Development of novel 3D MND model by use of aligned polymer fibre scaffolds

Candy Ho
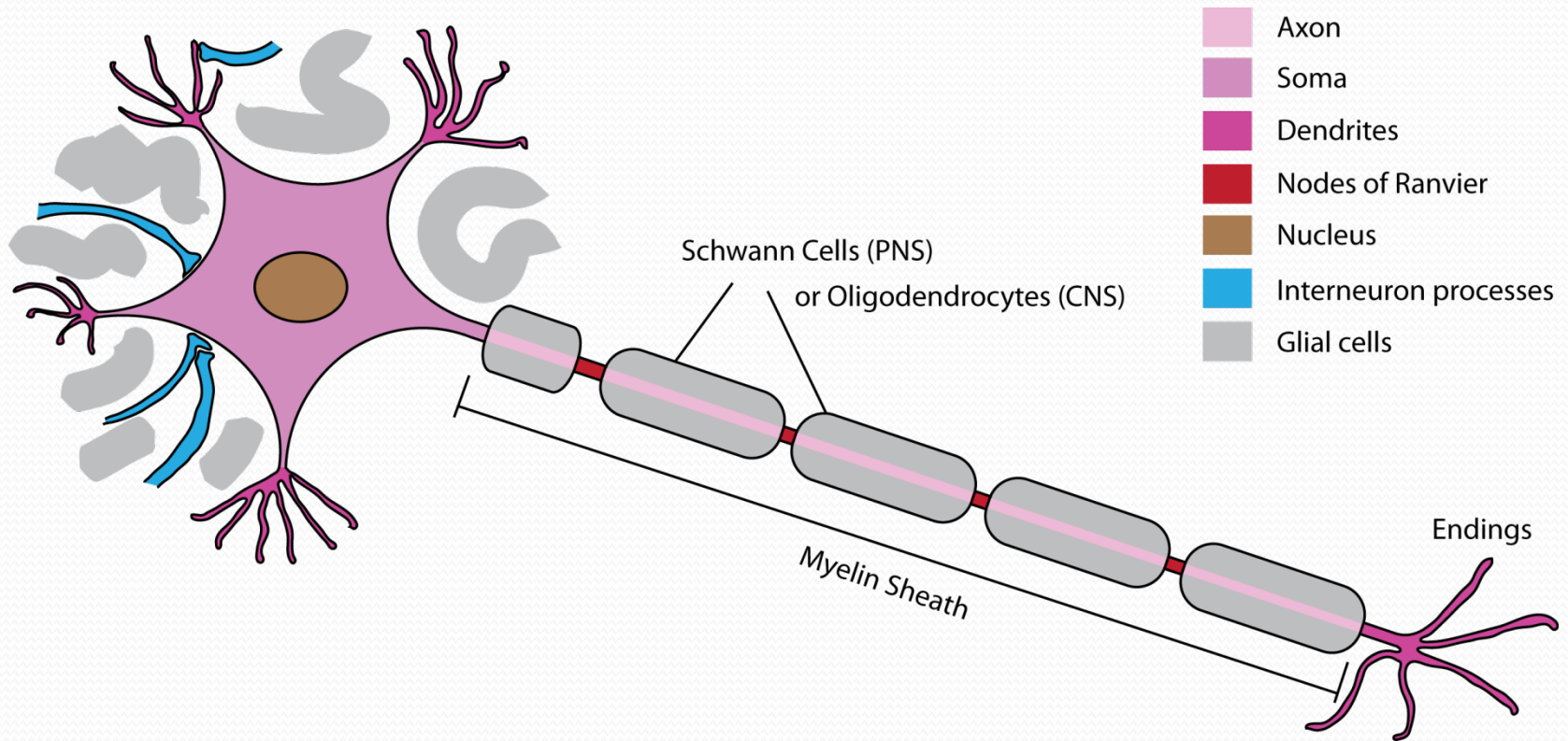Supervisors:
