



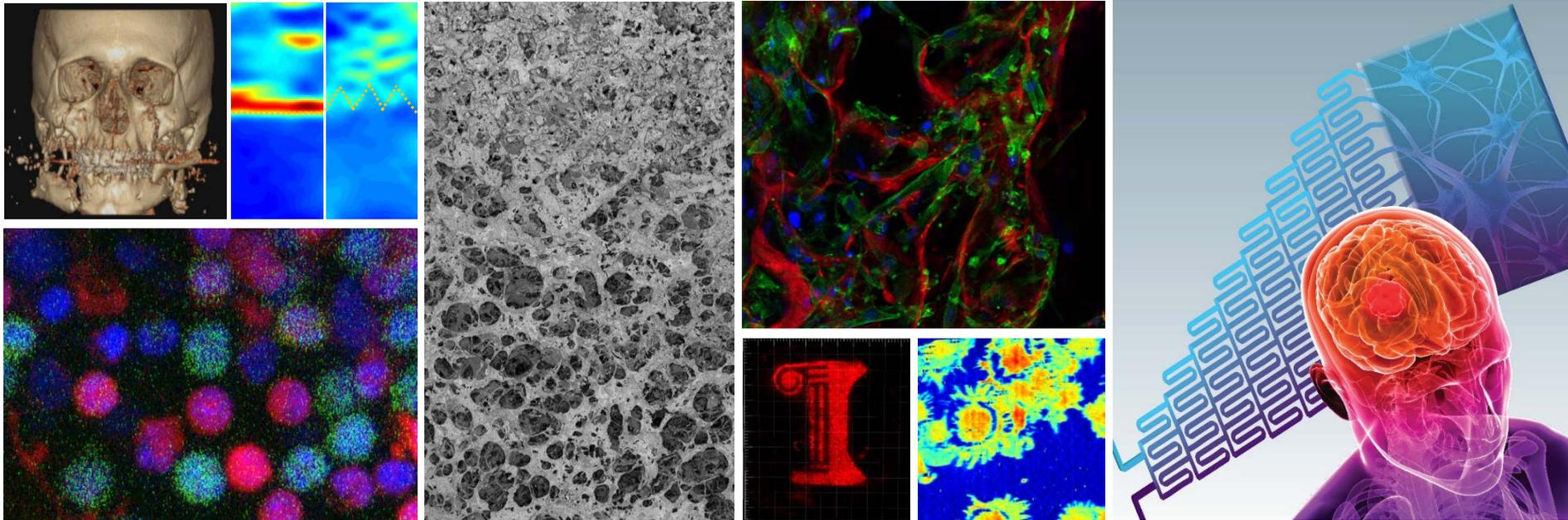
# Advanced biomaterials that instruct biology

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Tissue engineering – the integration of biomaterials, cells, & biologics – provides a framework to regenerate tissues, study biological mechanisms, and pursue personalized medicine. As the tissues in our bodies are dynamic, spatially-patterned, & heterogeneous over multiple length and time scales, new approaches are needed to instruct increasingly complex cell responses. We engineer biomaterials at the structural and biomolecular level to replicate these heterogeneities for advanced tissue engineering applications.



**Artificial bone marrow:** *engineering HSC fate, monitoring remodeling, tracing heterogeneity*

**Biomimetic tumor microenvironments:** *profiling glioblastoma invasion at the margins*

**Penetrating maxillofacial & osteotendinous injuries:** *regeneration & immune response*

**Microfluidics, hydrogels, scaffolds, anisotropic & graded materials, multi-scale composites**