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Abstract

This work describes:

- Topological analysis of the vasculature of tumours.
- Analysis is performed with a scale-space technique.
- Scale-space traces vessels as topological ridges of the image intensities
- A series of measurements (length, width, density, etc.) are obtained, which are used to compare the vasculatures.

Tumours of SW1222 human colorectal carcinoma xenografts were observed when growing in dorsal skin-fold window chambers in mice. Three variants of the tumours expressing either

- endogenous levels of angiopoietins (WT) or
- over-expressing either angiopoietin-1 (Ang-1) or
- angiopoietin-2 (Ang-2)

were assessed with/without vascular targeted therapy (combretastatin A4 phosphate (CA4P; fosbretabulin)).

The measurements reported statistically significant differences between the three tumour types thus confirming the topological analysis as a suitable technique to analyse changes in vasculature.

Moreover, the measurements obtained confirmed the effects of angiopoietins as previously reported in the literature.