  Prof. J. W. Haycock (Tissue Engineering),
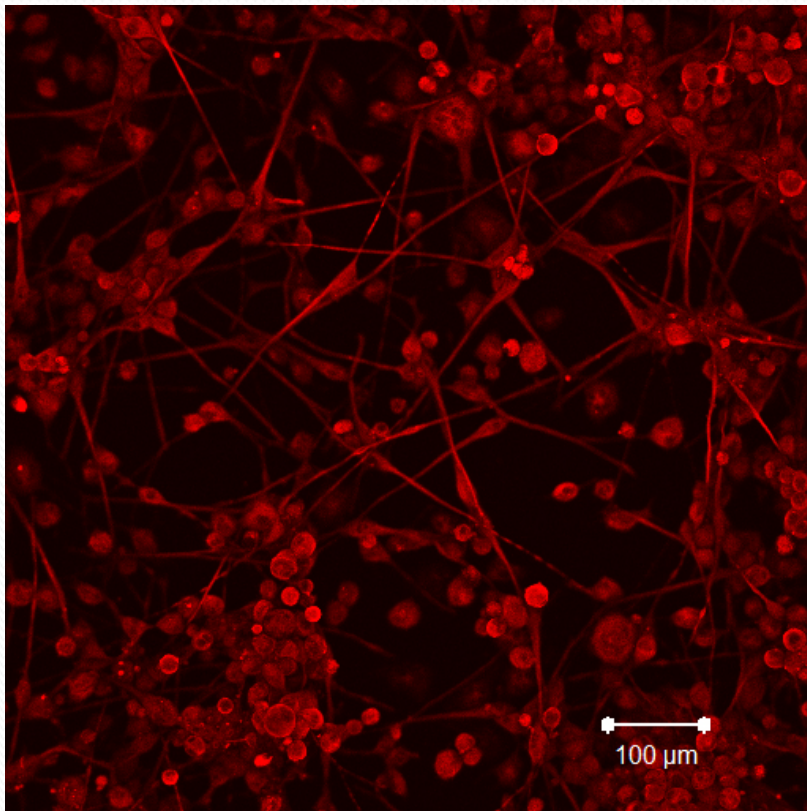 Dr. K. Ning (Neuroscience)
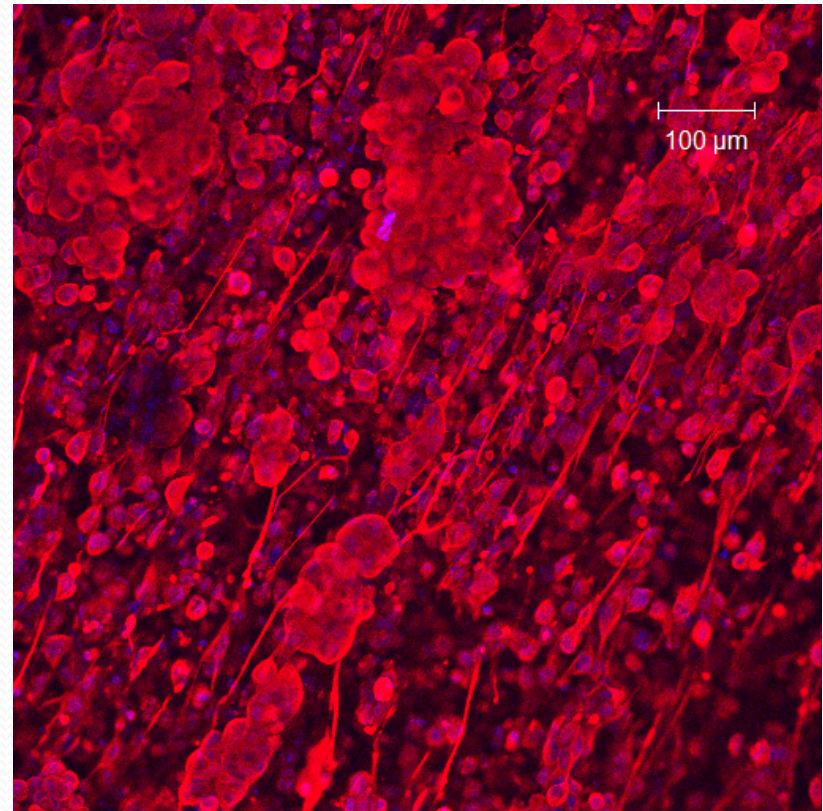 Prof. P. Shaw (Neuroscience)

