Abstract: In the biological sciences, the data we observe arise from intricate molecular and cellular interactions. Understanding these hidden processes is crucial to advancing our knowledge of biological systems. A predominant approach to machine learning emphasizes performance metrics, such as predictive accuracy, often making minimal assumptions about the data-generating mechanism. However, in the biological sciences, the absence of a clear "ground truth" makes performance evaluation challenging. Statistical machine learning offers a complementary framework, utilizing probabilistic models to infer underlying data-generating distributions and account for uncertainty, revealing aspects of these complex systems. In this talk, I will showcase examples of machine learning in biomedical research, with a focus on cancer clonal reconstruction as a case study in how statistical machine learning can help explain dynamic cellular behavior. I will then explore recent advancements in artificial intelligence that integrate the strengths of both statistical and empirical approaches, while also discussing some of the limitations preventing full adoption of these AI-based advances in biological research.