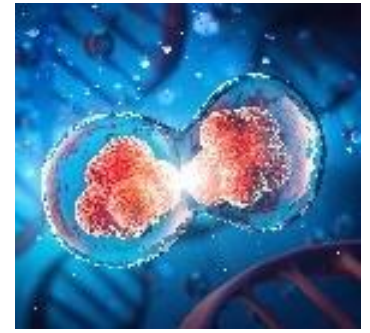


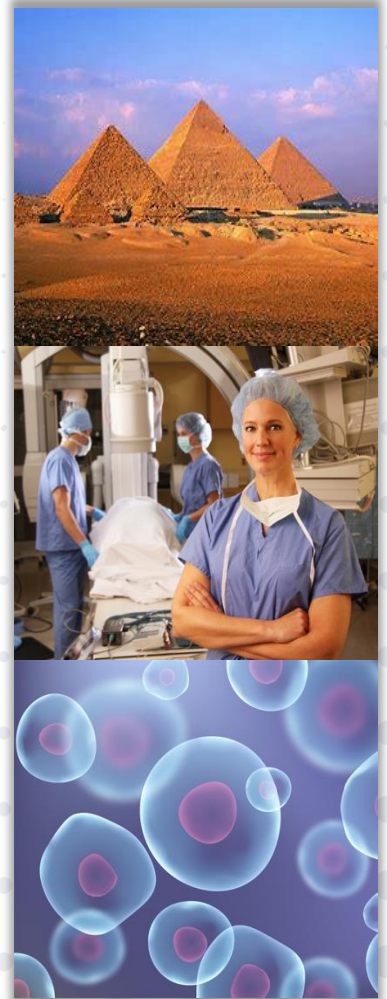


Regenerative Protein Arrays (RPA): Potentially Offering A New Future

REGENERATIVE PROTEIN ARRAYS

Regenerative Medicine: The Origins & History

- Long before the term “Regenerative Medicine” was coined, ancient Sumerian, Egyptian, Chinese, Indian and South Americans pioneered medical discoveries that still impact the field today. Examples would be the use of vegetable and mineral concoctions and skin graft procedures for cleansing/debridement of wounds.¹⁴
- The early 1800’s saw a huge expansion in the fields of biology and medicine when scientists revealed that all life depends on chemical reactions that occur within cells and could be reproduced in the laboratory.¹⁴
- The discovery in the early 1900’s that cell division and heritability in the form of a helical, ladder-like structure, called DNA, geared science up for “a whole other ball game.”¹⁴
- Regenerative medicine has grown from activities in the mid-1900’s including surgery (organ transplantation), surgical implants (artificial hips), and sophisticated bio-material scaffolds (skin grafts.)¹⁴
- Following this wave of enthusiasm for new technologies in the field, cell biologists began to research the capabilities of tissues being able to be grown and harvested for transplantation, thus began the era of Tissue Engineering, which has lead to the field of Regenerative Medicine.¹⁴



An Example To Guide Your Learning

- Meet Bill and Cindy Smith, fictional characters that are here assist in your journey of learning about Regenerative Medicine and how it may be able to impact your life.
- Bill is a 71 year-old male, with an injury to his rotator cuff (shoulder), Irritable Bowel Syndrome, and vision decline.
- Bill and Cindy try to enjoy an active retirement life, with a love for playing tennis, and for socializing with their fellow retirees in the community where they live.
- Bill's shoulder injury is causing issues with his ability to play in their tennis leagues, as well as do the gardening that him and his wife enjoy. Further, his IBS has left him shying away from socializing due to embarrassment of having an accident.
- Through meeting with multiple specialty clinicians, Bill learns...



