

Introduction

Several AI companies and research groups are evaluating the potential of **using AI to identify abnormal findings** in preclinical pathology tissues. We are optimising a generalized approach for abnormality detection using **AI and other Machine Learning** approaches. To develop a system with unbiased comparison of the performance of different techniques, a generalized evaluation method is required.

Deciphex are collaborating with Janssen R&D to facilitate the development of a validation cohort using a combination of proprietary and publicly available content. A standardized data representation format is utilized to allow interoperability between data coming from distinct sources. This strategy for performance evaluation on a **diversity of organs** and diversity of findings with a **range of severities** is pivotal to facilitate global application of our workflow.

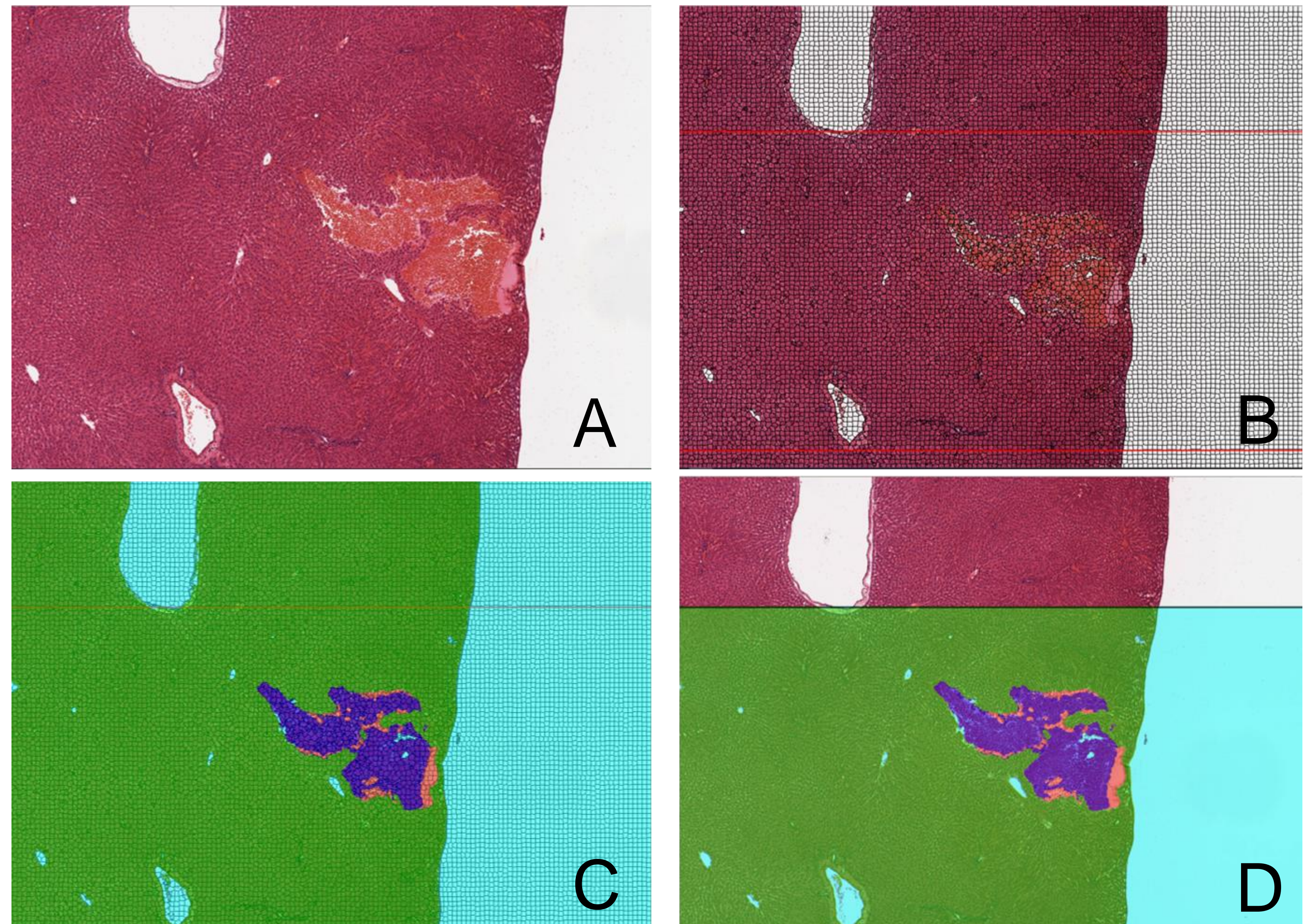
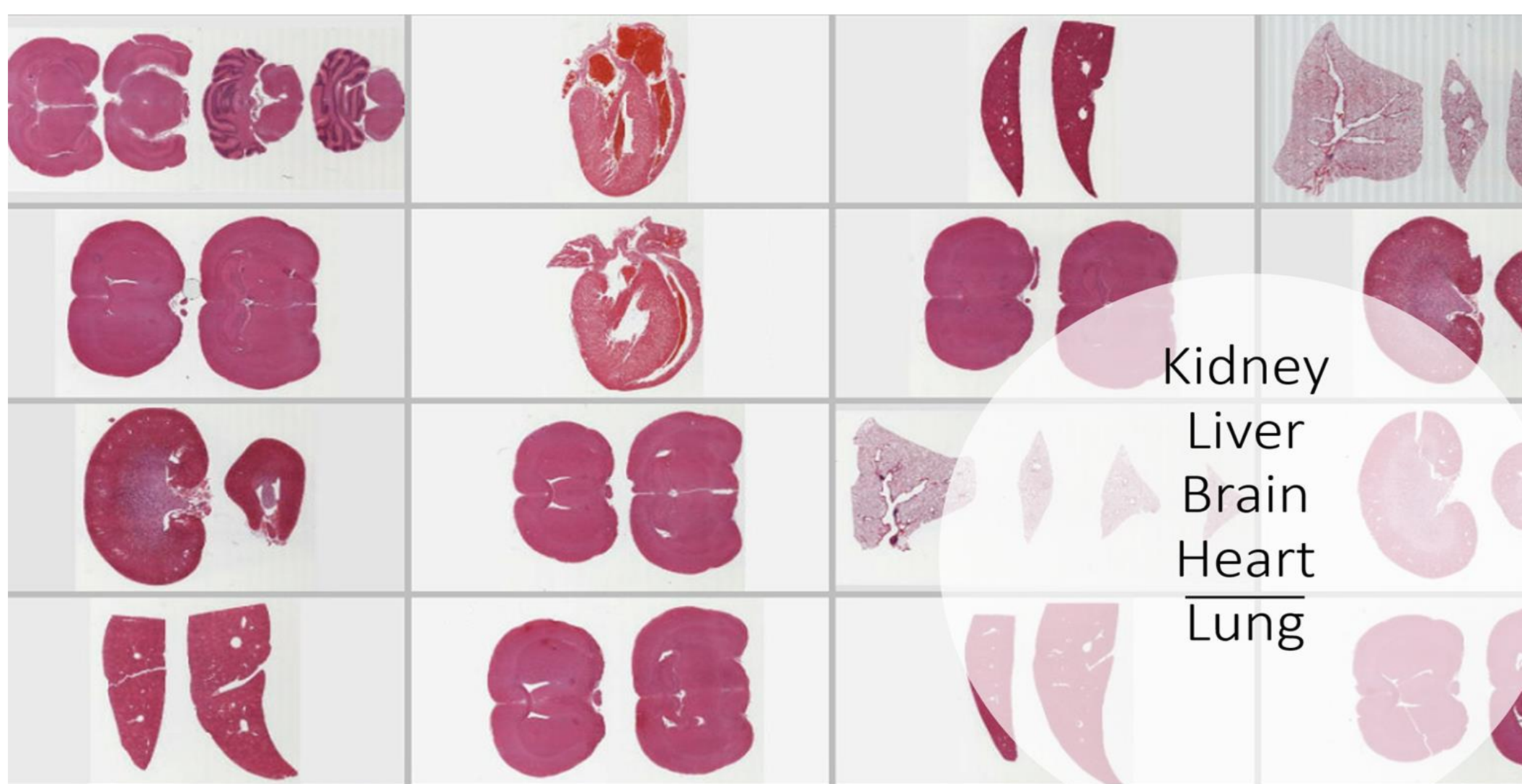


Figure 1. A) Liver tissue with observed lesion. B) Super pixel segmentation approach to train classifiers. Once classifier is trained on several pixels, this can be applied across the slide. C) Detection of variant tissue types and colour annotation. D) Mask viewer applied to selected tissue region.

