# Modalities combined. Intelligence driven.

## Key features

- One analysis platform for multiple compatible Revvity modalities
- AI-assisted whole-body recognition and organ-specific segmentations
- Automated bioluminescence kinetic curves
- Intuitive co-registration capability
- Streamlined batch processing of studies

## Living Image Synergy AI multimodality software

Living Image™ Synergy AI multimodal image analysis software addresses the complexity of analyzing data from multiple imaging platforms by providing a unified analytical framework that combines IVIS™ optical imaging, Quantum™ microCT, and Vega™ ultrasound modalities into one integrated software environment.

As a complement to existing software such as Living Image, SonoEQ™, or microCT programs, which continue to remain essential for data acquisition and visualization, adding the Living Image Synergy AI software can help take data analysis to the next level.

By combining multimodal data into a single platform, Living Image Synergy AI software helps to streamline imaging analysis. Researchers can analyze complex datasets in just a few clicks and leverage integrated AI algorithms to enhance image processing workflows.

Through standardized analytical protocols across imaging platforms, Living Image Synergy AI supports improvement in data consistency and reproducibility, reduction of inter-operator variability, and helps increase efficiency which can shorten the time from data to decisions.
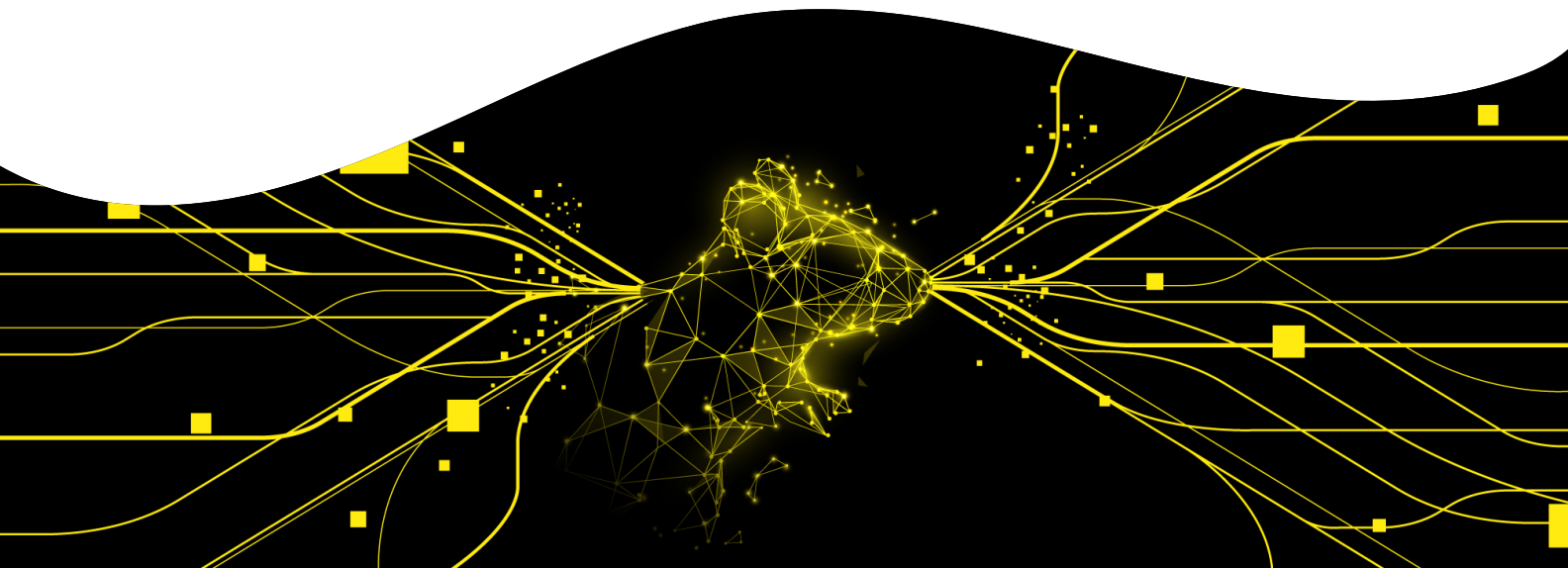
## One analysis program for multiple modalities

By integrating multiple imaging modality analysis into a single, cohesive platform, Living Image Synergy AI software allows scientists to efficiently analyze data from different compatible Revvity imaging modalities without switching between multiple programs. This unified approach improves data analysis efficiency by:

- **Reducing redundant tasks** such as repeated image segmentation.