His Traditional Therapy Options

- **NSAIDS**

- His doctor explains that while readily accessible, low cost, relatively safe, these may be contributing to his digestive system issue, and may hold risks of stomach ulcers, heart failure, stroke, kidney and liver disease.^{1,2}

- **Physical Therapy:**

- Bill learns that continuing his PT is key to reducing pain and inflammation, functional and balance improvement over the long term. However, like so many, his poor adherence to the regimented program, due to increased short-term pain and swelling as well as the time investment, explains why he hasn't achieved some of the results he's been looking for. ^{3,4,5,6,7,8}

- **Corticosteroid Injections:**

- Further, Bill's doctors explains to him that despite steroid injections producing short-term reduction of pain and swelling, the diminished effectiveness is normal with each additional injection. Further, it is explained that steroids accelerate joint degeneration, osteoporosis, nerve damage and can even cause elevated blood sugar and pressure. ^{9,10, 11,12,13}



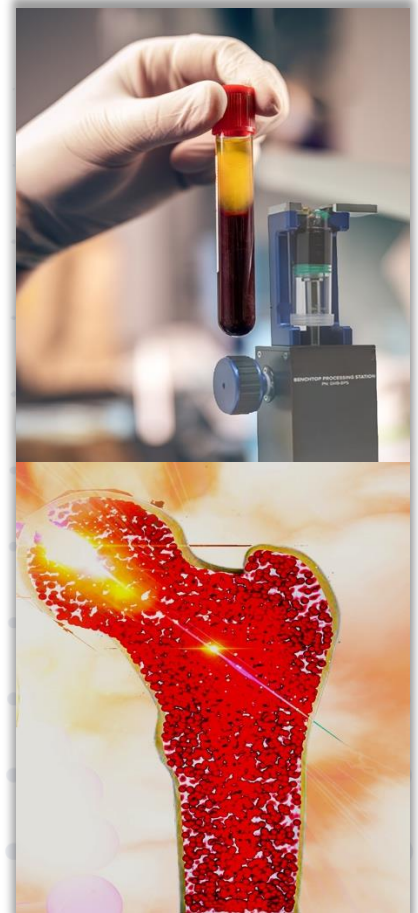
His Regenerative Medicine Options

- **Autologous Therapies**

- Bill has heard of PRP and discusses autologous therapies that are derived from his own blood, bone marrow, adipose tissue, etc., hence decreasing the risk of transmittable disease. Many of these have been well researched and proven to be effective in conditions like ligament tears, pulled muscles, joint sprains, plantar fasciitis, hair loss, etc., but are also subject in effectiveness to Bill's age, diet, tobacco use and alcohol consumption. With Bill being 71, enjoying his cigars and whisky regularly, and being slightly overweight, these factors become a consideration for him and his treating clinician.

- **Allogeneic Therapies**

- His clinician then introduces him to autologous therapies like amniotic fluid, exosomes, stem cells, etc., that are derived from a donor other than Bill. He learns that such therapies have been used in medicine for over 100 years, and have demonstrated results in creating new vessels, breaking down scar tissue, providing cushioning, and accelerating healing. Despite the track record of safety, with donors being extensively tested by CLIA/FDA certified labs, there are the additional risks that Bill and his clinician need to consider of Bill's body rejecting these cellular therapies, or the transference of communicable disease. ^{25,26,27,28,29,30}

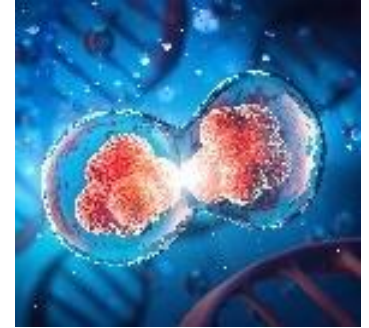


His Regenerative Medicine Options (Cont'd)

- **Regenerative Protein Array Therapy**

- There is another, new therapy that Bill's clinician informs him of that is an acellular, non-biologic protein array that may potentially offer the effectiveness and safety that he's looking for.
- Regenerative Protein Arrays (RPA) are in a unique category called "cell factors", are acellular / non-biologic proteins that undergo extensive donor screening, FDA/CLIA lab testing, and endotoxin testing for sterility and filtering to remove cellular matter for patient safety.
- Bill's clinician also explains to him that RPA is derived from all three layers of the human placenta (endo, ecto, endoderm) that are responsible for brain/nerve, soft tissue/organ, and musculoskeletal development.
- This may provide an opportunity to treat Bill as a whole patient, rather than just his injured shoulder and potentially restore his tennis game and social life.





**We Look Forward To Providing
You With World Class Care.**

**Your Healthcare Practitioner Will Be
In Shortly To Answer Questions.**

REGENERATIVE PROTEIN ARRAYS

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