Adult Stem Cells for Chronic Pain

Dr. John Hughes, DO

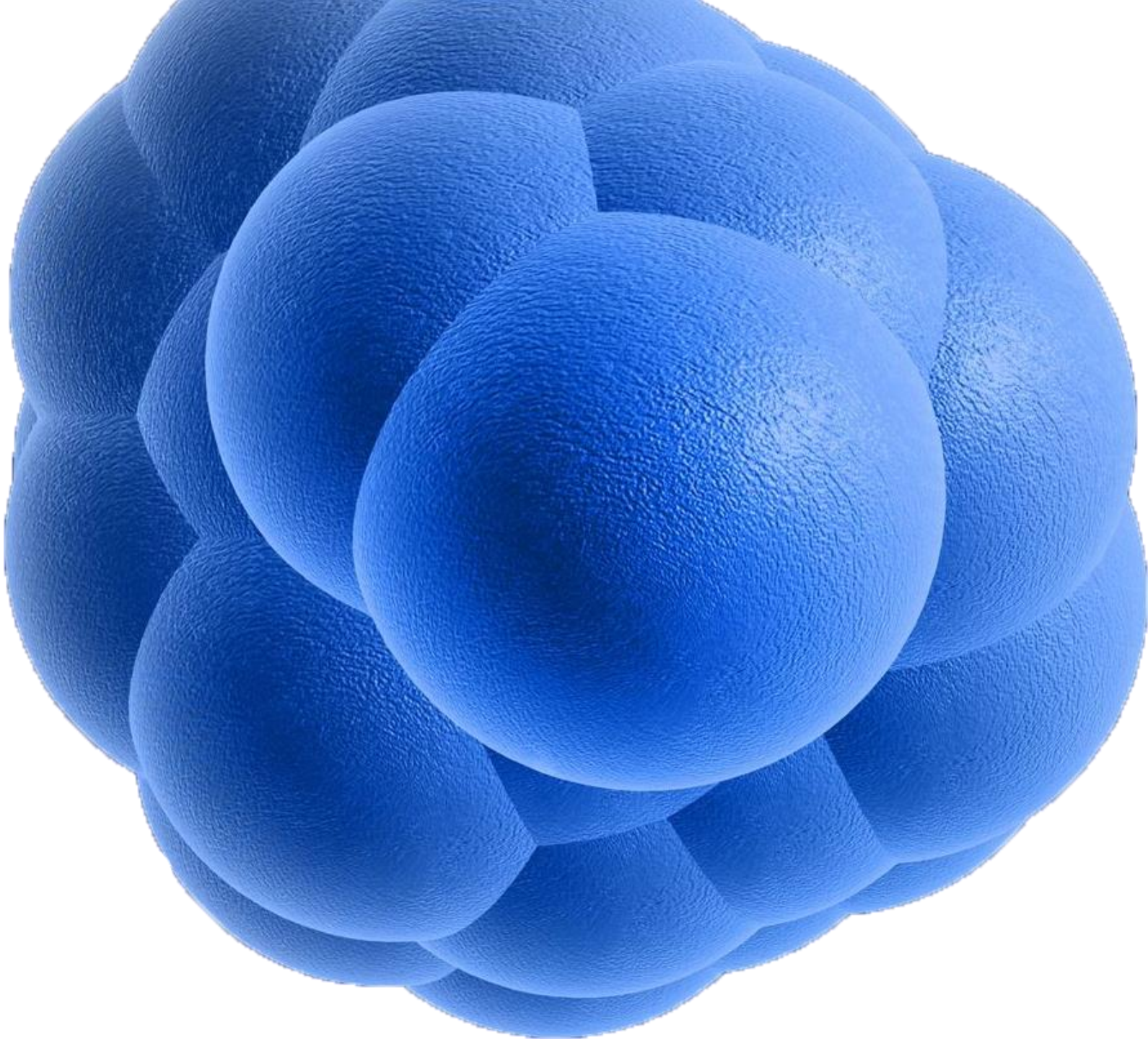
January 24th, 2018

Dr. John Hughes, DO

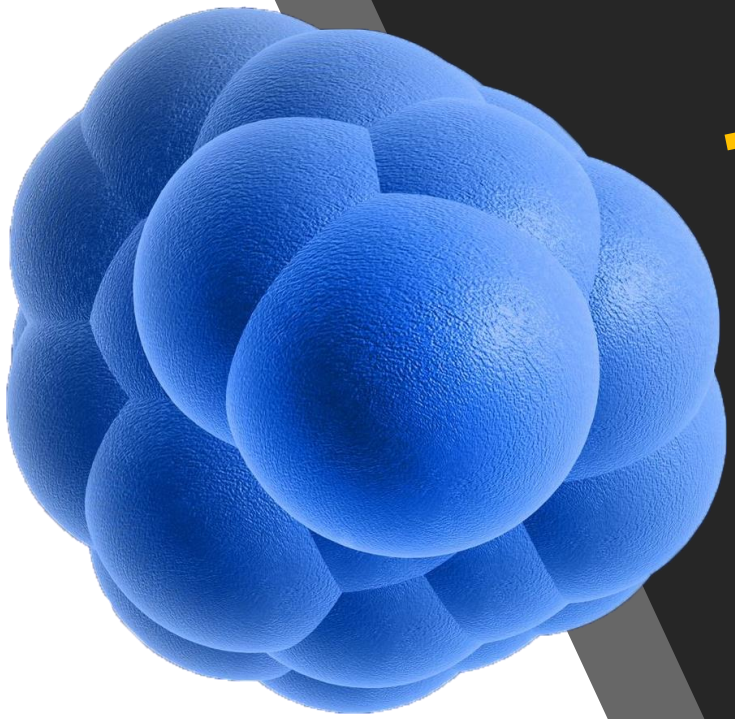
- Doctor of Osteopathy
- From Georgia
- Arizona College of Osteopathic Medicine - 2007
- Aspen Integrative Medicine - 2009
- TBI Therapy - 2014

Outline

- What Are Stem Cells?
- What Are Growth Factors?
- How to Treat Chronic Pain



What Are Stem Cells?
Defined



- Undifferentiated biological cells
- Divide and generate all cell types of the organ from which they originate
- Stimulate tissue re-growth and greater blood flow to the affected areas

