FibroNest: Single-fiber, High Content Digital Pathology and AI

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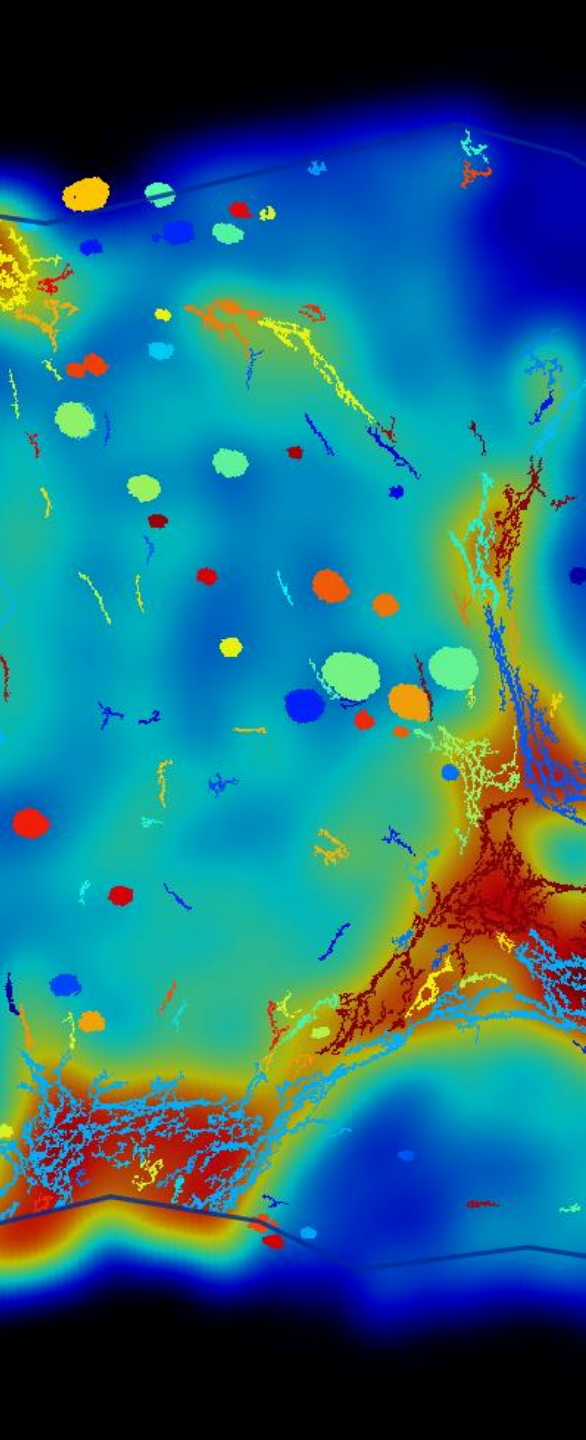
About the FibroNest method