- **Integrating data management** as a tool to organize data into a single project.

- **Automating AI analysis to help enhance data** integrity and reproducibility across complex longitudinal studies

- **Streamlining imaging workflows** by reducing manual effort, accelerating timelines, and standardizing data processing.

- **Helping simplify software adoption** by reducing the need to learn multiple platforms saving researchers time and effort.
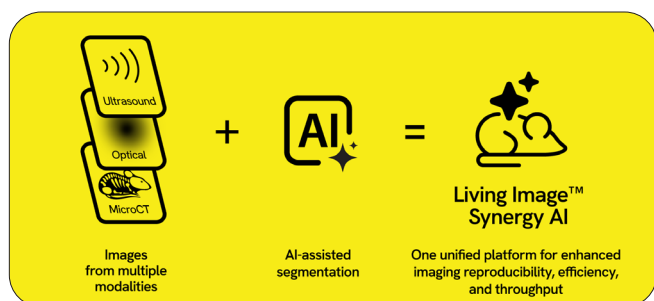


Figure 1: Living Image Synergy AI combines imaging analysis from multiple compatible Revvity modalities plus AI-assisted segmentation into a unified software.



Figure 2: Living Image Synergy AI multimodality software.

## Intelligence-driven

**AI-powered preclinical imaging software**

Living Image Synergy AI applies AI-assisted whole-body recognition and organ-specific segmentations providing capabilities that:

- Support enhanced consistency and increased efficiency

- Improve analytical accuracy through intelligent algorithms

- Help reduce analysis time

- Assist in decreasing intra- and inter-user variability, increasing reproducibility

- Provide advanced manual segmentation tools allowing review of AI-generated data

- Offer AI-segmentation algorithms*

- Incorporate a streamlined analysis workflow which can help shorten the time from data to decisions

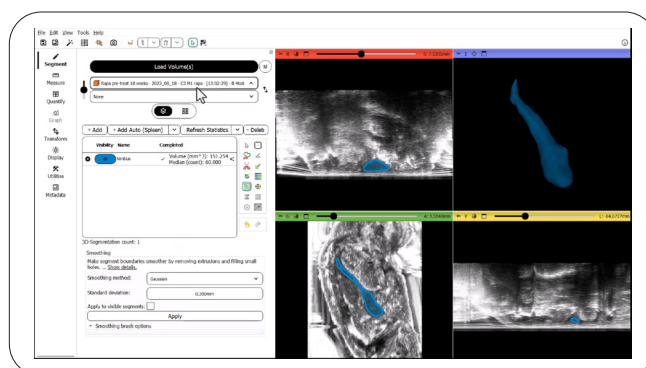- Provide consistent automated identifications versus misidentifications due to user fatigue over time



Figure 3: AI-assisted organ segmentation. Example of mouse spleen identification in 3D using the Vega ultrasound system.
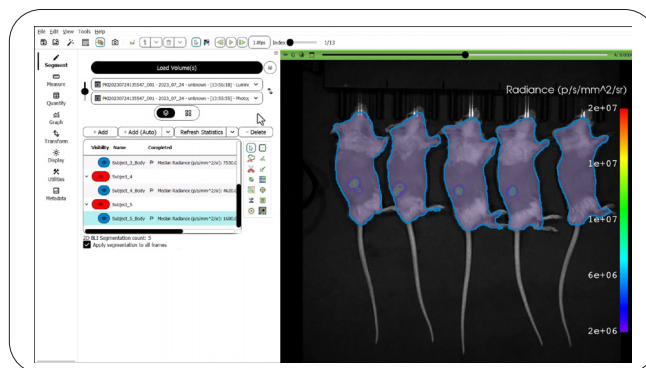


Figure 4: AI-assisted body contour segmentation on multiple animals helping to accelerate data processing time.

*All models confirmed through peer review and statistically viable using DICE & IoU scoring. Contact us for details.

## AI-assisted whole-body recognition and organ-specific segmentations

Living Image Synergy AI software enhances preclinical imaging workflows through intelligence-driven automation and AI-assisted whole-body recognition with organ-specific segmentation.

By consolidating data from multiple imaging systems into a single platform, researchers can tackle complex questions faster while achieving increased statistical robustness in treatment response assessments and reduced analysis time.

