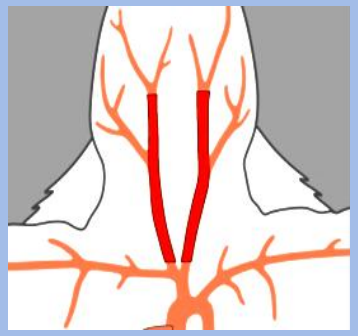
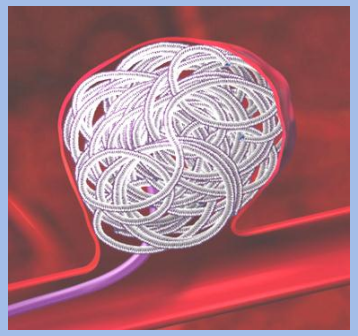
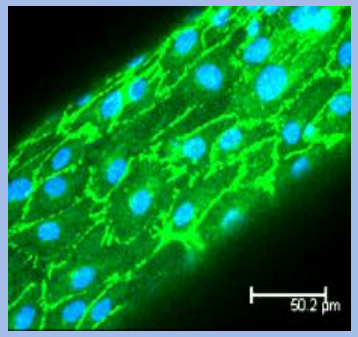
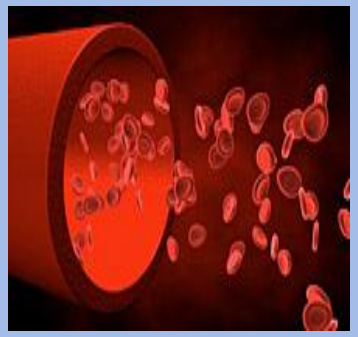
Tissue-Engineered Aneurysm Occlusion







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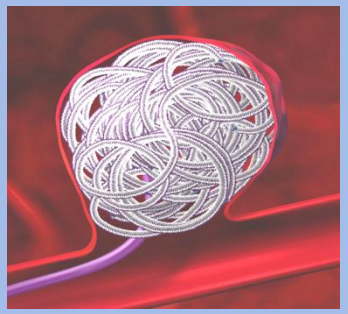
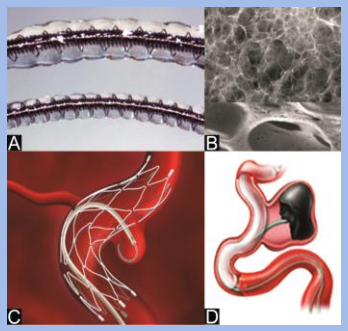
Introduction – Background

- **Endovascular Treatment** of small narrow-necked cerebral aneurysms has become an **Equivalent Alternative** to microsurgical clipping.

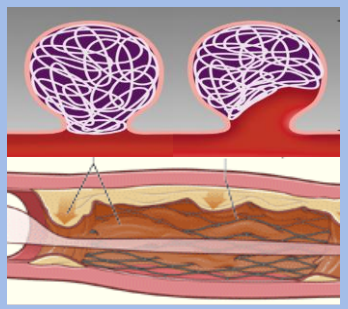


- Introduction of **Guglielmi Detachable Platinum Coils** at the beginning of the 1990's numerous attempts to enlarge field of application from **Small-Necked Aneurysms** to complex or broad-necked aneurysms.



- The **Current Armamentarium** includes bioactive coated HydroCoils, three-dimensional coils, liquid embolic agents (Onyx), balloon remodeling techniques, micro stents, and flow diverters.

Introduction – Objective



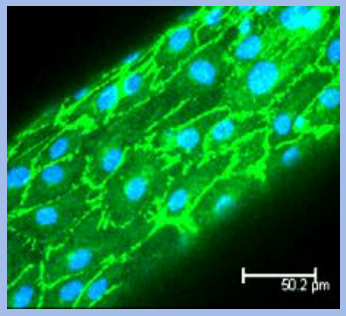
- **Many Unsolved Problems**: **Coils**: persisting neck remnants, high rates of recanalization. **Stents**: implant migration, disturbance of adjacent vessels, lifelong anticoagulation, and in-stent stenosis.

- Trend toward of biologically **Inert Embolization Materials** (Onyx, HydroCoil) is **Irrational:** aneurysm filled with foreign material, no biological effect, holds aneurysm wall apart, exerts pressure on the wall itself, and actually **Interferes with Aneurysm Healing**.

- In the future, the focus will be on the **Biological Activity** of the endovascular device. **Go Organic**, complete aneurysm occlusion **Tissue Engineered Reconstruction** of the affected vasculature.

Methods – Ingredients

- **Fibrin Glue** will serve as **Biomatrix** for substances and cells. High concentration of components and fibrinolysis inhibitor (aprotinin) results in **Delayed Degradation**.



- **Fibroblasts**, **Smooth Muscle Cells**, **Endothelial Cells** in combination with growth factors. Cell suspension is incubated with a **Fluorescent Cell Marker**.

- **Mix** of Biomatrix, Cells, and Growth Factors as a **Biologically Active Embolization Material** will be used to occlude venous pouch sidewall aneurysms in rats.

Outlook – and Challenges

Fibrin Glue | **Cell Culture** | **Flow Dynamics** | **Application** | **Architecture**