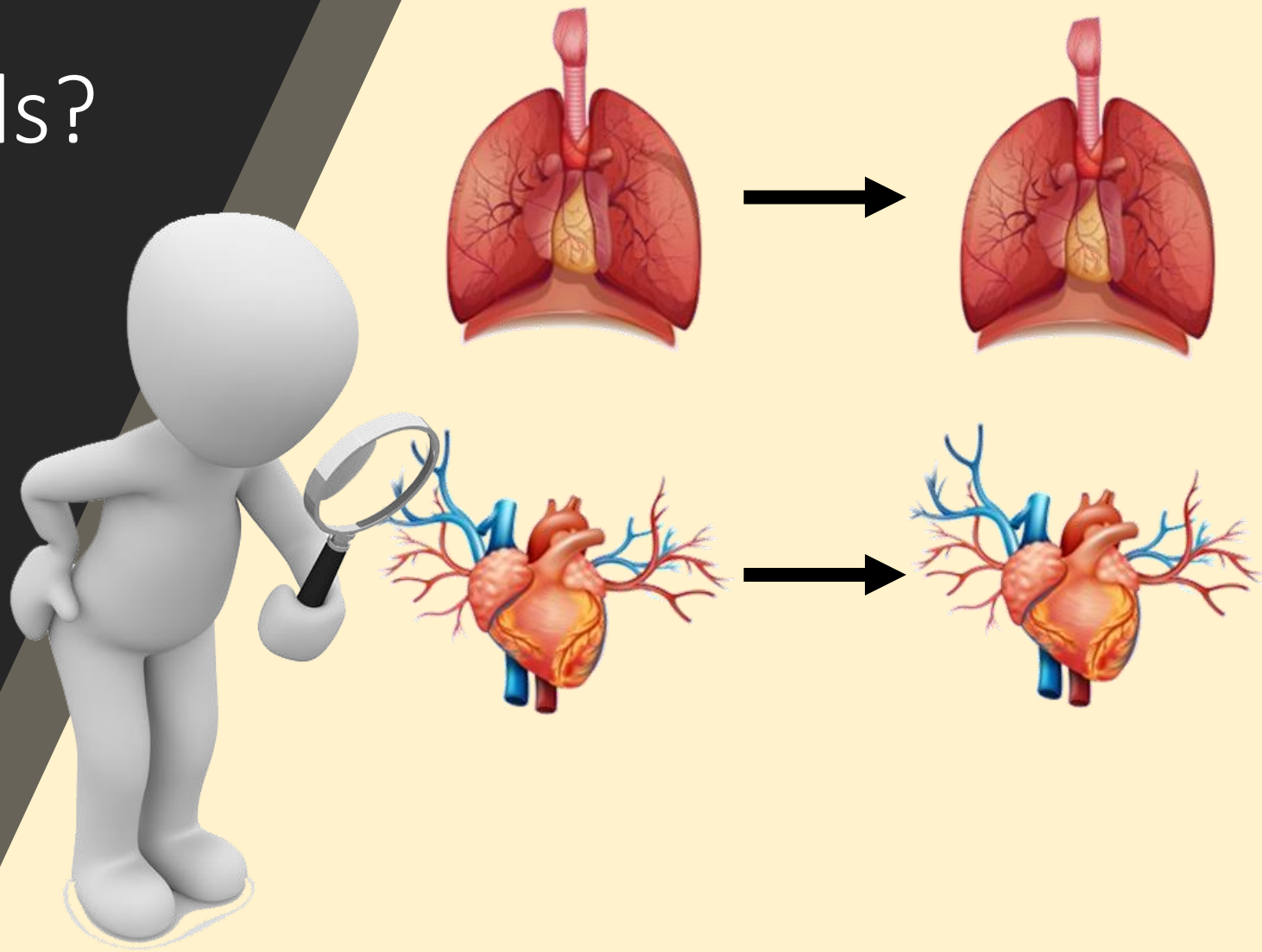
What Are Stem Cells?
Embryonic

- Mostly derived from embryos that develop from eggs *in vitro*
- Expensive
- Not autologous
- Ethically controversial
- Not readily available – research only

What Are Stem Cells?

