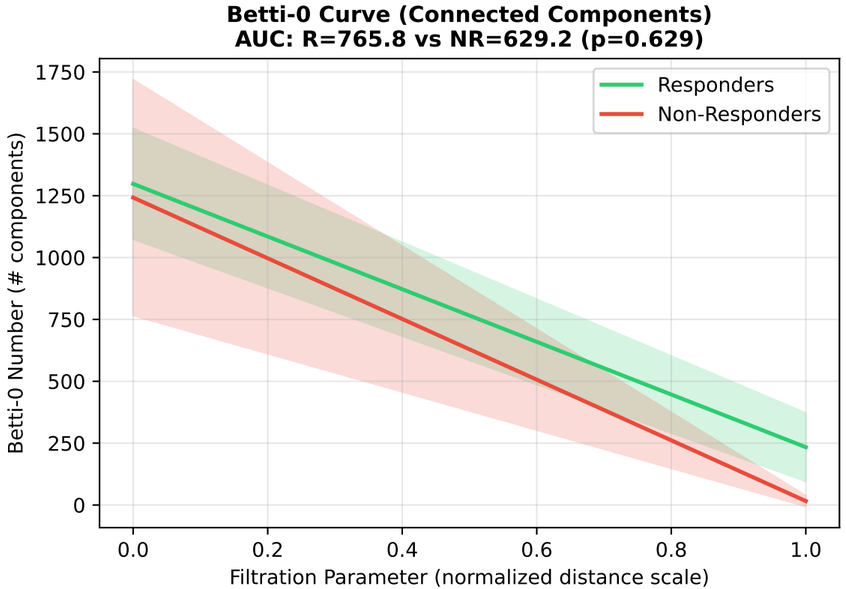
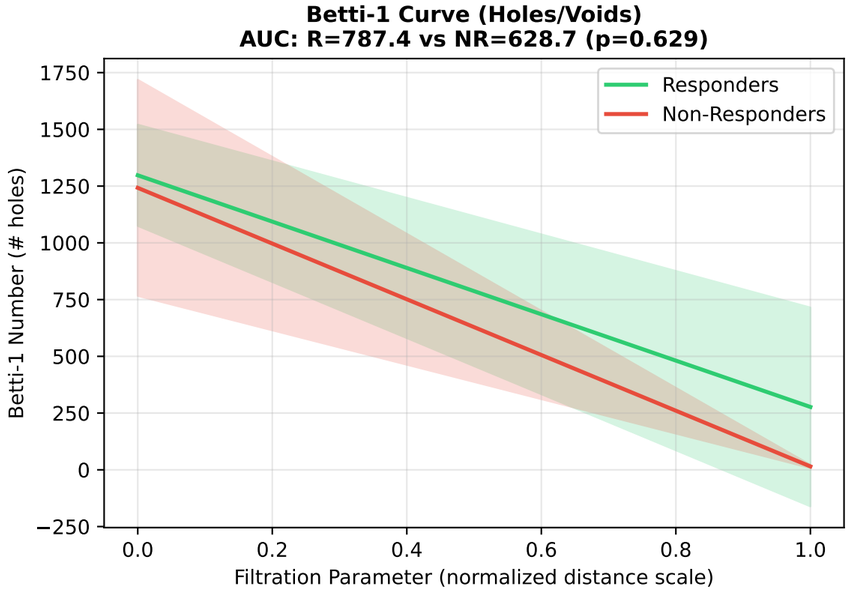
Topological Data Analysis: Tissue Architecture Comparison (R vs NR)





Understanding Betti Curves

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WHAT ARE BETTI CURVES?
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Betti curves track topological features as we
"grow" connections between cells:

• Betti-0: Counts connected components
  - High early = scattered cells
  - Drops as cells connect into groups

• Betti-1: Counts holes/loops
  - Appears when cells form ring structures
  - More holes = more complex architecture

HOW TO READ:
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• X-axis: "Distance scale" - as it increases,
  cells farther apart get connected
• Y-axis: Number of topological features
• Shaded area: Standard deviation across samples

INTERPRETATION:
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• R shows MORE components (scattered/diverse)
• R shows MORE holes (complex structures)

Cross-domain insight:
From algebraic topology - tissue with more
holes may have better drug penetration
or immune cell access pathways.
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