

The Building Blocks of Discovery



An oft-cited paper by USC professor Ian Hutchinson has made its mark on DNA science.

Photo/Kukla Vera

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Scientific research is a process whereby scientists from around the world make stepped discoveries, building on each other's work along the way.

This collaborative process is illustrated by having research cited by colleagues - often a sign of its influence and significance. Of note, USC School of Pharmacy professor Ian Hutchinson recently reached a 1,000-citation milestone for an article he wrote on an anti-inflammatory protein, indicating his research has proven to be a valuable jumping-off point for future scientific developments.

Hutchinson's publication, "An investigation of polymorphism in the interleukin-10 gene promoter," which appeared in the *European Journal of Immunogenetics* in February 1997, examines interleukin-10 (IL-10), an important anti-inflammatory protein that suppresses immune activation and dampens inflammatory responses.

"My hypothesis was that genetic variability was responsible for the huge range in production of IL-10 among normal people," Hutchinson said. "However, no one believed this was the reason, and computerized genetic analysis was not yet available to show this."

So without the aid of computers, Hutchinson pursued his hunch the old-fashioned way. He printed out several available IL-10 DNA sequences, lined them up on his kitchen table and compared them, letter by letter, to find putative differences.

"Today, this work is done with the push of a button, taking seconds on the computer," Hutchinson explained. "But my decade-old method proved my point - albeit the hard way."

Once he identified the differences, he returned to the lab to confirm his discoveries, again using now-outdated technology such as long sequencing gels.

Hutchinson's research showed that people who are low producers of the IL-10 protein have a strong defense against certain infections and possibly cancer. "On the down side, these same folks have a greater susceptibility to inflammatory conditions, such as heart disease, allergies and autoimmune disorders," he said. "For high producers of IL-10, the opposite protections and susceptibilities are true. Those who are intermediate producers are the lucky ones."

So what made his work so citation-worthy? "This was our first description of the genetic variation [polymorphism] in the IL-10 gene, and our research suggested the wide clinical importance of this finding," Hutchinson noted. "I picked a very

important gene to study in the sense that it is involved in a lot of pathological processes.”

Because of the gene’s diverse involvement, other researchers have cited Hutchinson’s paper in their work on a plethora of topics, including infectious diseases, inflammatory conditions, autoimmunity, transplantation of organs and bone marrow, asthma, allergic reactions to drugs, cancer and cardiovascular diseases.

Hutchinson’s overall body of research focuses on the influence of individual genetic variation on immune responses and on the efficacy of immunosuppressive drugs, with a specific emphasis on the study of transplantation.

A professor of pharmacy in the Titus Family Department of Clinical Pharmacy and Pharmaceutical Economics & Policy, Hutchinson joined the School of Pharmacy in 2005 after teaching at the University of Manchester in England.

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