The innermost layer of skin cells is attached to a basal or basement membrane, which also separates it from the inner flesh. As the skin continues to grow, layers of cells are forced outward, but only that layer which remains attached to the basal membrane retains the ability to divide. The outer, or daughter cell layers lose this ability, going through further differentiation and finally dying off. However, when those cells turn cancerous, their growth becomes unlimited and they retain the ability to divide and proliferate even when they become detached from the basement membrane.

Why is attachment so important? Whitfield explains: "If you were a divine engineer and wanted to create a higher life form you wouldn't want it any other way. You would have to incorporate a fail-safe system which would prevent a dislodged cell, say from the eye, from attaching to some other part of the body and growing there as an eye cell. You can imagine how important it is, once contact with the original environment is lost, that

Cells of healthy tissue contain normal chromosomes, are obviously differentiated, and rarely divide. In this example of skin tissue, a pallisade row of cells, attached to a basal membrane, gives rise to new cells which are pushed outward, become differentiated and cease to divide.

Les cellules des tissus sains comportent des chromosomes normaux, sont manifestement différenciées et ne se divisent que rarement. Dans cet échantillon de peau, une couche de cellules à disposition palissadique et fixée à une membrane basale donne naissance à de nouvelles cellules qui sont poussées vers l'extérieur, se différencient et cessent de se diviser.

As early as 2400 B.C., Hippocrates coined the term carcinoma. Cells in carcinomas or malignant tumors contain abnormal chromosomes, are poorly differentiated, and usually divide frequently. Some of these have the ability to invade and grow in other tissues, a process termed metastasis. In this example of skin carcinoma, cancer cells have become detached from the basal membrane yet continue to divide and give rise to other nondifferentiated cells. Some cancer cells pass through the basal membrane barrier invading adjacent tissue.

Dès 2400 av. J.-C., Hippocrate avait inventé le terme «carcinome». Les cellules qui composent les carcinomes ou tumeurs malignes contiennent des chromosomes anormaux, sont mal différenciées et se divisent fréquemment. Certaines de celles-ci peuvent envahir d'autres tissus et s'y développer; c'est le processus de la métastase.

Dans ce carcinome de la peau, des cellules cancéreuses se sont détachées de la membrane basale mais continuent néanmoins à se diviser et à donner naissance à d'autres cellules non différenciées. Certaines cellules cancéreuses traversent la barrière constituée par la membrane basale et envahissent les tissus adjacents. proliferation of that cell cease immediately. The most obvious way to achieve this is to link DNA synthesis with specific attachment — no attachment, no DNA synthesis, and no proliferation. That is one of the things that goes wrong with cancer cells. They no longer need specific attachment to proliferate and can form colonies (or metastases) in various parts of the body."

Dr. Whitfield's research on proliferation and differentiation, although admittedly preliminary, offers some new insights on the development of cancer and may be an important piece in the cancer jigsaw puzzle. His research confirms the importance of the relationship between attachment, DNA synthesis and growth.

In one aspect of Whitfield's research he studied the effect of calcium ions on both cancer and normal cells. "We exposed the two cell types separately to different concentrations of calcium. ranging from low to high levels. It is interesting to note that when normal cells are cultured in flasks, they grow only if they are attached to the surface of the glass, while cancer cells grow freely in suspension. What we found was that, when the calcium concentration was lowered in the culture flask containing normal cells, they did not attach to the glass and ceased to proliferate while cancer cells were

