Acquired resistance to combination drug treatment in cancer

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A team of scientists led by Dr Bhaskar Bhattacharya and Associate Professor Richie Soong from the Cancer Science Institute of Singapore (CSI Singapore) at the National University of Singapore (NUS) conducted a study on acquired resistance (AQR) to combination drug treatment in cancer and found that the mechanisms of AQR for the combination drugs were different from that of the individual drugs. The findings from this study could potentially contribute to reducing AQR to combination drug treatment in cancer.

AQR is the lack of response to drug treatment that occurs after months of continued treatment, often leading to the cancer recurring. Combination drug treatment is a strategy commonly used in cancer therapy today to attack cancer more effectively through combining the effects of individual drugs and their interaction.

Traditionally, AQR to combination drug resistance had been understood through studying the mechanisms of AQR to individual drugs and adding up the effects. However, by studying a combination treatment that is currently being tested in clinical trials for colorectal cancer, the research team found the mechanisms of AQR to the drugs applied in combination were different from the mechanisms of AQR to treatment with the drugs individually. A major reason was that AQR to combination treatment included the effects of the interaction of the drugs as well as the effects of the individual drugs, while AQR to the individual drugs did not include the effects of the drug interaction.

Assoc Prof Richie Soong said, "Our study sets the precedent for studying drug combinations, and not just individual drugs, to develop better strategies for treating AQR to combination therapies."

"Moving forward, we are studying the mechanism of AQR for other combination treatments. We are also extending our studies to understand drug resistance in tumour models that better simulate the tumour environment. Additionally, we will also be studying cancer as a multi-factor system to help predict AQR," added Dr Bhattacharya.

The findings of the study were published in the journal *Oncotarget* in April 2016.

More information: Bhaskar Bhattacharya et al. Acquired resistance to combination treatment through loss of synergy with MEK and PI3K inhibitors in colorectal cancer, *Oncotarget* (2016). DOI: 10.18632/oncotarget.8692

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