Disrupting Biology: Microfluidic Systems Come of Age

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Gonadal hormones regulate systemic organ function including the reproductive tract, bone, muscle and cardiac tissue. Yet, interactions between these tissues are never tested in vitro creating a gap in knowledge that cannot be address with current petri dish technology. Our group has developed a number of in vitro microfluidic systems that permit microdynamic fluid flow across individual or multi-organ systems, better mimicking the in vivo environment. This technology is important to understanding normal physiological interactions and to model human diseases. The system is also envisioned to be useful in studying toxicologic agents and factors that may be endocrine disrupters. An ability to study ex vivo organs as systems rather than individual tissues or cells is enabling technology toward better biology, personalized medicine and earlier discovery of environmental health hazards.