

THE FIREFLY FACTOR

A firefly may change your future..

Some time ago I mentioned that biotechnology was moving fast and would become the most controversial subject during the next decade. So controversial that it would put the abortion issue on the back-burner. Well hear this: The Firefly Factor has made another dramatic advance.

What may turn out to be the greatest breakthrough in science so far is happening in the field of genetic transfer. This is where a gene, that infinitesimal portion of our DNA code that is, the blueprint that tells our cells to grow like a human and not a giraffe. These genes if damaged or defective sometimes cause disease, malformations or mental aberrations.

The more science learns about these genes in any living thing, ultimately the better it will be for everyone.

Last year some non-traditional scientists led by Keith Wood, a biological chemist at the University of California in San Diego, were the daring pioneers who first succeeded in isolating the gene responsible for the "glow" in fireflies. Now they have broken through another "impossible" barrier. They transferred a gene from the insect world to the plant world. They put the "glow" from a firefly into a tobacco plant! (They chose the tobacco plant, because due to all the research on cancer it has become the most studied plant on earth). Once such a process was proven and duplicatable, research pressed on to other goals. The ultimate extension may be that any gene can be transferred from any living thing into another. Did that wake you up? Think of the implications of that possibility!

Now a further development in the same field. Wood and crew have now produced four different colored clones of the bacteria *E. coli*, from the Jamaican click beetle. They light up not in one color but in

technicolor! This has more implications than just show business. It will allow scientists to track such clones to see how they react within living cells. By tracking four colors they can study several different workings without having to go through another generation for each process -- which would be the procedure if they had just one color to follow each time.

The click beetle has lights at the front end of the abdomen and on top of its head. The "head"light is usually greenish or yellow-green. Abdominal lights run both green or orange. They succeeded in creating four distinct colors for tracking process. So far all colors have a standard enzyme code 543 amino acids long. Minor changes among the genes may enable them to eventually develop more colors.

Lab workers now can tell if other cells downstream from the lit gene are working. If the light is emitted it shows that upstream genes are working. Four different genes can now be tracked in one cell. This is like having four racing cars and the total speed of all four is your travelling speed. One will arrive at the finish line much faster.

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