HISTOLOGICAL AND IHC CHARACTERIZATION OF CHRONIC BURN WOUNDS IN GÖTTINGEN MINIPIGS (GMP)
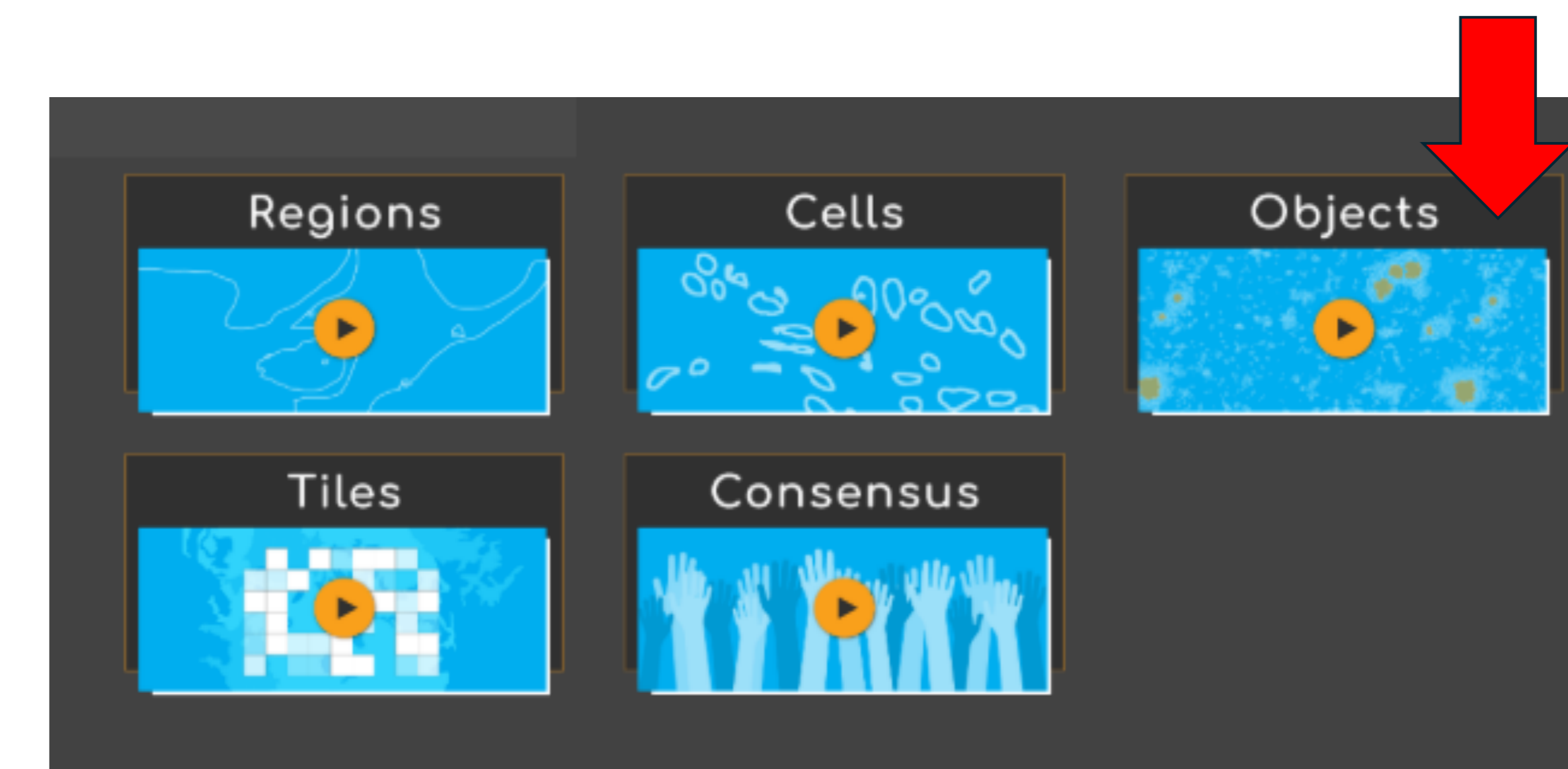
Avital Schauder, Stephanie Oren, and Sigal Meilin

MD Biosciences Innovalora Ltd.

