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CANCER

Selumetinib promotes radioiodine uptake in thyroid cancers

The MAPK kinase inhibitor selumetinib induces radioiodine (^{131}I) uptake and retention in human thyroid tumours that were previously refractory to radioiodine treatment, report researchers.

The prognosis of patients with metastatic thyroid cancers resistant to radioiodine therapy is poor. However, preclinical data indicate that in transgenic mice with thyroid cancers resistant to radioiodine therapy, inhibitors of the MAPK pathway can render tumours responsive to radioiodine by enabling the tumours to 'trap' iodine.

Ho and co-workers assessed whether the selective MAPK kinase inhibitor selumetinib could have a similar effect in the tumours of 20 patients with metastatic thyroid cancers refractory to radioiodine therapy. Five patients had tumours with *NRAS* mutations and nine had tumours with *BRAF* mutations. The researchers used ^{124}I PET-CT to quantify the uptake of iodine by the patients' tumours before and 4 weeks after treatment with 75 mg of selumetinib given twice daily. Uptake of ^{124}I increased in 12 of the 20 patients after selumetinib treatment. These included all five patients with *NRAS*-mutant disease and four of the patients with *BRAF*-mutant disease. The dosimetry threshold for radioiodine (^{131}I) therapy was meet in eight of the 12 patients, and resulted in a partial response in five patients and stable disease in three.

The researchers hail the results as a proof of principle that MAPK kinase inhibitors can enhance radioiodine uptake in advanced thyroid cancers, and they suggest that the approach might be particularly effective in patients with tumours with *NRAS* mutations.

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Original article Ho, A. L. *et al.* Selumetinib-enhanced radioiodine uptake in advanced thyroid cancer. *N. Engl. J. Med.* **368**, 623–632 (2013)