**Moving the needle in optical imaging analysis**

Living Image Synergy AI software provides whole-body recognition of optical data, matching high-throughput data acquisition with high-throughput AI-assisted analysis. With just one-click, AI-assisted data processing of an entire study can reduce the analysis time by up to 60-fold.

**AI-Powered organ segmentation**

Rapid 3D organ identification, volume segmentation and data analysis can be performed in Living Image Synergy AI software with streamlined AI assisted workflows.

Our ongoing development of AI models leverage Revvity's Nimbus AI program, built on real-world data from multiple imaging modalities and years of expertise in developing specialized models for organ AI-assisted segmentation including spleen, liver, lungs, bone, kidney, bladder, and tumors. Figure 3 demonstrates Living Image Synergy AI software's capability highlighting segmentation of a mouse spleen model.

**Nimbus AI accelerated analysis: Advanced machine learning for preclinical imaging**

Transform your preclinical imaging research with our Nimbus AI Accelerated Analysis Program and collaborate with us to explore opportunities for developing AI models specific to your applications. This program leverages AI-assisted whole-body recognition & organ-specific segmentations from multiple modalities including optical, ultrasound, and microCT.

Contact us if you would like to participate in our Nimbus AI program.

## Streamline image analysis with automated batch processing

Due to the volume of data generated from *in vivo* imaging studies, being able to apply predefined operations to a large number of image files automatically helps to increase imaging workflow efficiency.

Living Image Synergy AI's batch processing feature allows you to automatically apply organ segmentation and whole-body contouring across multiple *in vivo* images, reducing repetitive manual steps and helping maintain consistency across your datasets.

**Current batch processing capabilities include:**

- **Automated organ segmentation:** Apply consistent segmentation parameters across multiple images
- **Whole body contour segmentation:** Standardize whole mouse recognition and measurements across datasets
- **Ongoing development:** Future updates may include batch processing with comprehensive analysis workflows and enhanced automation tools

**Benefits of batch processing:**

- **Efficient:** Reduces time spent on repetitive image preparation tasks
- **Reproducible:** Supports consistent processing parameters across images in your study
- **Scalable:** Handles larger datasets more effectively than manual processing
- **Reduces data analysis fatigue:** Helps to reduce errors from long data analysis sessions
- **Helps with resource optimization:** Process multiple images unattended, which may free you to perform other tasks

## Automated bioluminescence kinetic curve analysis

Kinetic curve analysis is essential in bioluminescence imaging to find the optimal time point for image acquisition after luciferin injection.

Since bioluminescent kinetics vary widely across different experimental models (e.g., cancers, nanoparticles, cell & gene therapies), it is crucial to characterize and report the peak bioluminescent signal window for each study.

Living Image Synergy AI software streamlines your workflow through automated kinetic curve analysis of bioluminescent signals, helping to pinpoint better timing for image acquisition to enhance efficiency and data quality.



Figure 5: AI-assisted body contour segmentation with auto-quantification and calculation of kinetic curve to help identify the optimal bioluminescence imaging window post luciferin injection.



Figure 6: Living Image Synergy AI batch processing workflow. No need to load your data, no need for manual segmentation, no tedious step by step analysis.

## Co-registration: Bridging functional and Anatomical images

For scientists wanting to combine functional readouts with anatomical data, Living Image Synergy AI co-registers data from modalities such as optical, microCT, and ultrasound.

Living Image Synergy AI software streamlines the complex process of image co-registration with an intuitive, user-friendly interface. Researchers can align images from different modalities or time points through semi-automatic co-registration in 3D space achieving anatomical co-localization.

This flexible software for co-registration supports smooth overlay of 3D bioluminescent, 3D fluorescent, microCT, and ultrasound images which can provide spatial correlation of functional with anatomical data with enhanced accuracy. The software's intuitive controls help reduce the technical barriers often associated with multi-modal image alignment, allowing scientists to create co-registered datasets efficiently.