Tissue-Specific

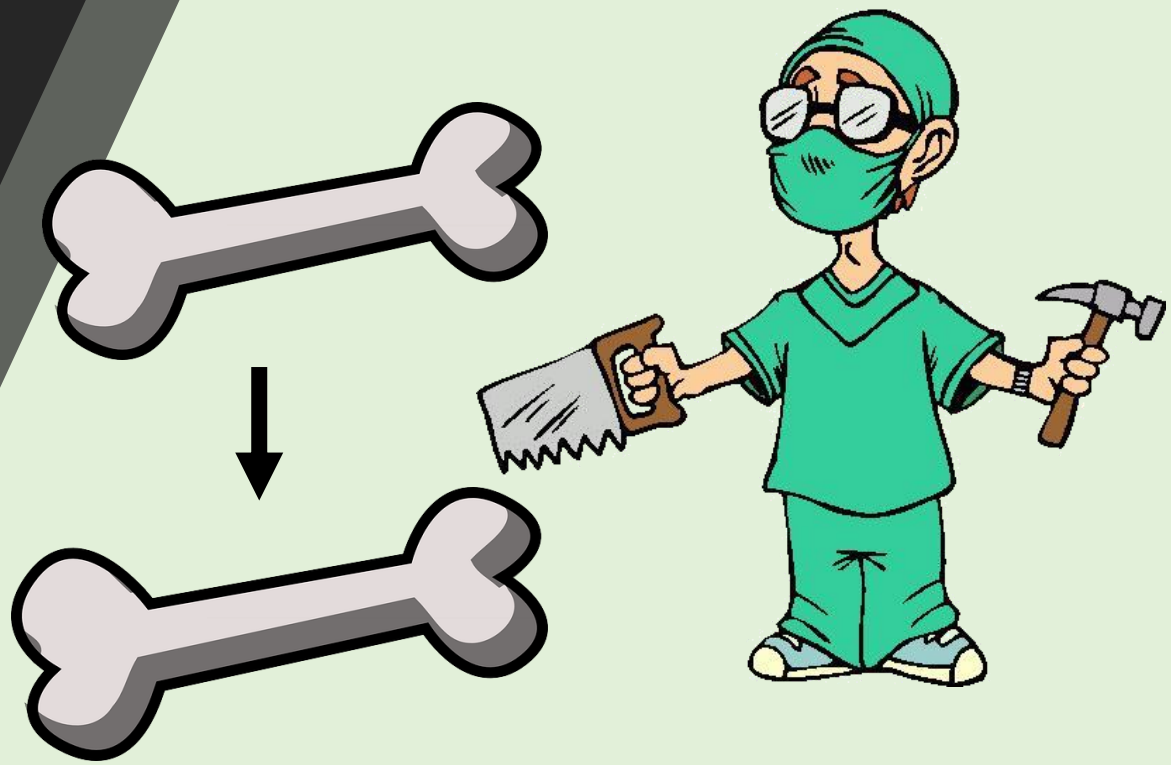
- For the specific tissue or organ in which they live
  - Lung – Lung
  - Heart – Heart
- Do not self-renew as easily
- Difficult to find



What Are Stem Cells?

