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Singapore finds molecule for dual protection against vascular inflammation

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The researchers found a new peptide that is made only when cells undergo inflammation and infection

A multidisciplinary team of researchers from Duke-NUS Medical School and the Agency for Science, Technology and Research (A*STAR) in Singapore has discovered a new mitochondrial peptide called MOCCI that plays an important role in regulating inflammation of blood vessel and immunity.

The study, published in the journal *Nature Communications*, revealed how one gene encoded two molecules that provide two-pronged protection following viral infection.

“In this study, we aimed to identify new targets to combat inflammation in the lining of blood vessels. Specifically, we wanted to target small naturally-produced peptides that have not been studied before,” explained Assistant Professor Lena Ho, from the Cardiovascular and Metabolic Disorders Programme at Duke-NUS, who led the team that included Associate Professor Ashley St John, Assistant Professor Owen Rackham and Senior Research Fellow Dr Cheryl Lee.

They found a new peptide, which they named MOCCI—short for Modulator of Cytochrome C oxidase during Inflammation—that is made only when cells undergo inflammation and infection.

To their surprise, they discovered that MOCCI is a hitherto unknown component of Complex IV, a part of a series of enzymes in the mitochondria responsible for energy production, called the electron transport chain. During inflammation, MOCCI incorporates into Complex IV to dampen its activity. Collaborating with Assoc Prof St John at Duke-NUS, the researchers found that this dampening is required to reduce inflammation following viral infection.

The researchers say the next step is to explore how to develop targeted pharmacological treatments that can mimic the anti-inflammatory effects of MOCCI. They also plan to investigate the role of MOCCI in common chronic inflammatory diseases such as colitis and psoriasis.