cell culture in the laboratory. Normal melanocytes have been very difficult to grow because they are fastidious cells in their growth requirements and because they are very similar in their growth patterns to nerve cells. Normal melanocytes are now being grown in a number of labs both in the United States and abroad. The growth requirements and correct environment for growing these cells have been determined in the past five years.

More importantly, melanocytes grown from the normal appearing skin of vitiligo patients, the so called vitiligo melanocyte, can now be grown in cell culture. Since this is the actual cell which is destroyed in vitiligo, it was vital that it be grown in the lab. This has occurred in the past five years. The ways in which this cell is deficient have been determined in its growth pattern, growth requirements and its structural abnormalities have been determined. The vitiligo melanocyte can now be compared to normal melanocytes to see how they differ. Some of the growth defects of the vitiligo melanocyte are correctible. It has now been determined that the immune system is definitely involved in some types of vitiligo. This provides a strategy for improved treatments for certain types of vitiligo. Other types of vitiligo may not be immune-related but may be due to other causes, such a predisposition of the melanocyte to destruction by certain chemicals. Thus, it is now thought that vitiligo is not one disease. Although all forms of the disease lead to loss of skin color, there may be several causes for the final result of white skin developing in vitiligo patients.

Treatment for vitiligo in the past five years has had some strides, in particular epidermal grafting and melanocyte transplantation. Grafting appears to, be a successful treatment for limited stable areas of vitiligo. The drawback is that it is not feasible for larger areas. Sometimes the grafting can lead to vitiligo in the areas from which donor skin is taken. Melanocyte transplantation involves the harvesting of melanocytes taken from the normally pigmented skin of vitiligo patients and growing them in the lab. After sufficient numbers have grown, they are transplanted into areas of vitiligo in the same patient. This procedure is still in the developmental phases because it takes too large a number of melanocytes to repigment a small area. Also it is very costly and time consuming to grow these cells. Thus, this procedure is done in specialized centers only on an experimental basis.

The mechanisms for repigmentation of standards therapies such as PUVA for vitiligo have been made much clearer in the past five years. It is now definitely known that the source of melanocytes for repigmentation of a Vitiligo patch comes from the hair follicles. This has been assumed in the past but now has actually been demonstrated to take place. Also, the cellular events which maybe responsible for migration of melanocytes through PUVA therapy from hair follicles or normally pigmented skin is now being studied. PUVA therapy may cause the release of substances in the skin which are signals for melanocyte migration.

There are now animal models that have been developed for human vitiligo such as the vitiligo mouse and vitiligo chicken. These should certainly help us to understand vitiligo better from a causation standpoint. The next several years should give even more strides in vitiligo research. Because the vitiligo melanocyte can now be grown in the lab, it can be studied more in depth at the cellular and molecular levels. The gene defect can eventually be identified in these abnormal melanocytes. This can perhaps lead to correcting the defect in these cells as a form of future treatment for the disease. Also, there should be ways to grow the melanocytes faster, easier and in larger numbers so that transplantation can become a more standard therapy for vitiligo. This will also come about in the next few years.