The Effects of the Chemotherapy Drug Cisplatin on Cell Migration

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Cell migration is an essential function of all living cells. In mammalian cells, cell migration plays a crucial role such as promoting organ development, sperm and egg motility, and wound healing. However, in cancer, cell migration promotes metastasis, which is the primary cause of cancer patient mortality. The mechanisms that underlie cell promotion are emerging. Our research displayed that the scaffold oncoprotein IQGAP1 normally regulates cell migration by controlling kidney epithelial cell adhesion. Thirty percent of cancer patients treated with chemotherapy develop acute kidney injury, but the mechanism underlying this fatal condition is unknown. We hypothesized that chemotherapy drugs displace IQGAP1 from cell junctions and increase cell migration and dissociation of renal cells. Using wound healing assays and the model Madin-Darby Canine kidney cells (MDCK), we evaluated the effects of the standard-of-care chemotherapy drug cisplatin on cell migration.

Our results illustrated that cisplatin significantly inhibited cell migration. These results are also consistent with our findings that cisplatin inhibits cell proliferation. Furthermore, cisplatin leads to treatment-resistant kidney cell injury. Therefore, this data paves the way for our ongoing studies on the role of IQGAP1 as a target of cisplatin.

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