Mesenchymal

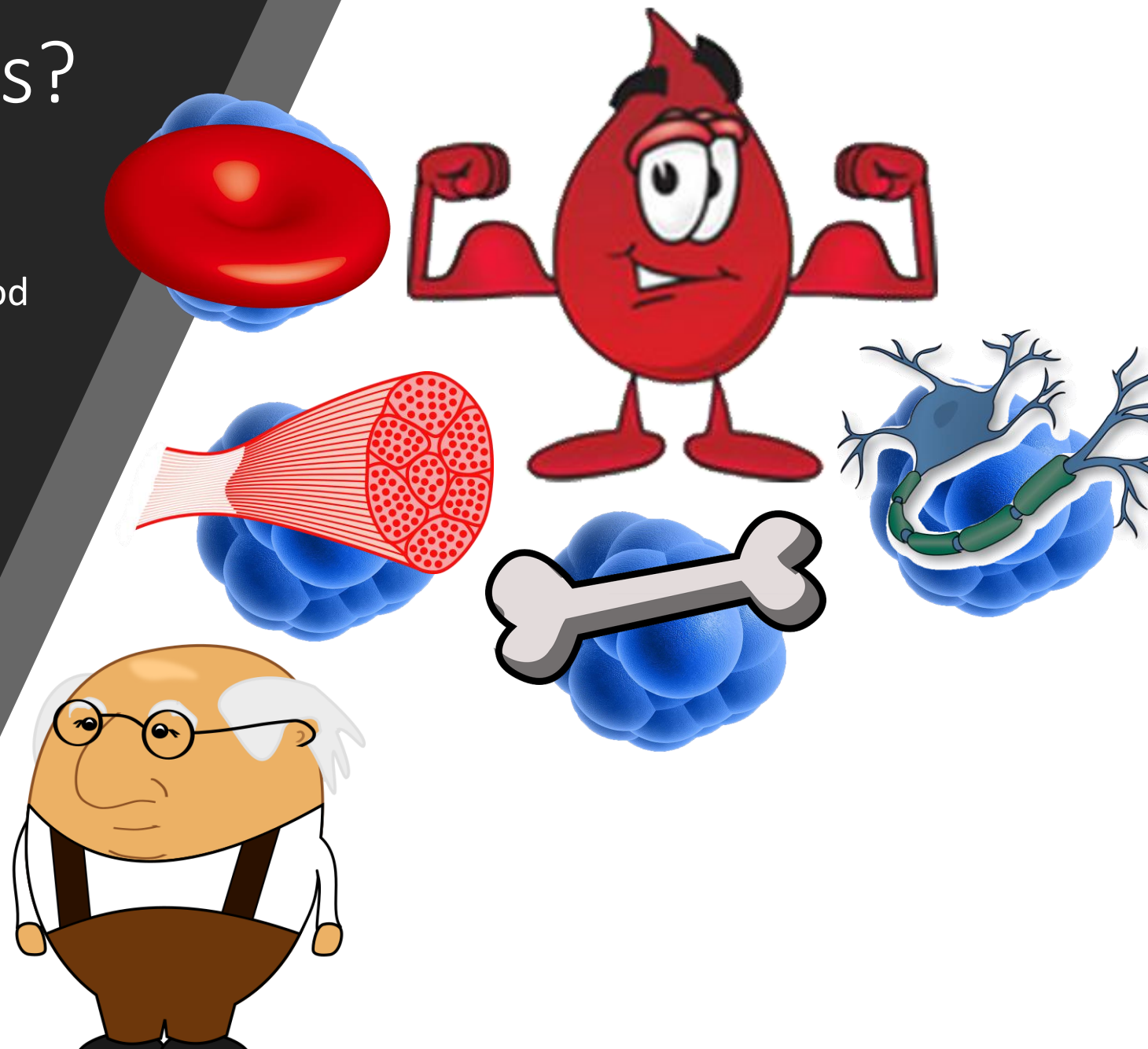
- From bone marrow, fat, and cord blood
- Immunomodulatory properties
- On a development trajectory towards specific target tissues
- Therapeutic effects are short-lived

