Royal Microscopical Society

Policy on Artificial Intelligence (AI) and Computational Image Processing in Competitions

The Royal Microscopical Society aims to celebrate excellence in microscopy, scientific imaging, visual communication, and public engagement. This policy provides guidance on the acceptable use of Artificial Intelligence (AI), machine learning, computational image processing, and related technologies in all RMS competitions and in particular the popular RMS Scientific Imaging Competition

The policy seeks to:

- Preserve scientific integrity and authenticity.
- Ensure fairness for all entrants.
- Encourage innovation and responsible use of emerging technologies.
- Maintain public and member confidence in competition outcomes.
- Provide transparency around image creation and processing methods.

All entries must be based on genuine observational data acquired through microscopy or imaging techniques specified within the competition rules.

The use of AI must never misrepresent, fabricate, invent, or substantially alter scientific observations in a way that could mislead judges, viewers, or the public.

3. Categories of AI Use

Permitted Uses

The following uses are generally acceptable provided they are fully disclosed:

Image enhancement

- Noise reduction
- Deconvolution
- Focus stacking
- Contrast optimisation
- Illumination correction
- Background subtraction

Assisted analysis

- Segmentation of structures
- Cell identification
- Feature detection
- Object tracking
- Classification tools

Visualisation

- False colouring
- Rendering of genuine microscopy datasets
- 3D reconstruction from acquired data
- AI-assisted interpolation that does not create new biological structures

Accessibility and presentation

- Caption generation
- Metadata organisation
- Translation of supporting text

All AI-assisted processing must be applied to data originating from real specimens, images, or videos captured by the entrant.

Restricted Uses

The following may be accepted only if explicitly permitted within a competition category and fully declared:

- Generative fill or content-aware replacement.
- AI interpolation generating entirely new image frames.
- AI reconstruction where significant image information is inferred rather than observed.
- Hybrid compositions combining genuine microscopy data with synthetic content.

Such entries may be placed in a separate category or considered ineligible for scientific image awards.

Prohibited Uses

The following are not permitted unless a competition category explicitly invites AI-generated artwork:

- Fully AI-generated images.
- Images created primarily from text prompts.
- Fabrication of cells, tissues, organisms, structures, or experimental data.

- Addition of biological features not present in the original dataset.
- Removal of features that materially alter scientific interpretation.
- Submission of synthetic content as genuine microscopy.

Any deliberate attempt to conceal AI generation may result in disqualification.

Transparency Requirements

All entrants must declare:

1. Whether AI tools were used.
2. The software used.
3. The purpose of the AI tool.
4. Which stages of processing involved AI.
5. Whether any image content was generated, reconstructed, predicted, or inferred.

Entrants may be required to submit:

- Raw image files.
- Metadata.
- Processing workflows.
- Analysis pipelines.
- Original video sequences.

Failure to provide supporting evidence may result in disqualification.

Judging Considerations

Judges will assess:

- Scientific authenticity.
- Technical excellence.
- Artistic merit.
- Transparency of methods.
- Appropriate and ethical use of computational tools.

Use of AI alone will neither advantage nor disadvantage an entry. Judging will focus on the quality, originality, and integrity of the work.

Verification and Audit

The RMS reserves the right to:

- Request raw data.
- Request original microscopy files.
- Request additional documentation.

- Conduct independent technical reviews.
- Consult external imaging experts.

If concerns arise regarding authenticity, entries may be suspended from judging pending review.

Competition Categories

Where appropriate, RMS competitions may include:

Scientific Imaging Category

Only genuine microscopy-derived images and videos are permitted. AI may be used solely for enhancement, analysis, and visualisation of authentic data.

Artistic Imaging Category

Creative manipulation may be permitted, but the extent of AI involvement must be clearly disclosed.

AI and Computational Imaging Category (Optional Future Category)

Entries showcasing innovative computational and AI-assisted visualisation methods may be submitted, provided methodologies are fully documented

Declaration Statement

I certify that:

This entry is based on microscopy data acquired by me or the people named in the application;

I have disclosed every AI, machine learning, computational and manual processing step used, to the best of my knowledge;

no undeclared generated, synthetic or inferred content is included;

I understand that inaccurate or incomplete disclosure may lead to disqualification or withdrawal of an award.

Signature

Sanctions

The RMS may:

- Disqualify an entry.
- Withdraw an award.
- Remove published images.
- Prohibit future submissions for a defined period.

Sanctions will be proportionate to the severity of any breach.