SMART-ID Research on Pneumonia-Causing Bacteria Accepted for Publication in PNAS

18th June 2015: A new study by a team of researchers consisting of the Infectious Diseases Interdisciplinary Research Group of the Singapore-MIT Alliance of for Research and Technology (SMART-ID), MIT in Boston and the Temasek Life Sciences Laboratory have found that a bacteria strain (*Streptococcus pneumonia)* that commonly causes pneumonia can be detrimental to the cells that line and protect the lung. This work was recently accepted in the prestigious journal the *Proceedings of the National Academy of Sciences USA* (PNAS). SMART-ID PhD student Mr Prashant Rai was the lead author, who is supervised by A/Prof Vincent Chow (NUS and SMART-ID) and Prof Bevin Engelward (MIT-Boston and SMART-ID).

In this study, Mr Rai and colleagues have found that the pneumonia-causing bacterial cells were capable of secreting hydrogen peroxide, a chemical compound commonly found in bleach. This chemical causes breaks in the DNA of lung cells, which then kicks off a lethal cascade of events leading to cell death. As the defences in the lung were hampered by the decrease in healthy lung-lining cells, this makes it easier for the bacteria to enter the blood-stream and cause more trouble. It is also interesting to note that some sub-strains of the bacteria produce more hydrogen peroxide than others, and this toxic chemical level is linked to the bacteria's ability to cause more harm and illness to the host. As the capacity to repair DNA varies among people, pneumonia patients in the future could benefit from tailor-made treatments based on their DNA-repair ability and identifying the specific sub-strain of bacteria that is causing the disease.

Click here to access the published manuscript, or here for a detailed write-up by MIT News. To know more about the technological capabilities of SMART, please visit the CREATE website for more information.

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