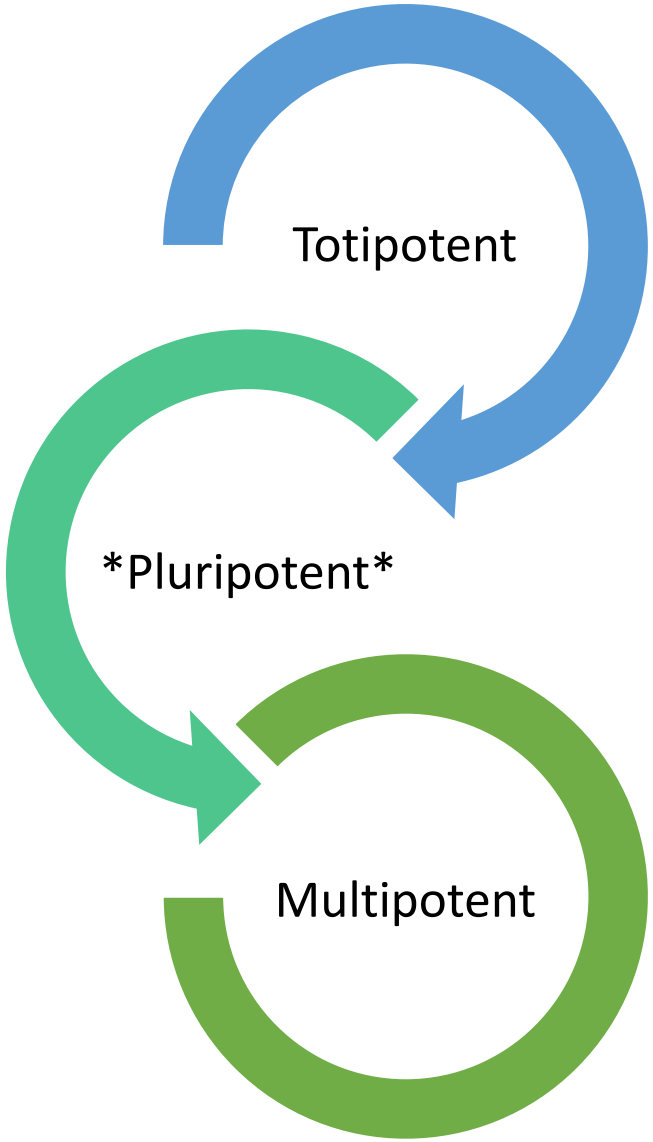


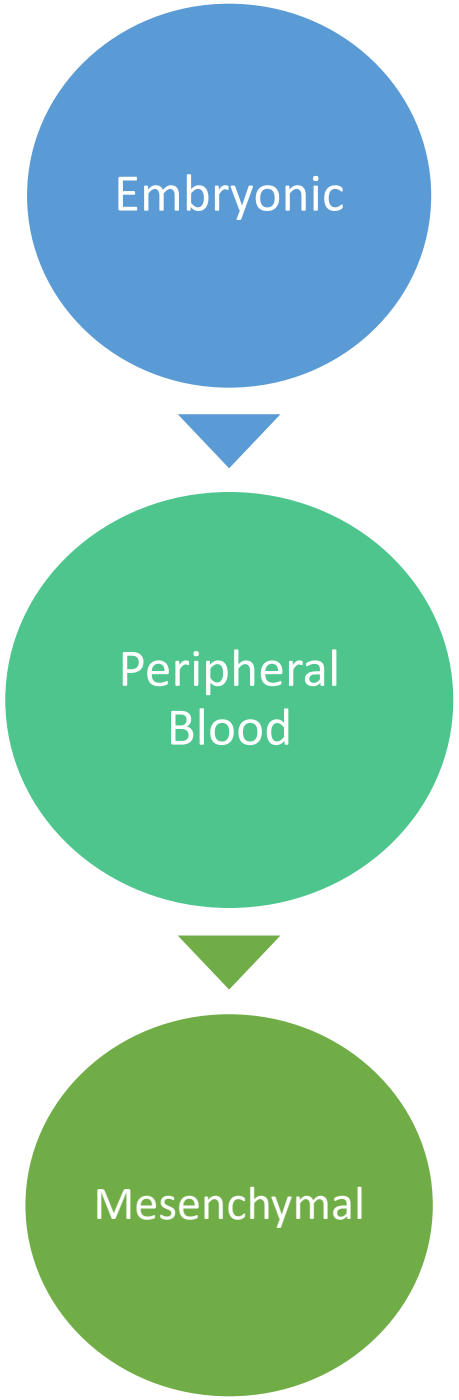
What Are Stem Cells?

Pluripotent

- Recently discovered in peripheral blood
- Behave like embryonic stem cells
- Give rise to all the cell types
- Long lifespan

