Scientists discover new 'off switch' in immune response

February 28 2012

Scientists from Trinity College Dublin have discovered a new 'off switch' in our immune response which could be boosted in diseases caused by over-activation of our immune system, or blocked to improve vaccines. The findings are published this week in the journal *Nature Communications*. The research was funded by Health Research Board, Ireland and Science Foundation Ireland.

The research team, led by Dr Anne McGettrick and Professor Luke O'Neill, at the Trinity Biomedical Sciences Institute, have discovered that a protein, called TMED7, can shut down part of our immune system once an infection has been eliminated. "Without stop signals like TMED7 our immune system would continue to rage out of control long after the infection has been cleared, leading to diseases such as septic shock," says Dr Anne McGettrick. Manipulating these stop signals could help dampen down our immune system to prevent it attacking our own bodies.

In certain cases, removing stop signals and boosting our immune system can be advantageous. Several diseases such as Malaria and HIV are lacking good vaccines and research laboratories and drug companies around the world are looking to solve this problem. One major issue facing vaccine development is the fact that our immune systems do not mount a strong enough immune response to the vaccine, causing the vaccine to be ineffective. TMED7 limits a key process needed for vaccines to work involving a protein called TLR4. "Removing TMED7 from our cells could help boost our immune response to vaccines thus

making the vaccines much more effective," says Dr Sarah Doyle, lead author on the publication.

TMED7 is part of a family of proteins and it is the first member of this family to be implicated in regulating our immune system. Interestingly, it is conserved through evolution and a version in fruit flies called logjam acts similarly to TMED7, limiting anti-bacterial responses. Further research will reveal if other members of this family play key roles in immunity, and this could lead to exciting new prospects for understanding our immune system. The research was carried out in collaboration with the Norwegian University of Science and Technology, Trondheim, Norway.

Provided by Trinity College Dublin