- ❑ **Same Slide(s) as Pathologist**

- ❑ **High content |Single Fiber / Nuclei**

- ❑ **AI > large quantitative & Relevant data-lakes**

- ❑ **Fully translational, not trained in existing paradigms**

- ❑ **1 Phase 3, 6 Phase 2 NASH, 3 Phase 2 in other Fibrotic conditions, 60+ preclinical studies**
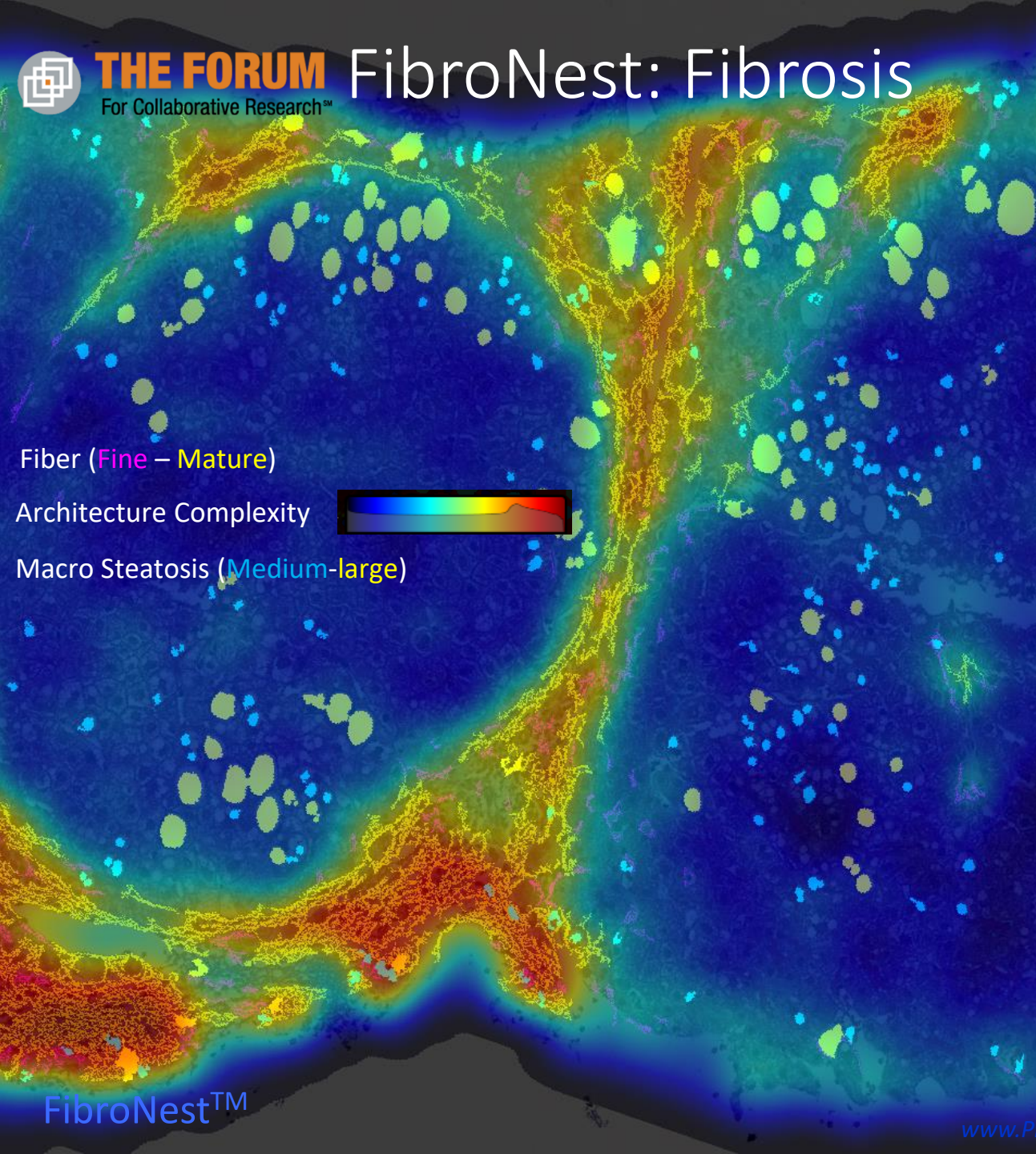
FibroNest: Fibrosis and Inflammation

Fiber (Fine – Mature)

Architecture Complexity

Macro Steatosis (Medium-large)

FibroNest™

Normal Hepatocyes
Steatosis Hepatocytes
Inflammatory Cells
Specialized Cells
Q2-2022
Glycogenotic Nuclei
Acidophilic Bodies
Megamitochondria
Q2-2023
Stellate Cells
FibroBlasts

