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Microcoil MRI of plants and algae at ultra-high field : an exploration of metabolic imaging

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PROPOSITIONS

Belonging to thesis entitled:

MICROCOIL MRI OF PLANTS AND ALGAE AT ULTRA-HIGH FIELD

An exploration of metabolic imaging

- I. *Botryococcus braunii* var. *Showa* exhibits two distinct types of colonies when grown under high light conditions (This thesis, Chapter 2).
- II. Volume normalised SNR is a useful measure to compare relative sensitivity for various coil designs at ultra-high field (This thesis, Chapter 3).
- III. Cellular resolution can be attained on root nodules of *Medicago truncatula* using microcoils in ultra-high field (This thesis, Chapter 4).
- IV. Diffusion weighting incorporated into chemical shift imaging, (DW-CSI), can accurately distinguish metabolites at high field (This thesis, Chapter 5).
- V. There is great potential for microcoils in combination with flow-chambers, cryogenically cooled RF circuits and integrated imaging gradients.
- VI. Extensive reforestation will result in a global change to a plant-based diet.
- VII. Scientific findings that challenge societal beliefs should be communicated in the form of moral narratives.
- VIII. The contradictions and complexity of collaboration and competition in science are an excellent metaphor for life: one cannot exist without the other.
- IX. The solutions to halt catastrophic climate change, if any, will come from philosophy and the humanities, not from the natural sciences.
- X. Fiction-based drama is better at engaging audiences with complex scientific concepts than traditional science communication.