Study Outline

Model: Burn wounds in female Göttingen minipigs

Wound Formation: Heated metal (137-139°C) was placed on the skin for 20 seconds, and six burn wounds were created on the back of each animal. Animals were terminated after 35 or 90 days.

Tissue Collection for Histology: Upon termination, the burn area and the surrounding healthy skin were harvested, and the middle of the tissue was cut for various stainings.
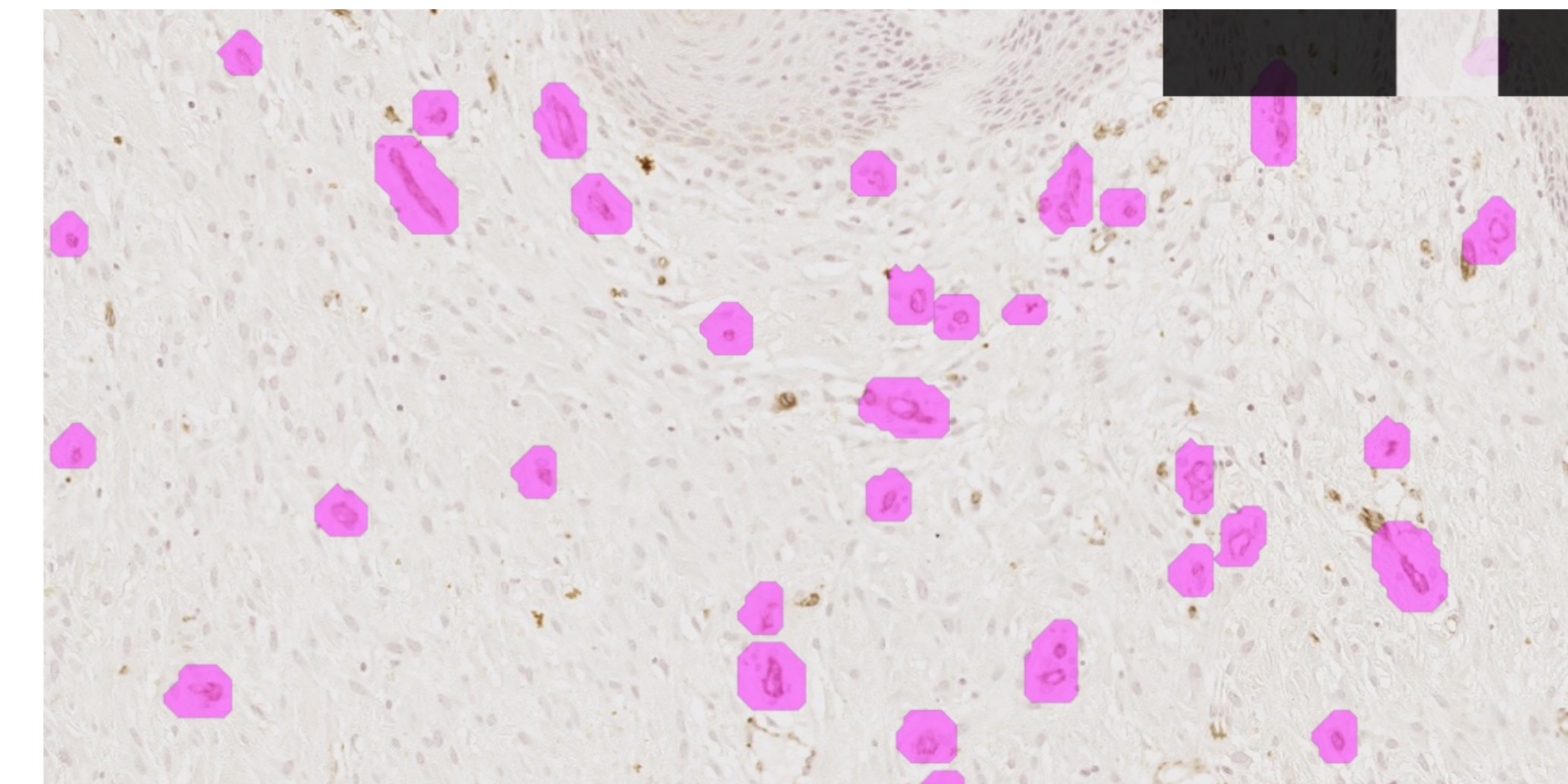