www.Pharmanest.com

Phenotypes of Fibrosis

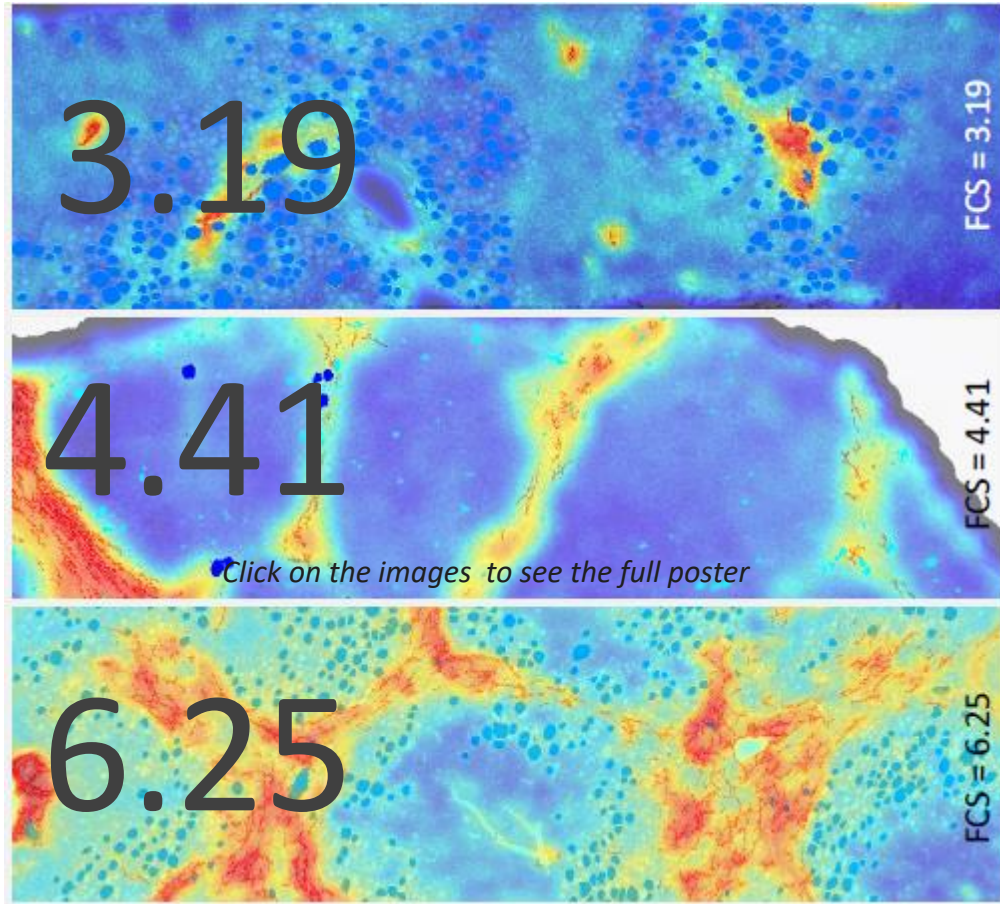# Phenotypes of Fibrosis

Opportunity

Opportunity

Opportunity

Fiber Density (Faint-Mature)

Architecture Complexity

Macro Steatosis (Medium-large)

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FibroNest quantifies Response to Treatment
(Aramchol, NCT02279524)

Biopsy methodology	Post-BL Biopsy at <W48 weeks		Post-BL Biopsy at ≥ W48	
	N	%	N	%
All	28	100%	23	100%
Fibrosis Improvement (1 point or more) based on NASH CRN	7	25%	9	39%
Fibrosis Improvement (Paired reading ranked assessment) based on comparing individual patients slides	12	43%	14	61%
Subject Fibrosis Response (AI reading) using Fibronest's Phenotypic FCS (A responder is defined by an absolute reduction of > 0.3)	15	54%	23	100%
Subject Fibrosis Response (AI reading) using Fibronest's Phenotypic FCS (A responder is defined by a relative reduction of 25%)	6	21.4%	15	65.2%