Mammalian Nervous Motor System

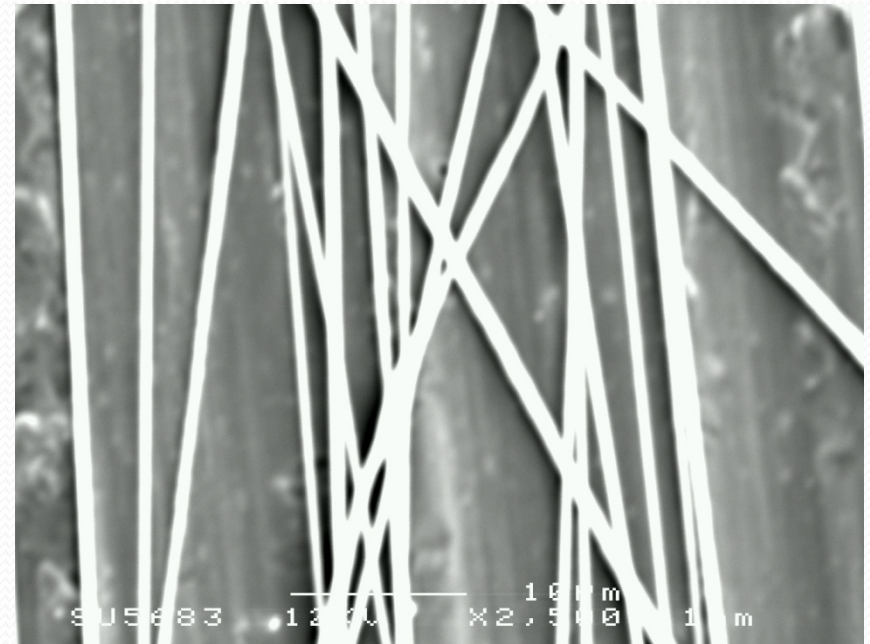# Neurite Growth

In standard cultures

Controlled Growth
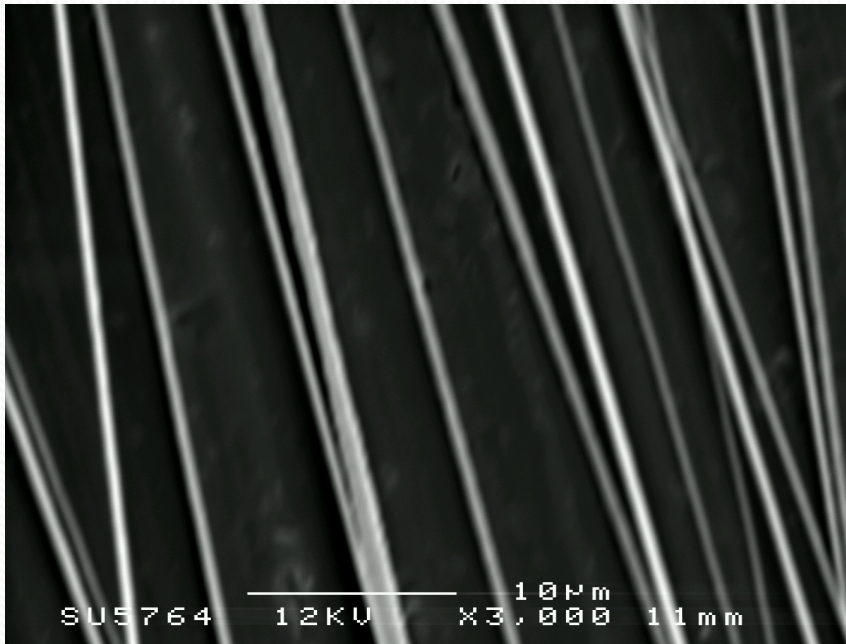
Scaffold Alignments
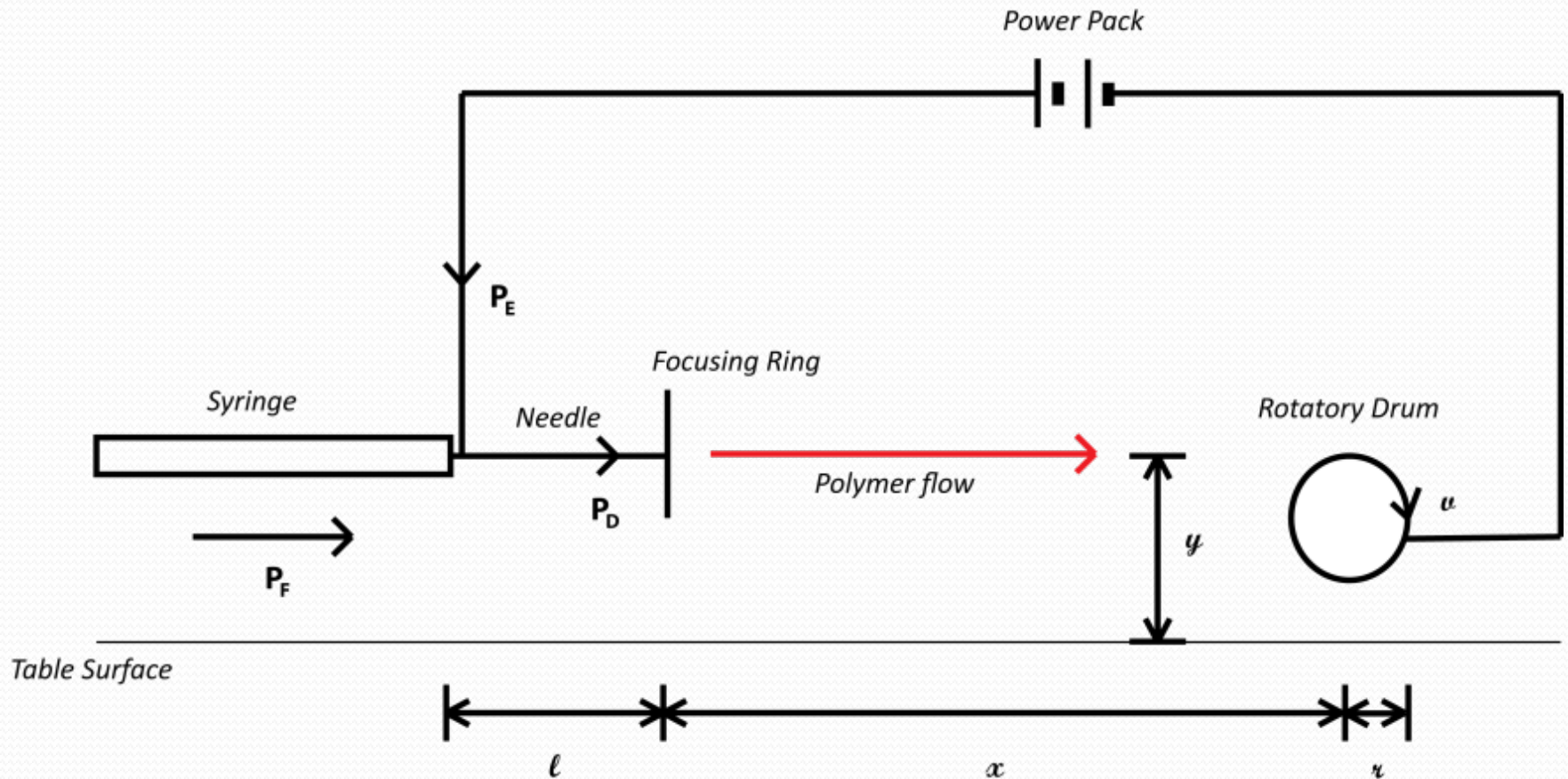
Aim   **Avoid**

Theory of Electrospinning (Simple)

Theory of Electrospinning - Extended

Physical

- Viscoelastic instability
  - Solution viscosity
  - Modulus of polymer
  - Stress of solution
  - Surface tension
- Coulombic instability
  - Conductivity of solution
- Electric field
- Flow Rate

Environmental

- Air Friction
  - Relative humidity
  - Air density
  - Air viscosity
- Conductivity of air
  - Relative humidity
  - Temperature
  - Free ions

How will FLAME help?

- Improve batch consistencies

  - Quicker generation of optimal parameter combinations for desired scaffold designs

  - Better control of uncontrollable/costly to control parameters.

  - Decreases manufacturing costs

Thank you!