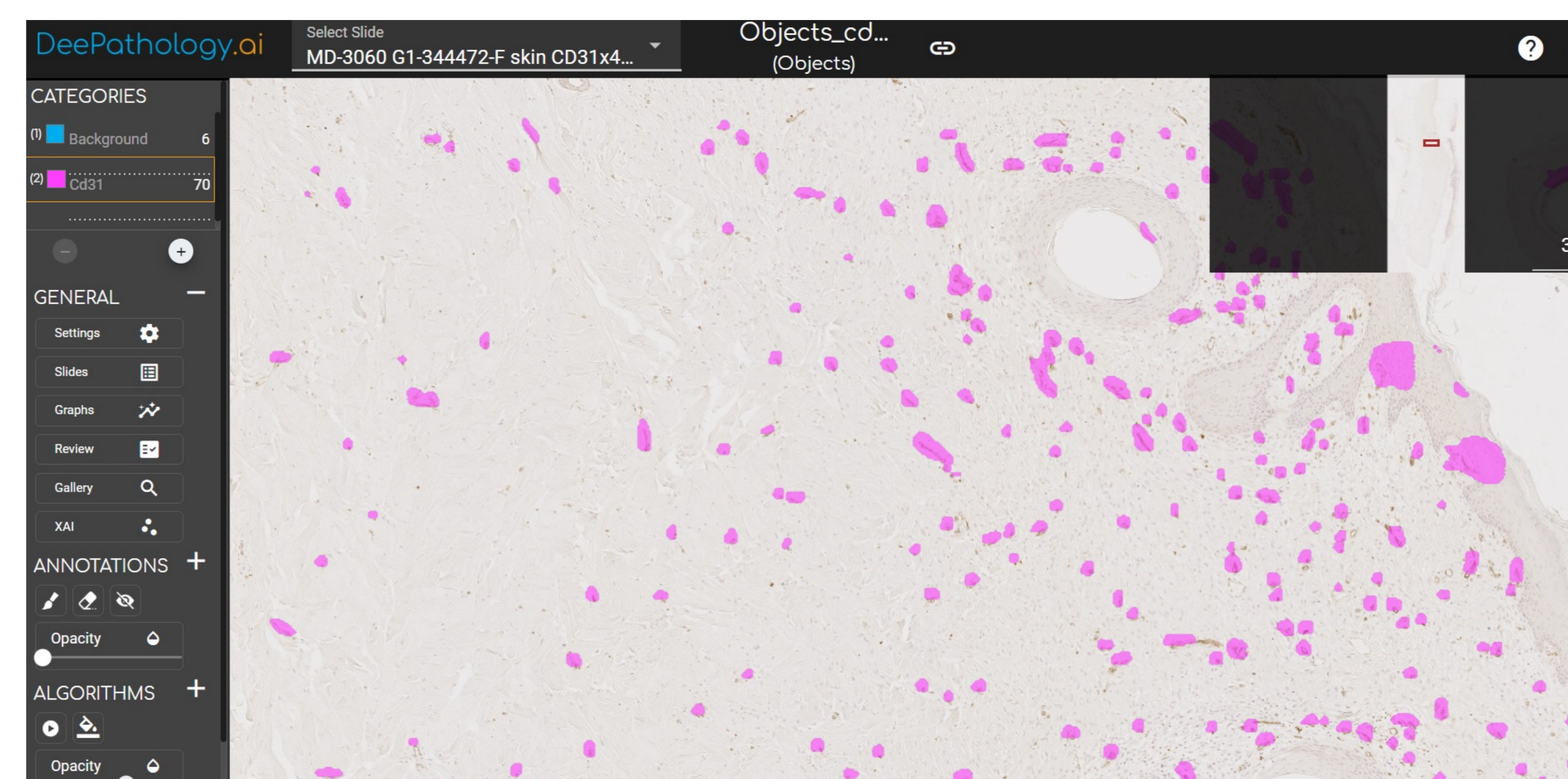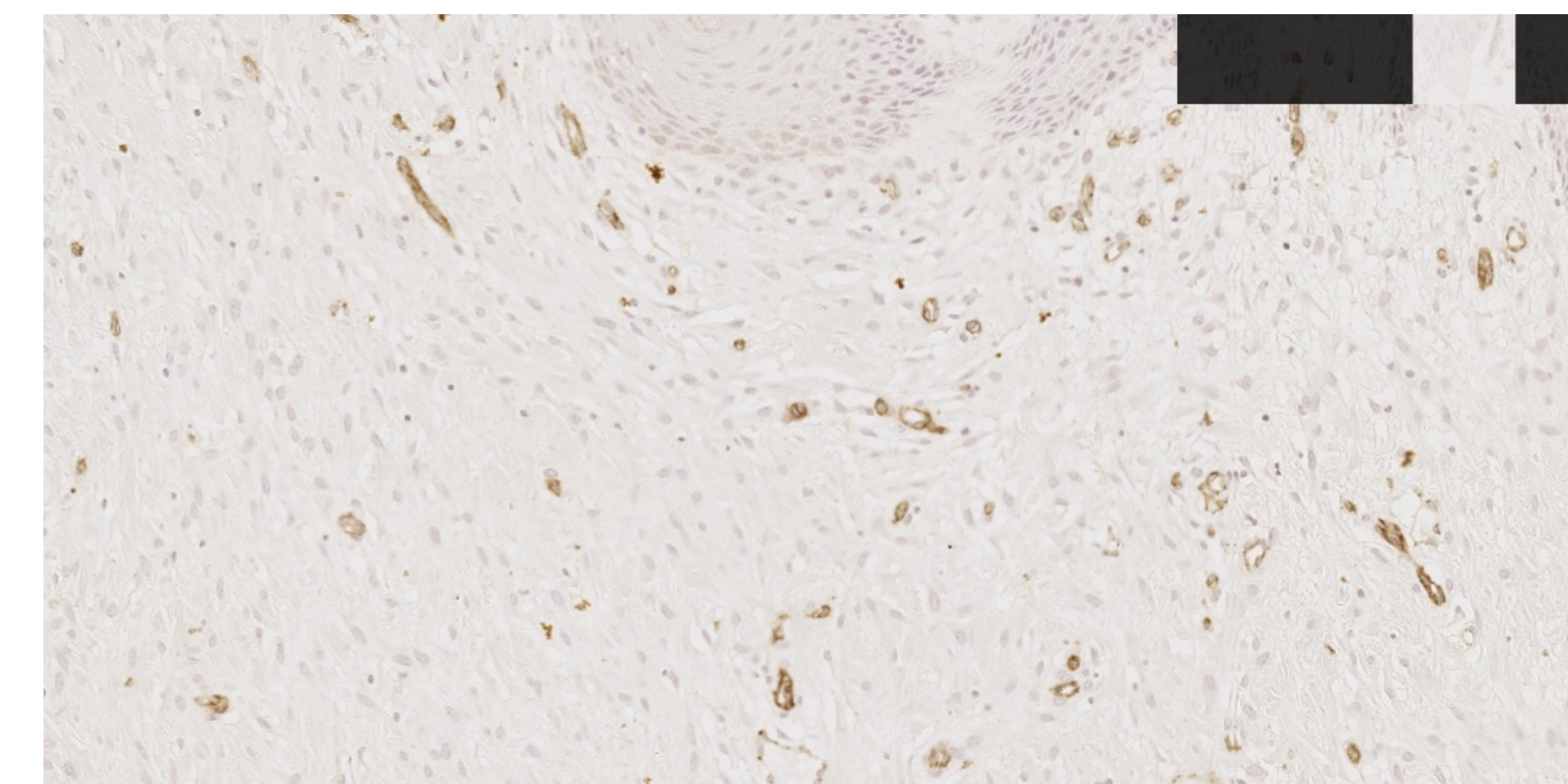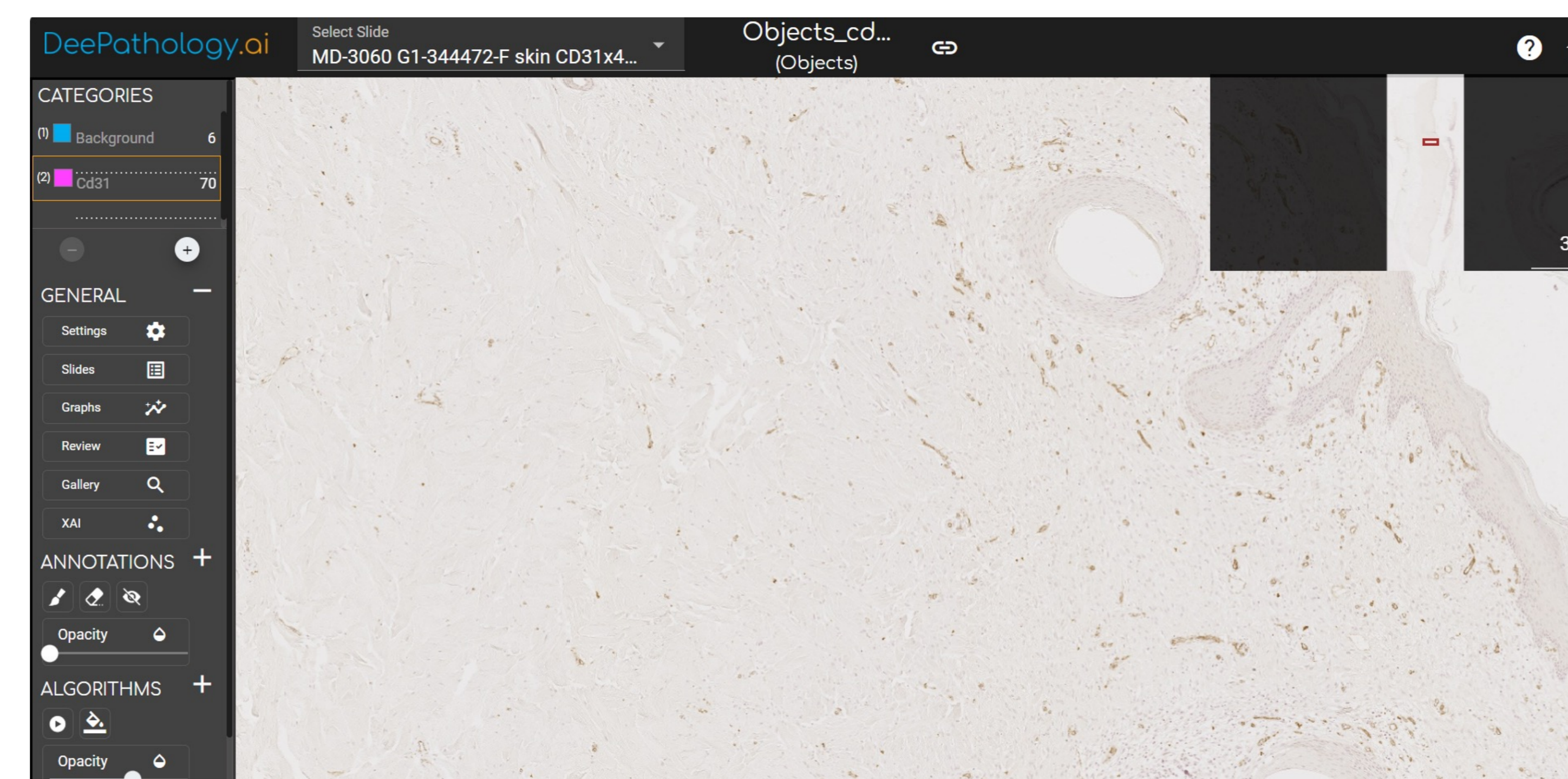
Staining Methods

