

New study visualises how HPV attacks human proteins

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(PhysOrg.com) -- An international study involving Conway Fellow Dr Neil Ferguson has described how the human papillomavirus (HPV) interferes with the body's natural inclination to kill infected cells and exposes the individual to cervical cancer. The research article by scientists from Uppsala University and Linköping University in Sweden, University of Copenhagen and University College Dublin has been highlighted for mention in the February 4th issue of the *Journal of Biological Chemistry*.

The body naturally rids itself of infected cells by targeting them for destruction or programmed cell death. HPV must evade this natural defence mechanism in order to survive and replicate. It does this by sending out two proteins, E6 and E7 to bind with defensive human proteins and stop them in their tracks.

This research set about to visualise exactly how the HPV protein E7 binds to one human protein in particular, SAP97. Explaining the rationale, Dr Ferguson said, "To develop antivirals that prevent protein-protein interactions, in this case those of E6 and human proteins, it is necessary to first understand the biomolecular interactions required for virus viability and, where relevant, exploit these insights".

The researchers looked at how fast E6 latched onto and came off SAP97, how strongly it bound to the human protein and what happened to the shape of SAP97 consequently.

Additionally, the team discovered that there are actually three locations on the human SAP97 protein where HPV's E7 can latch on and prevent SAP97 from functioning normally. Interestingly, they found that up to three E7 molecules can attach to one human SAP97 simultaneously - effectively ganging up on the [protein](#).

Infection by high-risk HPV is one of the most common forms of cancer causing up to 500,000 cases of cervical cancer and more than 20,000 deaths in women annually. The two vaccines currently available work by preventing HPV infection but do nothing for those already infected.

Neil Ferguson believes that this work funded by the Swedish Research Council and Science Foundation Ireland “represents an important step forward in understanding HPV biology and has implications for therapeutic strategies”.

More information: Biophysical characterization of the complex between human papillomavirus E6 protein and synapse associated protein 97*, [doi:10.1074/jbc.M110.190264](https://doi.org/10.1074/jbc.M110.190264)

Provided by University College Dublin

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