How did a cancer researcher end up discovering an amino acid that plays a vital role in the body’s immune response, potentially boosting vulnerable people’s disease-fighting power? It seems a world away from investigating how cell growth can get out of control, leading to cancerous tumours, but for Dr. Richard Lamb the discovery was a happy consequence of routine experiments throwing up extraordinary results. Lamb, an associate professor from the department of oncology at the Cross Cancer Institute, explained that although the route of inquiry he took to discover the role of the amino acid arginine in the immune response was a departure from his normal work, it was the logical response to a discovered question. It had to be solved, at least in part, and Lamb’s lab had the power to solve it.

“There’s different types of scientists; there’s scientists that study one question and go to a very deep level to understand it; and then there’s scientists who are more the problem identifiers/solvers, they go from one problem to the next. I’ve done a bit of both [...] but I prefer the identifying a new problem.”

In this case, while testing the removal of amino acids from normal cells, Lamb found a breakdown in the system that attracts infection-fighting macrophages to the site of infection. The question then became which amino acid was causing this effect? Removing arginine from other biochemical systems was known to block signalling processes, so a set of experiments was designed to test the effect of arginine in the immune response. The results were clear; arginine played a major role, although the exact mechanism is still to be determined. But, reaching this conclusion from a series of experiments branching from unsuccessful investigation into another system was remarkable.

Lamb is enthusiastic about the workings of science, and believes the mantra of science funding bodies should be ‘people, not projects’. Real scientific progress is rarely made within the confines of a set proposal, carried through to the letter to the very end, producing the exact result first aimed for. If this were true, his lab would never have discovered the critical role of arginine, which certainly has profound implications for human health. The potential benefits include the treatment of undernourished people, intensive care patients and even arthritis sufferers, if an excess of arginine is found to cause an overreaction of the immune system.

However, Lamb’s lab will leave these deeper issues to other researchers and return to focusing on its original purpose of working out the mechanism by which cell growth is controlled by a complex pathway of chemical signalling. Normal cell growth is limited, but some part of this pathway breaks down in many cases of cancer, causing runaway growth. There are still many problems to be identified and solved.

“The abnormalities that are found in cancer just present opportunity for basic researchers like me to try and delve deeper into understanding what’s happening normally, to then understand what’s going on in cancer.”

No study is completed by one person though, and on the scientific journey from cancer to immunity Lamb took with him many colleagues in labs across Europe and in particular his post-doctoral fellow, Virginie Mieulet. Mieulet has now moved on to her own lab, and will hopefully continue to investigate the importance of arginine. Any further progress to bring the benefits of arginine to the real world will require collaboration between many experts in a range of fields.