- **H&E**
- **Masson Trichrome**
- **IHC (CD31):** newly formed blood vessels (in granulation tissue)
- **Herovici:** method for differentiation between mature collagen and freshly-formed collagen
- **IENF:** intraepidermal nerve fibers

Artificial-Intelligence (AI)-based software (DeePathology® STUDIO) was trained for identification and quantification of blood vessels (IHC for CD31).

- **Analysis Mode: Objects**
- Positive staining (brown chromophore)
- Size: several to multiple cells in round/oval/elongated shape
- Resolution: magnification x7
- Identification of background
- No overlap between objects
- Normalization: Tissue size
- State-of-the-art deep learning for instance segmentation
- **Rapid training of the algorithm (minutes) with fast and accurate analysis**

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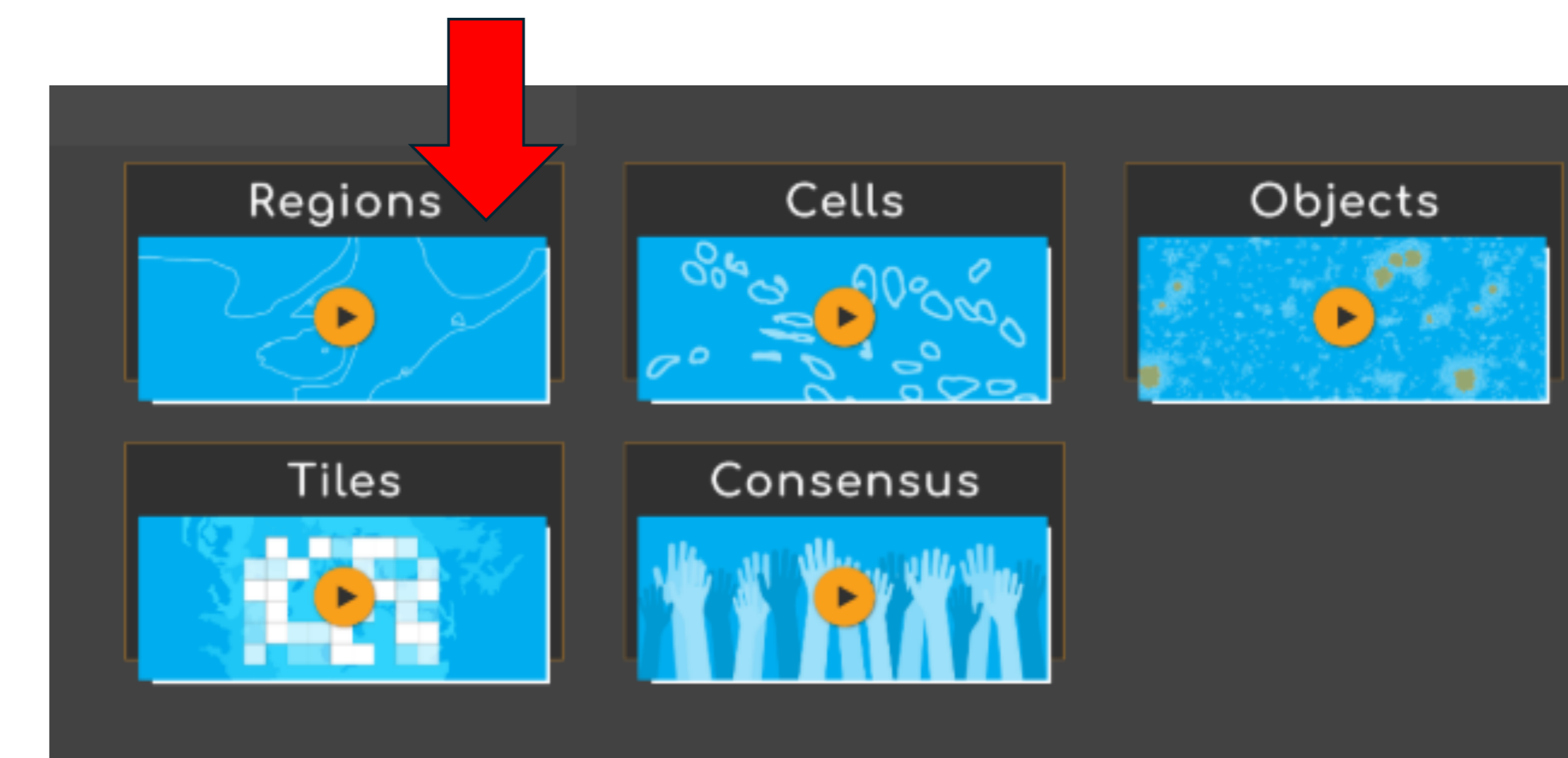
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Staining Methods

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Artificial-Intelligence (AI)-based software (DeePathology® STUDIO) was trained for identification and quantification of mature vs. freshly-formed collagen, which was analyzed at the dermis layer (Herovici staining).

- **Analysis Mode: Regions**
- Main colors: red (mature collagen), blue (freshly-formed collagen)
- Size: collagen fibers (larger than cells)
- Resolution: low
- Identification of background: epidermis
- Normalization: tissue size (dermis layer)
- State-of-the-art deep learning and fine-tuning of pre-trained DeePathology models
- **Rapid training of the algorithm (minutes) with fast and accurate analysis**