Comparison of CyTOF assays across sites: Results of a six-center pilot study - DTU Orbit (23/10/2018)

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For more than five years, high-dimensional mass cytometry has been employed to study immunology. However, these studies have typically been performed in one laboratory on one or few instruments. We present the results of a six-center study using healthy control human peripheral blood mononuclear cells (PBMCs) and commercially available reagents to test the intra-site and inter-site variation of mass cytometers and operators. We used prestained controls generated by the primary center as a reference to compare against samples stained at each individual center. Data were analyzed at the primary center, including investigating the effects of two normalization methods. All six sites performed similarly, with CVs for both Frequency of Parent and median signal intensity (MSI) values < 30%. Increased background was seen when using the premixed antibody cocktail aliquots at each site, suggesting that cocktails are best made fresh. Both normalization methods tested performed adequately for normalizing MSI values between centers. Clustering algorithms revealed slight differences between the prestained and the sites-stained samples, due mostly to the increased background of a few antibodies. Therefore, we believe that multicenter mass cytometry assays are feasible.

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