- Co-registration of any two datasets with the use of fiducial markers
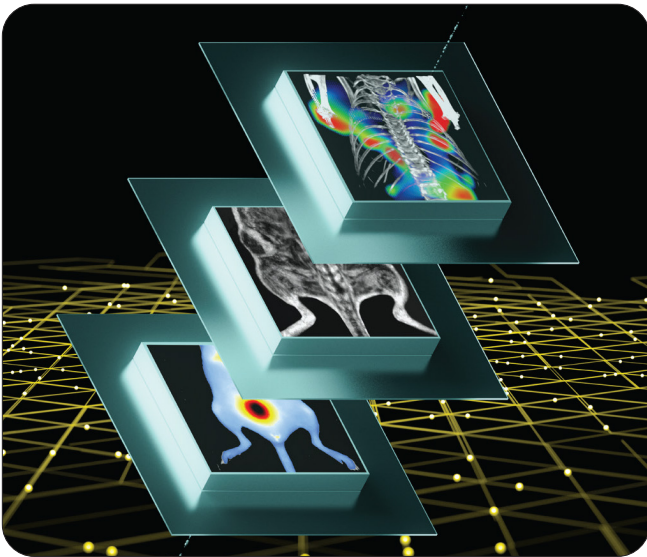- Co-registration any two 3D imaging datasets by user defined anatomical reference points



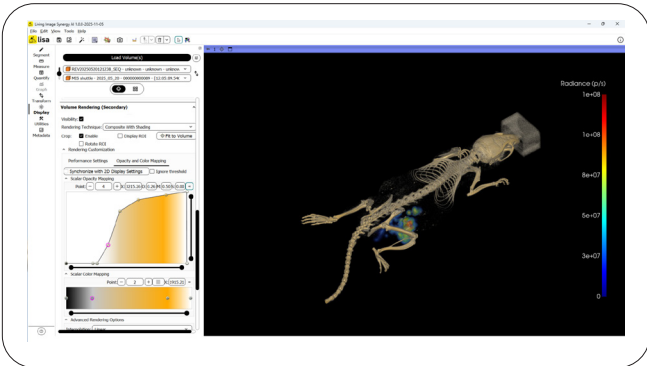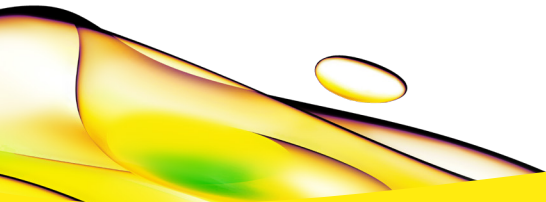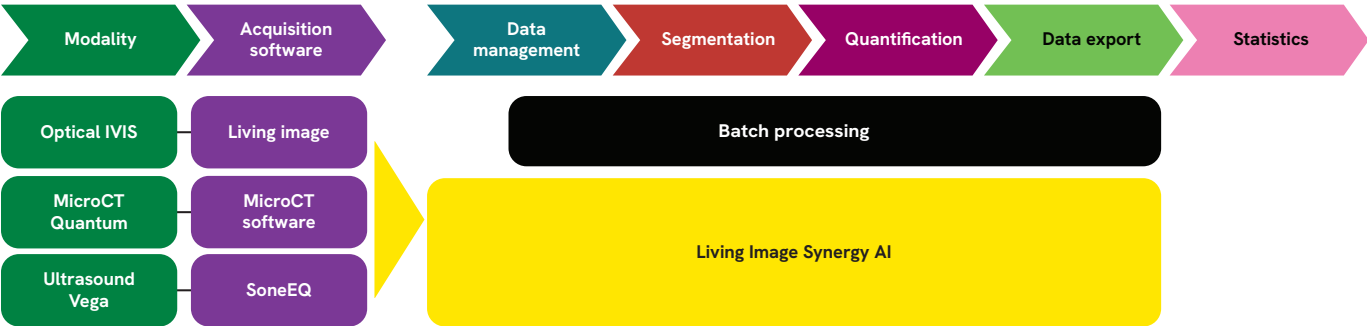Figure 7: Co-registration between multiple modalities.



Figure 8: Automated co-registration of data from multiple imaging modalities. Example of a mouse scanned with IVIS Spectrum 2 and Quantum GX3 system combining optical and microCT data.

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## In vivo imaging data acquisition and management workflow

| Modality | Acquisition software | | Data management | Segmentation | Quantification | Data export | Statistics |

| Optical IVIS | Living image |
| MicroCT Quantum | MicroCT software |
| Ultrasound Vega | SoneEQ |

**Batch processing**

**Living Image Synergy AI**

**For research use only. Not for use in diagnostic procedures.**

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