Lithium inhibits carcinoid cell growth in vitro.
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Abstract
Carcinoids are slow growing neuroendocrine tumors that often cause debilitating symptoms due to excessive secretion of hormones
such as serotonin. Surgery is the only potentially curative treatment, but many patients have unresectable metastatic disease. Lithium
is a non-competitive inhibitor of GSK-3 with an established safety profile. The objective of this study was to investigate the effects
of lithium on carcinoid cell growth in vitro. Lithium treatment caused a dose-dependent reduction in carcinoid cancer cell (BON and H727)
growth. Western blot analysis revealed increased expression of cleaved poly (ADP-ribose) polymerase (PARP), indicating the induction
of apoptosis. Lithium treatment also suppressed cellular levels of serotonin and chromogranin A. In summary, lithium inactivates GSK-3,
induces apoptosis, and suppresses carcinoid cancer cell growth in vitro. The drug has been used clinically since the 19(th) century to
treat a variety of diseases including bipolar disorder, and its safety profile is well documented. Therefore, based on these findings, we
have undertaken a clinical trial of lithium chloride in the treatment of patients with unresectable carcinoid cancer.

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