

## Spotlight

By M.O.

### Starving Tumors, One Metastasis at a Time

Shelton *et al.*

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Growing evidence suggests that glutamine is a major energy substrate for cancer cells, including glioma, HeLa and prostate cancer cell lines. However, while much is known about how these cells use blood sugar to make energy, not much is known about how they utilize glutamine. To address whether glutamine is an important energy source for tumors *in vivo*, Shelton and colleagues tested the efficacy of a glutamine-targeting drug in the VM-M3 mouse model. Some VM-M3 tumors share many properties with glioblastoma multiforme and many show a tendency for systemic metastasis.

Importantly, VM-M3 tumor cells express firefly luciferase, thereby facilitating *in vivo* monitoring of tumor growth and metastasis by bioluminescence imaging.

The authors show that the VM-M3 tumor cell line is more dependent on glutamine than glucose for survival *in vitro*. They further show that treatment with the glutamine analogue 6-diazo-5-oxo-L-norleucine (DON) potently inhibited primary tumor growth and systemic metastasis *in vivo*. Tumor growth, but not the development of systemic metastases, was also reduced in mice undergoing caloric restriction, a treatment known to reduce blood glucose levels. When DON was added to cultured cancer cells, cell growth was inhibited in line with previously reported effects of the drug on cell proliferation. The authors conclude that targeting glutamine may be a promising strategy for managing systemic metastasis in cancer patients. They also point out that diets low in glutamate may further inhibit tumor growth and metastasis when combined with glutamine antagonists.