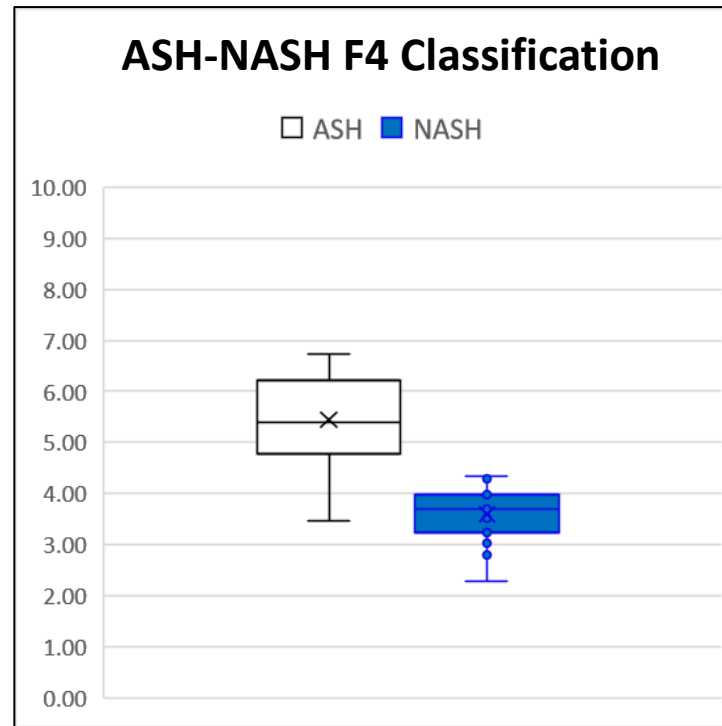*Click on the images to see the full poster*

FibroNest Parenchymal continuous Resolve paired-biopsy drug effect "inside Categorical Scores" and decouples anti steatosis from anti-fibrotic dynamics
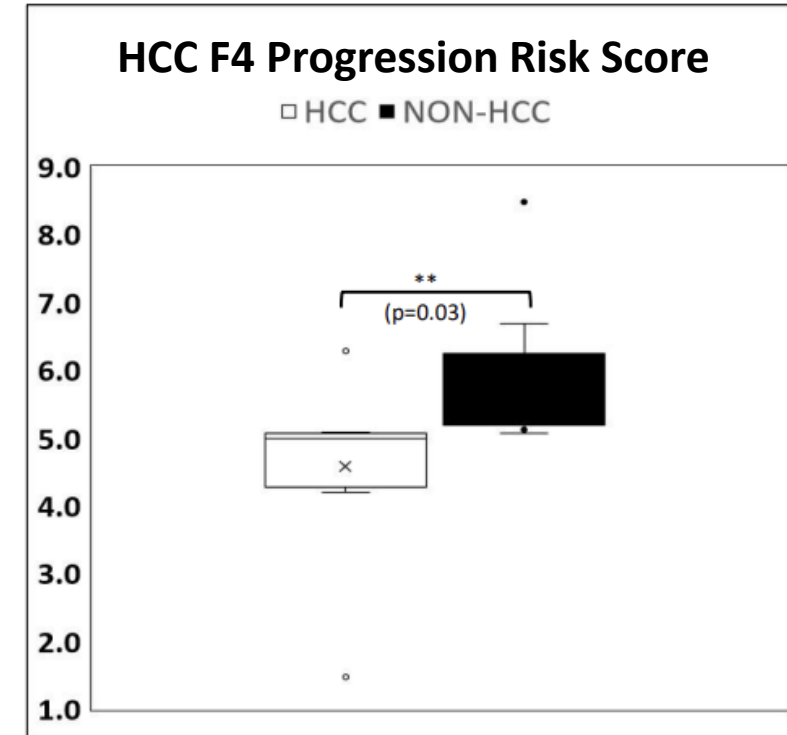
FibroNest : Digital pathology AI | Cirrhosis Spectrum

