Progress Report

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Title of Project: Substance P: Targeting brain swelling to improve long-term outcome following stroke

Summary: *(approximately 1,000 words)*
Cerebral oedema and the subsequent development of raised pressure within the brain are life-threatening complications of stroke associated with a significant burden of mortality and poor outcome in survivors. Despite this, treatments remain limited and fail to address the cause of the swelling. As such, new treatments are urgently required.

We have discovered that the neuropeptide substance P is involved in breakdown of the blood-brain barrier and subsequent development of cerebral oedema and poor outcome following stroke. The purpose of this study was to assess whether blocking the action of substance P by administering an NK1 antagonist would reduce the development of cerebral oedema and in turn improve outcome.

Hypothesis vs Findings
We hypothesised that by blocking the action of substance P, we could reduce cerebral oedema formation following stroke and thereby improve outcome long-term. Indeed, this is exactly what we have found. To date, we have shown that treatment with the NK1 antagonist improves outcome, as measured at 7 days following stroke. Specifically, treatment with the NK1 antagonist has reduced the level of disability observed following stroke.

Unanswered Questions
Studies are still ongoing and we are in the process of assessing whether this improvement in outcome we have observed is sustained beyond 7 days following stroke.

What these research outcomes mean
Our findings suggest that treatment early on following a stroke with an NK1 antagonist may be beneficial in reducing the development of cerebral oedema and in turn improving both outcome and survival. Essentially, if we can reduced the development of cerebral oedema and its associated deleterious consequences then we may be able to save patients lives and improve their long-term outcome.

Clinical assessment of the NK1 antagonist is currently underway, with Phase I clinical trials being conducted by CMAX to assess the safety of the compound and the next step to test the intervention in patients who have suffered injuries to the brain.