

Genomics of Skin Aging: Practical Applications

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INTRODUCTION

The past decade has witnessed remarkable advances in the field of biology. Disciplines such as genomics and proteomics have emerged to exploit our growing knowledge of the human genome and have drastically accelerated our ability to understand how the human body responds to its environment.

One of the most important technologies in the genomics toolbox is the gene chip (or microarray). The gene chip allows us to determine which genes are turned on/up or turned off/down in response to different biological conditions. Previously, if we were interested in measuring these gene changes, we would need to do this one gene at a time. However, with the gene chip, we can now monitor tens of thousands of genes in a single experiment; allowing us to monitor nearly the entire genome in less than a week's time. If we tried to do this one gene at a time, each experiment would take nearly 150 years!

Genomics tools such as gene chips have become well established in the medical field over the past ten to fifteen years and most universities have instituted some form of genomics curriculum in their biomedical programs. Furthermore, pharmaceutical companies have seen the potential of this capability and are exploiting it to develop new drugs and therapeutics. While the close connection between genomics technologies and medicine has been well-established over the years, there are other realms of biology that are also showing the benefits of incorporating genomics technologies into their research programs. One of the most interesting of these from a dermatological perspective is skin care.

This workshop describes how the field of skin care is being impacted by improvements in our fundamental understanding of the skin aging process using genomics technology. By incorporating genomics tools into skin aging experiments and in vitro cellular assays, we have gained new and exciting insights into molecular pathways associated with skin aging. These efforts are now beginning to pay off in the discovery of novel skin anti-aging ingredients that are leading to the next-generation of skin care.

Of course, these are still early days and newly emerging genomics technologies will continue to provide us with even deeper insights into the molecular events that trigger skin aging. The future looks bright for skin biology!

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