F4 Phenotypes

F4 Sub phenotyping
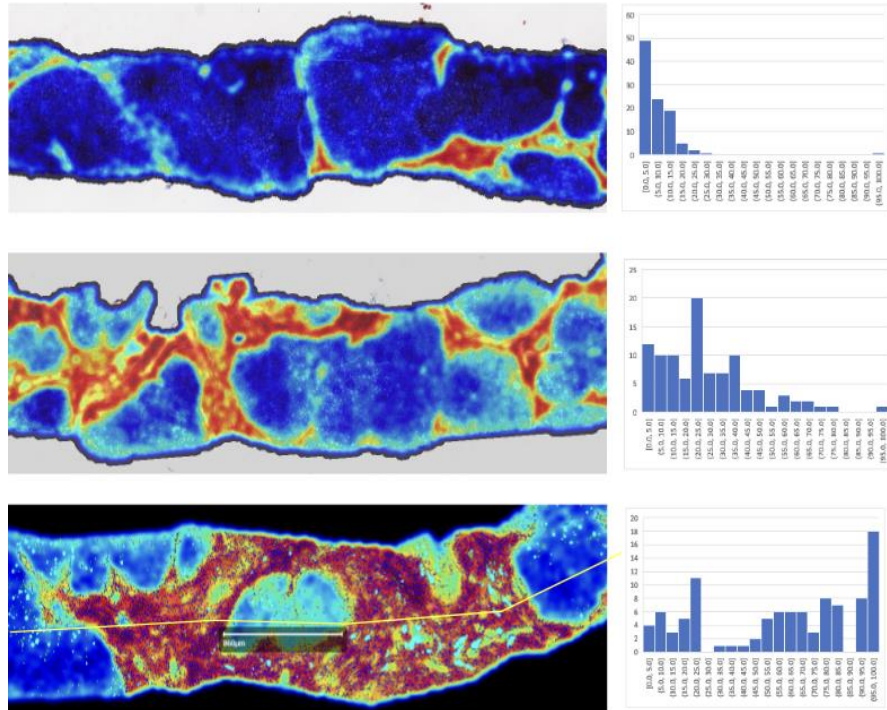
F4 Outcomes Prediction

- Septal Region Morphometry
- Lobular Tissue Morphometry
- "Scar" Phenotypic Score to balance Tissue Injury and Tissue Regeneration
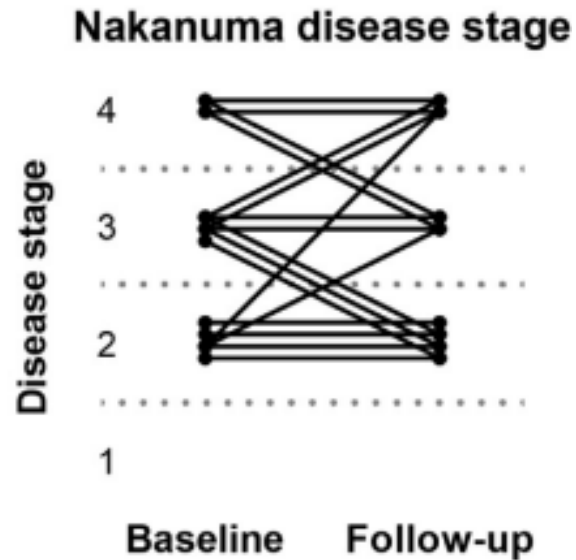
- ASH-NASH
- LAENNEC (WIP)

- HHC progression
- Clinical Outcomes Prediction (WIP)

Automated Fibrosis Phenotyping of NASH non-tumorous lesions Digital Images Helps Classify HCC and non-HCC NASH patients who underwent liver transplantation. Hisamitsu Miyaaki1, Yuko Akazawa1 , Li Chen2, Mathieu Petitjean2 (1) Nagasaki University, Nagasaki, Japan (2) PharmaNest, Princeton, NJ, USA. ASH-NASH sub-phenotyping (Under Publication) Presented at AASLD 2020 (Poster here)

FibroNest : Digital pathology AI | PBC

Christopher L. Bowlus,* Paul J. Pockros,‡ Andreas E. Kremer,§ Albert Parés,||
Lisa M. Forman,¶ Joost P. H. Drenth,# Stephen D. Ryder,** Luigi Terracciano,‡‡
Yuying Jin,§§ Alexander Liberman,§§ Richard Pencek,§§ Uche Iloeje,§§
Leigh MacConell,§§ and Pierre Bedossa||||