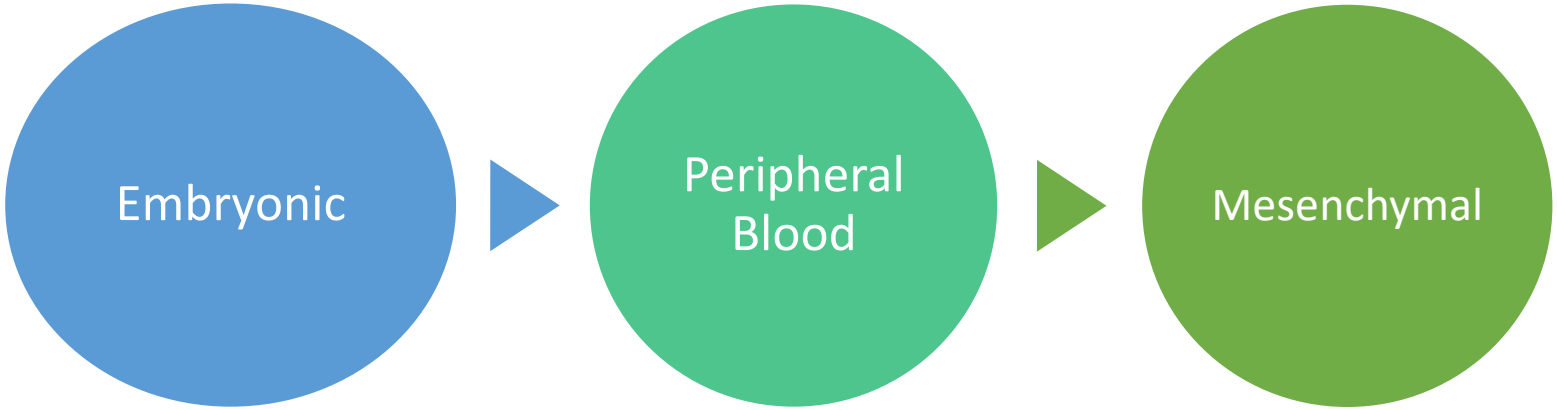






Stem Cell Potency

Stem Cell Uses

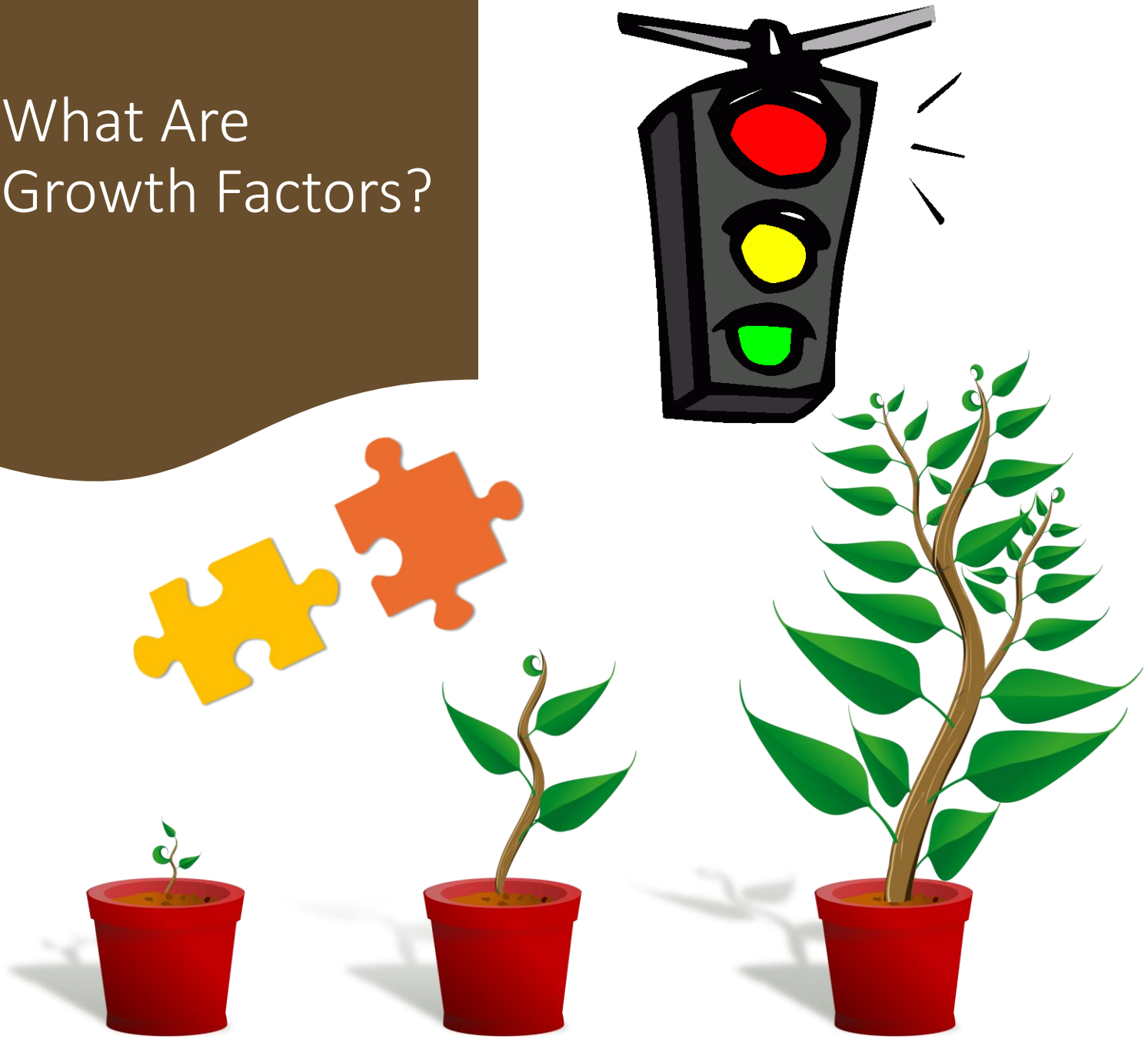


- Research
- Degenerative Diseases

- Degenerative Diseases:
  - Diabetes
  - Osteoarthritis
  - Osteoporosis
  - Alzheimer's Disease
- Regeneration:
  - Brain Injuries
  - Joint/Ligament Repair
  - Anti-aging
  - Post Cancer Treatment
  - Fertility

- Same tissue Replacement
- Systemic Inflammatory Conditions

What Are Growth Factors?



- Signaling molecules between cells
- Cytokines and hormones that bind to specific receptors
- Promotes cell differentiation and maturation

Stem Cells and Growth Factors

- Stem cells = seeds
- Growth factors = water/soil/fertilizer/sunlight
- Without growth factors, the seed cannot mature and grow

What Do Growth Factors Do?

- Designed to improve metabolism of nutrients
- Stimulate growth of collagen: cartilage, bone, ligaments, tendons, blood vessels, and neurons
- Guide stem cells to area of injury
- Nurture stem cells to maturity

Growth Factors + Stem Cell Uses

- Chronic Sports Injuries (ex. Tennis Elbow, Achilles Tendonitis, and Runner's Knee)
- Degenerative Joint & Disc Disease
- Chronic Sprains and Strains
- Cervical, Thoracic, and Lumbar Spine Strains
- Traumatic Brain injuries
- Arthritic Joints
- Shoulder Pain, Hip Pain, and Knee Pain
- Ligament Laxity or Tears
- Tendon and Ligament Injuries
- Carpal Tunnel Syndrome

How to Treat Chronic Pain

- Surgery – expensive, risky, potential side effects
- Physical Therapy – only manages pain, therapeutic but not long term
- Cortisone Injections – temporary fix, manages inflammation, rarely solves source of pain, potentially damaging
- Regenerative Injection Therapy – natural, autologous, treats cause of pain rather than symptom, long term

Chronic Pain Treatment Costs

- Surgery = $40,000 - $100,000
- Physical Therapy = $50 - $350 per session
- Embryonic Stem Cells = only research purposes
- Pluripotent Stem Cells = $8,000 - $10,000
- Mesenchymal Stem Cells = $7,000 - $300,000
- Platelet Rich Plasma (PRP) = $1,400 - $2,000

What Treatment Should You Choose?

ASPEN INTEGRATIVE MEDICINE

970-927-0308 | aspenintegrativemedicine.com