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Rapid production of bispecific antibodies using 'off-the-shelf' IgG

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All current bispecific antibody platforms require antibody engineering and cloning up front to generate each new formulation. While made to order genes, advanced expression systems and new high efficiency cloning techniques can simplify and accelerate this process; the final products will frequently exhibit a loss of specificity, aggregation, light chain swapping, heterogeneity, etc. For many academic labs, this creates a barrier to entry into the field of bispecifics and for industry this limits the throughput of bispecific antibody production. Recently, we developed a simple method to site specifically and covalently attach an anti-CD3 single chain variable fragment (scFv) to any off-the-shelf, full length human Immunoglobulin G (IgG). This approach to making bispecific antibodies does not require antibody engineering, cloning or modifications. As a result, we can prepare libraries of bispecific antibodies with high purity in just a few hours. As proof of principal, we created a small library of eight bispecific antibodies simultaneously. IgG binding affinity was not affected by attachment of scFv to each heavy chain and T-cell mediated cell lysis assays confirmed potencies that were comparable to other bispecific antibody platforms.

Biography

Andrew Tsourkas is a Professor and undergraduate chair of Bioengineering at the University of Pennsylvania in Philadelphia, PA. He has received his Bachelor's degree in Mechanical Engineering in 1997 from Cornell University, Master's degree in 1999 from Johns Hopkins University and PhD in Biomedical Engineering from the Georgia Institute of Technology/Emory University joint PhD program in 2002. He has then conducted a two-year Post-doctoral Fellowship in Cellular and Molecular Imaging in the Department of Radiology at Harvard University, before joining Penn in 2004. He is currently the Associate Director for the Center for Targeted Therapeutics and Translational Nanomedicine. He has over 80 peer-reviewed and invited publications and was a recipient of the Wallace H. Coulter Foundation Early Career Award and the National Science Foundation Career Award. In 2015, he was also elected as a Fellow to the American Institute for Medical and Biological Engineering. He is an inventor on over a dozen patents and has founded four biotechnology companies.

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