Histological Parading Responders

Nakanuma disease stage
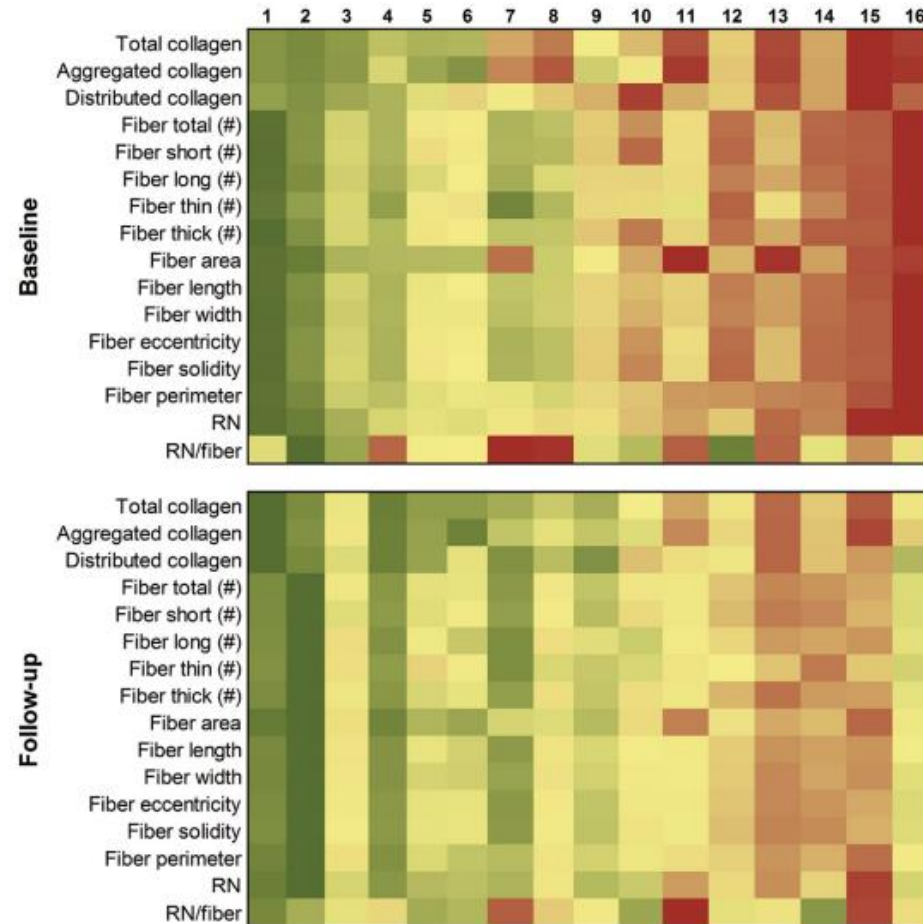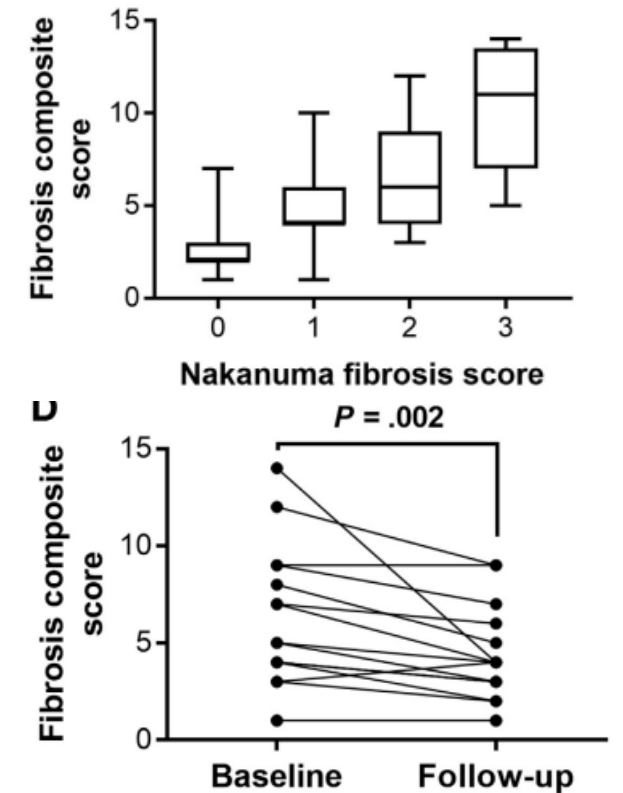
Improved: 5 (29%)
Remained stable: 8 (47%)
Worsened: 4 (24%)

