Translating a Trillion Points of Data into Therapies, Diagnostics, and New Insights into Immunology

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There is an urgent need to take what we have learned in our new "genome era" and use it to create a new system of precision medicine, delivering the best preventative or therapeutic intervention at the right time, for the right patients. Dr. Butte's lab at the University of California, San Francisco builds and applies tools that convert trillions of points of molecular, clinical, and epidemiological data -- measured by researchers and clinicians over the past decade and now commonly termed "big data" -- into diagnostics, therapeutics, and new insights into disease. Several of these methods or findings have been spun out into new biotechnology companies. Dr. Butte, a computer scientist and pediatrician, will highlight his lab's recent work, including the use of publicly-available molecular measurements to find new uses for drugs including new therapies for autoimmune diseases and cancer, discovering new druggable targets in disease, integrating and reusing the clinical and genomic data that result from clinical trials, and how the next generation of biotech companies might even start in your garage. In particular, Dr. Butte will describe the public data resources in the NIAID ImmPort available to study immunology, infection, vaccination, and transplantation, and how these resources can be used to better target drugs and understand immunity across tens of thousands of individuals.