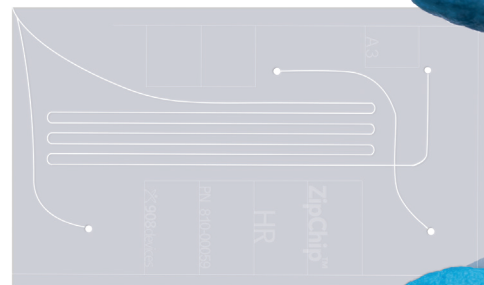


JOURNAL ARTICLE

Characterization of Intact Antibody Drug Conjugate Variants Using Microfluidic Capillary Electrophoresis-Mass Spectrometry.

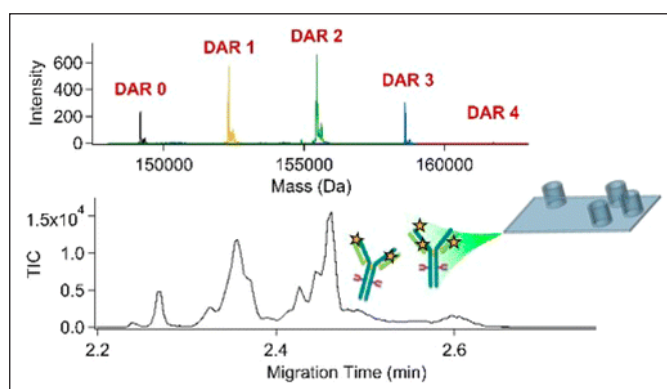
Published Journal Articles on Microfluidic ZipChip CE-ESI-MS
J.M. Ramsey Group at the University of North Carolina, Chapel Hill, NC



(4) Redman, E. A.; Mellors, J. S.; Starkey, J. A.; Ramsey, J. M. Characterization of Intact Antibody Drug Conjugate Variants Using Microfluidic Capillary Electrophoresis-Mass Spectrometry. *Anal. Chem.* 2015, 86, 3493–3500

ABSTRACT: In this work, we utilize capillary electrophoresis–mass spectrometry (CE–MS) in an integrated microfluidic platform to analyze an intact, lysine-linked antibody drug conjugate (ADC) in order to assess post translational modifications and drug load variants. The initial charge heterogeneity of the unconjugated IgG-2 monoclonal antibody (mAb) was assessed by separating intact charge variants. Three main charge variants were resolved in the CE dimension. These variants were attributed to pyroglutamic acid formation and decarboxylation on the primary structure of the mAb through characteristic mass shifts and changes in electrophoretic mobility. Additionally, glycoforms of the antibody charge variants were identified in the deconvoluted mass spectra. The observed glycoforms and their distribution compared favorably to a released N-glycan analysis performed on the mAb.

After conjugation, the ADC was analyzed using the same microchip CE–MS method. The addition of a drug load resulted in a decrease in mobility and an increase in mass of 3145 Da. Five main species that differed in their respective drug-to-antibody ratios (DAR) were fully resolved in the CE separation, with each DAR displaying the same variant population observed on the unconjugated mAb. A DAR range of 0–4 was observed with an average of 1.7 drug loads. The DAR distribution generated from the microfluidic CE–MS data compared favorably to results from infusion-ESI-MS and imaging CE (iCE) analysis of the ADC, techniques commonly used for intact mAb and ADC characterization.



[Click here](#) to view the entire article.



908 Devices
+1.857.254.1500 | zipchip@908devices.com
www.908devices.com