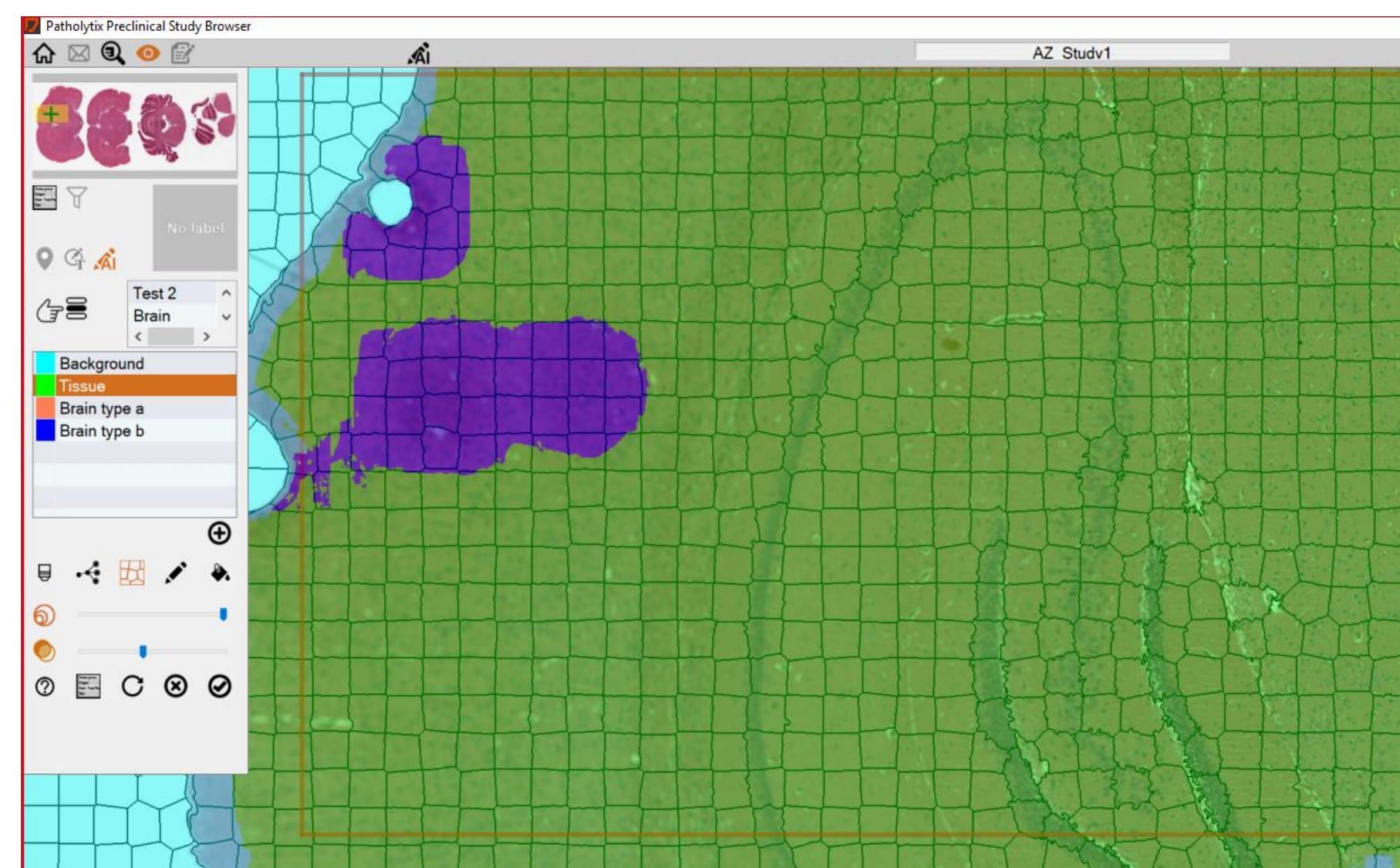


Data collection

7300 slides

140 studies

5 different organs

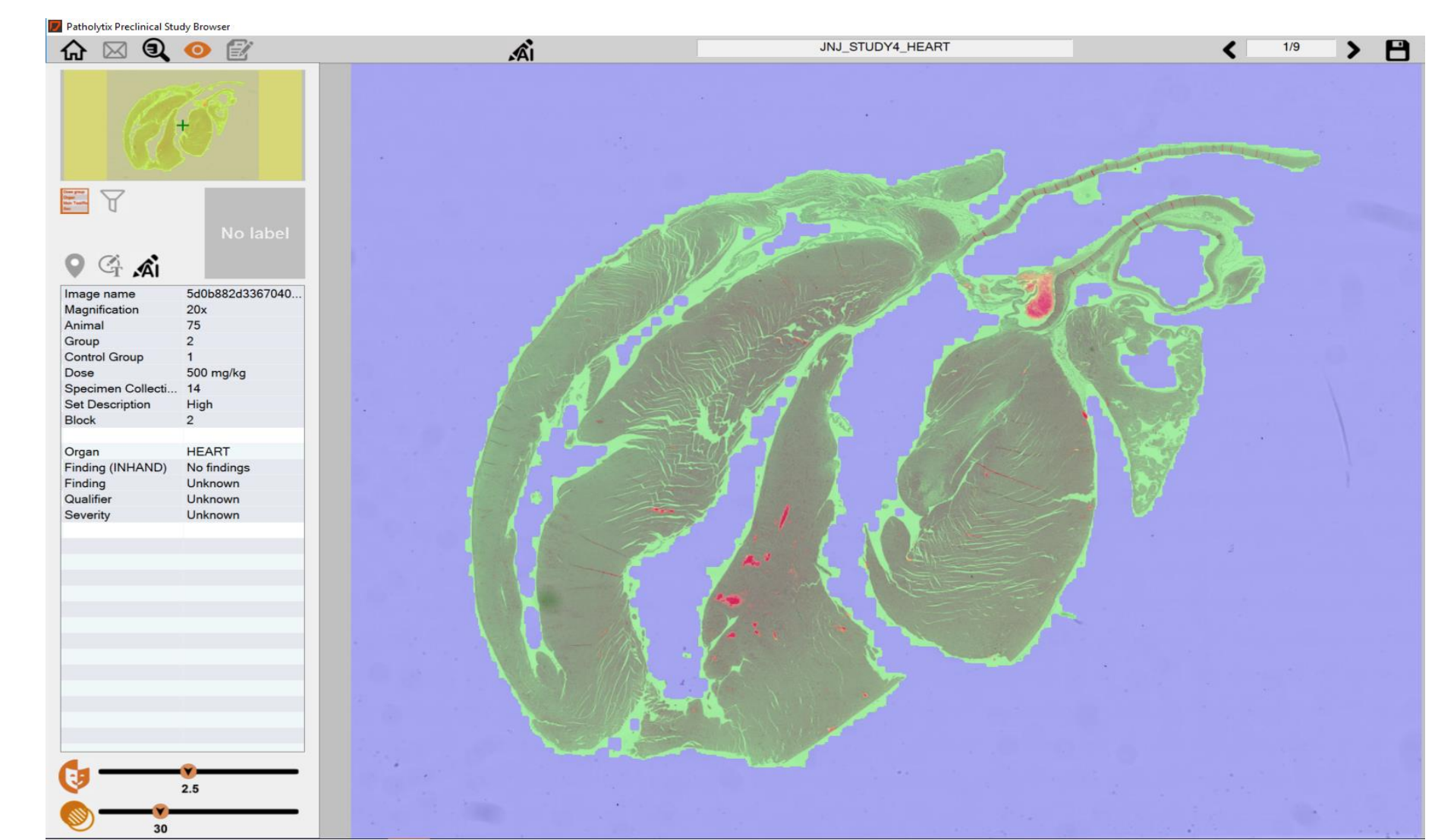


Data annotation

Annotation interface

Centralized storage

Region based annotations



Validation

Centralized dataset

Automated calculations

Ground truth regions of interest

Results

A variety of datasets were **standardized and aggregated** using the standard finding notations. The approach described is an important predicate to larger initiatives to develop and quantify **AI performance in large scale** in preclinical toxicologic studies. To further increase the number of datasets available to training and evaluation of the AI algorithms, we are participating in a large scale multi-industry initiative with the aim to provide a **large consolidated repository** for rapid automatic anomaly detection and classification.

