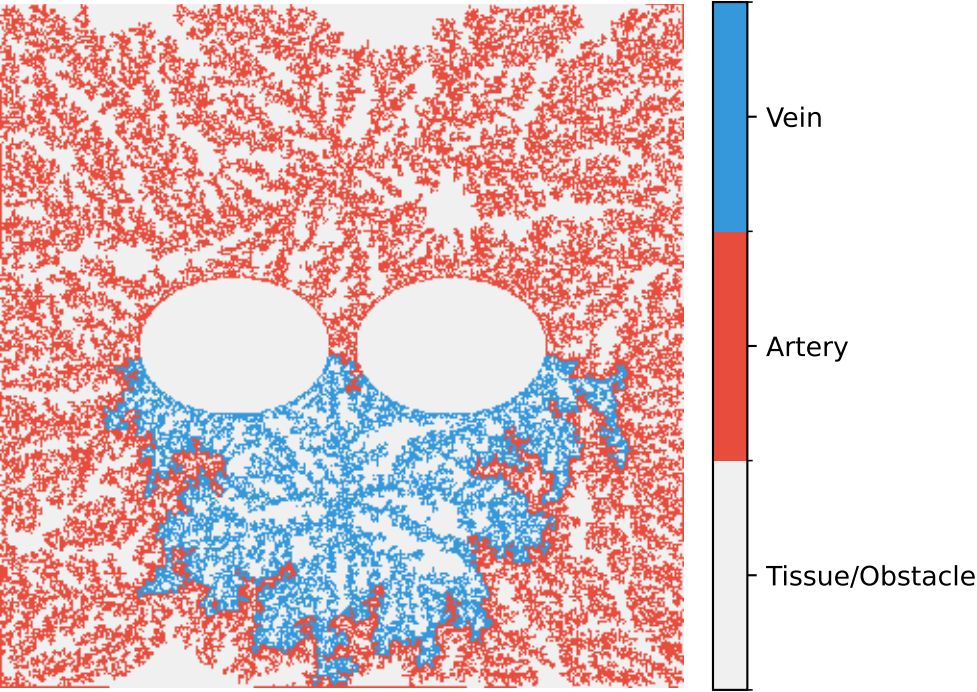
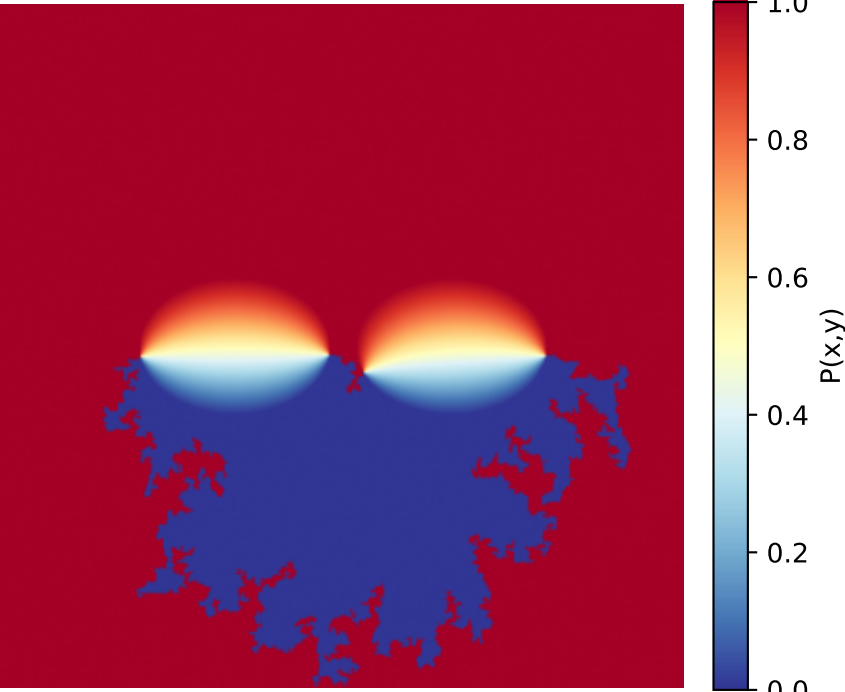


