**Multicentre initiative for standardisation of image biomarkers**

**Image Biomarker Standardisation Initiative (IBSI)**

**Why standardise image biomarkers?**
Medical image analysis may be used to improve cancer treatment, for example through:
- Prognosis of treatment success and plan adaptation
- Early detection of malignant lesions
- Identification of radio-resistant tumour segments

Medical image analysis requires calculation of image biomarkers (features). Examples are tumour volume, mean tumour image intensity and textural smoothness.

Image biomarkers and image processing lead to many degrees of freedom in implementation. Standardisation is required to:
- Reduce variation between clinical trials involving image biomarker analysis
- Ensure that clinical findings reflect metabolic processes instead of differences in implementation

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**Phase 1: Feature standardisation**
- Participants extract features from digital phantom, without image processing
- Extracted feature values are collected and shared
- Issues in definition and implementation are iteratively resolved

**Phase 2: Image processing benchmarks**
Benchmark of image processing based on CT image data of lung cancer patient. Methodology is similar to phase 1, but focuses on image processing instead.

**Example case:**
- Trilinear interpolation to 2x2x2 mm
- Resegmentation of gross tumour volume region of interest (ROI) to [-500, 400] HU range
- No spatial filters
- Discretisation using 25 HU wide bins

**Current status:**
- Identify and resolve differences in segmentation and interpolation procedures

**Conclusions:**
- Benchmarking of features is recommended: high initial differences
- Standard values found for most features