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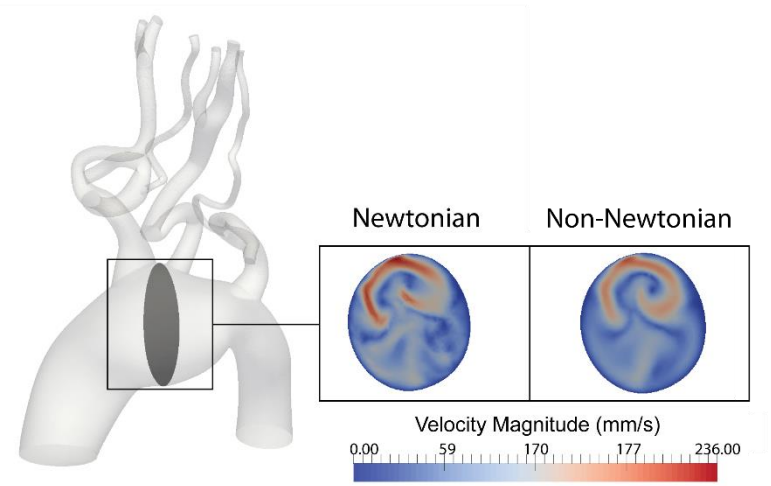
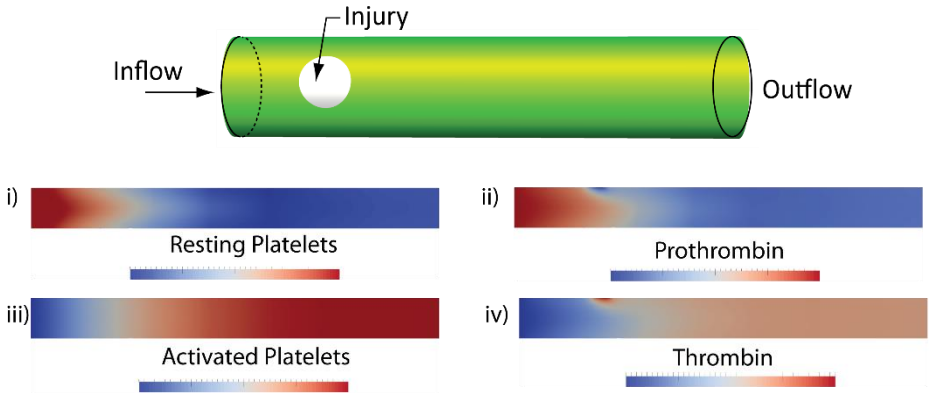
Parallel Image-Based FEM flowsolver

CRIMSON

$$\rho\left(\frac{\partial v_i}{\partial t} + \boldsymbol{v}\cdot\nabla\boldsymbol{v}\right) = -\nabla P + \mu\nabla^2\boldsymbol{v} + \rho\boldsymbol{f}, \nabla\boldsymbol{v} = 0$$

$$\frac{\partial c_i}{\partial t} + \nabla\cdot(-D_i\nabla c_i) = R_i - \boldsymbol{v}\cdot\nabla c_i$$





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Challenges

- Coupling Python interface to Fortran subroutines
- Computation efficiency
- Data Visualization

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$$\frac{\partial c_i}{\partial t} + \nabla\cdot(-D_i\nabla c_i) = R_i - \boldsymbol{v}\cdot\nabla c_i$$

$$R_i = k_i c_i + k_{mi} c_m c_i + k_{ii} c_{i2}$$