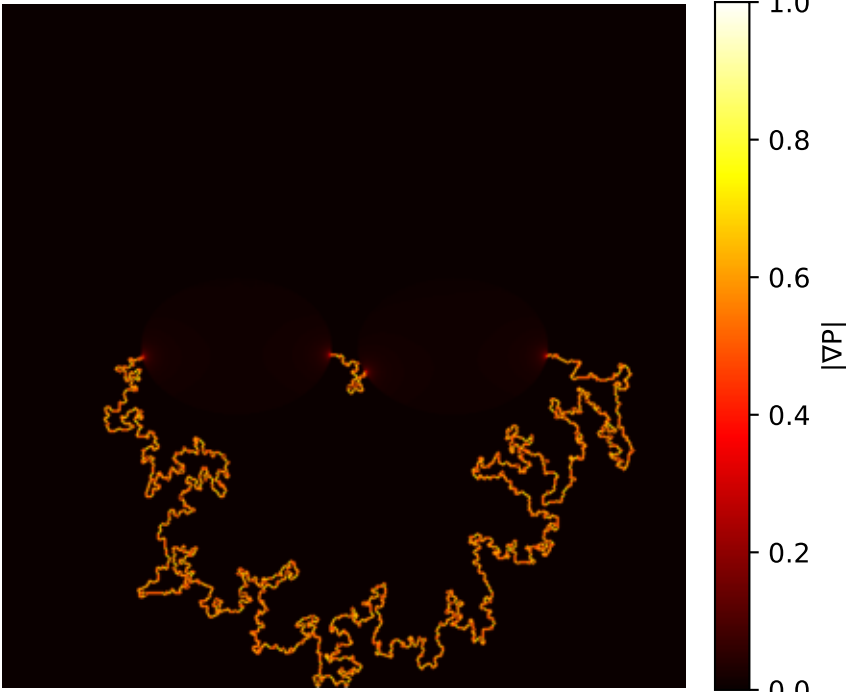
Final Vascular Structure
(Red: Artery, Blue: Vein)



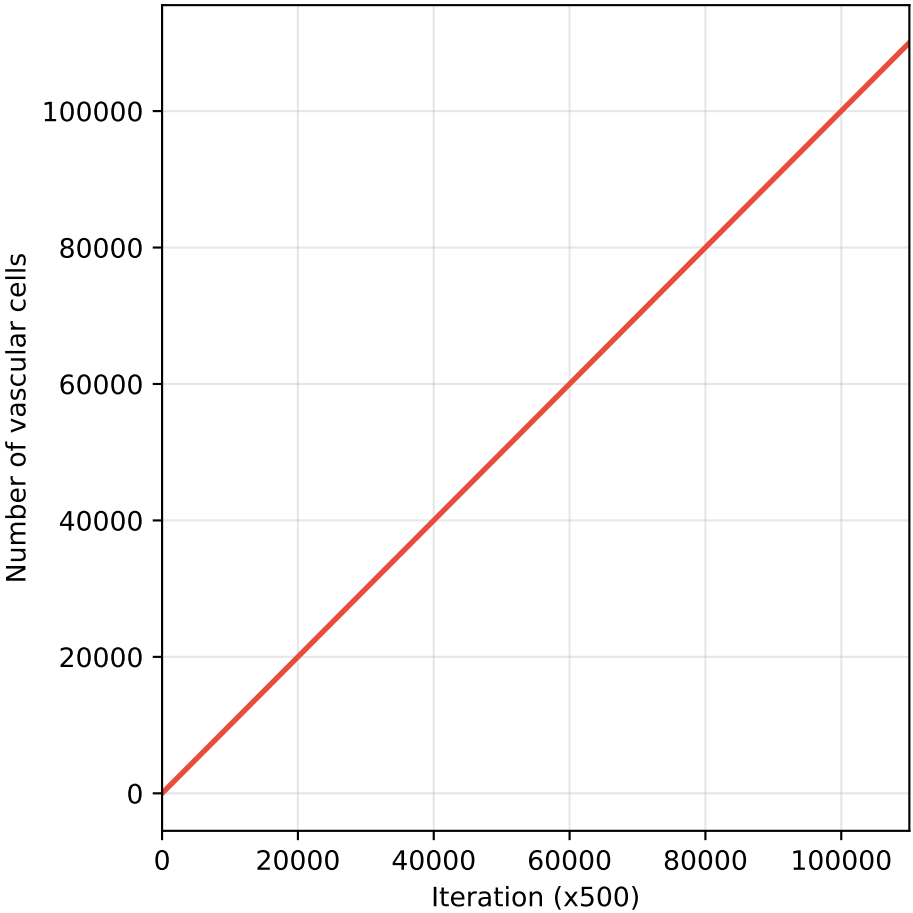
Final Pressure Field
($\nabla^2 P = 0$, BC: Neumann)



