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"Polymer Genome: An Informatics Platform for Rational Polymer Dielectrics Design and Beyond."

Abstract: The Materials Genome Initiative (MGI) has heralded a sea change in the philosophy of materials design. Here, we highlight the importance of computational data generation and screening, targeted synthesis and characterization, polymer fingerprinting, machine-learning prediction models, and the creation of an online Polymer Informatics platform (https://www.polymergenome.org) to guide ongoing and future polymer discovery and design. We lay special emphasis on the fingerprinting of polymers in terms of their genome or constituent atomic and molecular fragments, an idea that pays homage to the pioneers of the human genome project who identified the basic building blocks of the human DNA. By scoping the polymer genome, we present an essential roadmap for the design of polymer dielectrics, and provide future perspectives and directions for expansions to other polymer subclasses and properties.