Fibrosis Single Fiber Phenotyping

POISE Study – OCA in PBC patients (N=17)

Continuous Scoring Response

$P = .002$
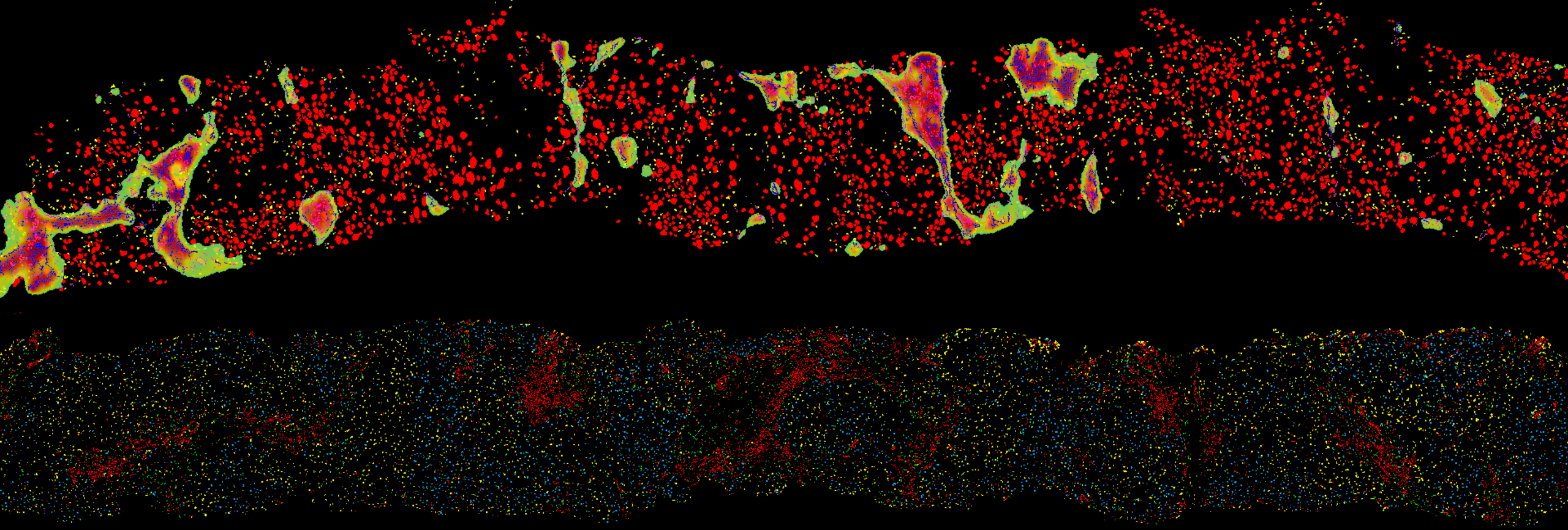
25% Mean change from baseline
51% responders

PSC Opportunity

- ❑ **Histological Phenotype Fibrosis**

- ❑ **Continuous scores for**
  - ➤ **Fibrosis Severity**
  - ➤ **Progression risk**
  - ➤ **Phenotypes of treatment response**

- ❑ **Unsupervised ML. No need for annotations**

- ❑ **Same stained slides as pathologists**

- ❑ **N=20 for POC**

Thank You !

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