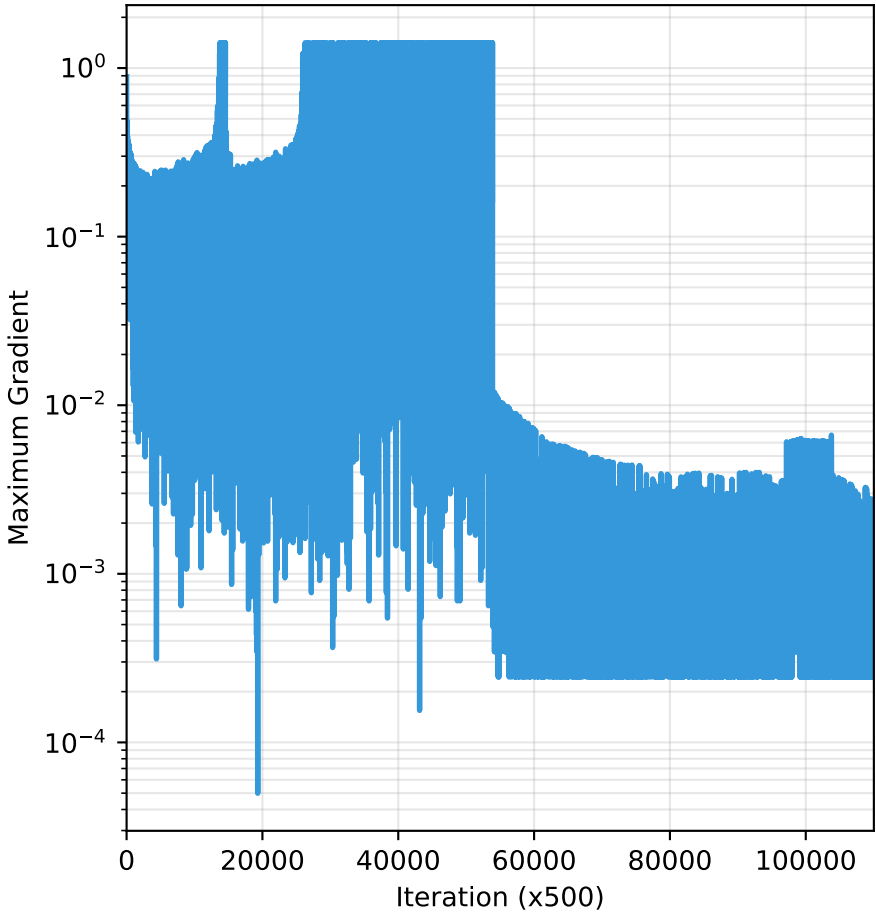
Magnitude $|\nabla P|$
(shear stress)



Vascular Network Growth



Pressure Field Dynamics



```
MODEL CONFIGURATION
Grid: 512x512
Backend: CUDA (GPU)
Equation:  $\nabla^2 P = 0$  (Laplace)
Boundary Conditions:
  •  $P = 1.0$  (arteries)
  •  $P = 0.0$  (veins)
  •  $\nabla P \cdot n = 0$  (Neumann)
Obstacles:
  • Two internal ellipses (left/right) with central gap
Growth Prob.:
   $p_i \propto |\nabla P|^{1.5}$ 
Type rule (original):
  • New vessel copies type of neighbor with max P
Statistics:
  Iterations: 110027
  Vessels: 110029
  Fraction: 41.97%
  Time: 4567.96s
  Speed: 24 iter/s
```