

Publications

The following research articles from the Quake lab describe some of the applications of microfluidics to biomedical research that our lab is optimizing and making available to other investigators through research collaborations.

Automated chromatin immunoprecipitation:

Wu, A.R., Hiatt, J.B., Lu, R., Attema, J.L., Lobo, N.A., Weissman, I.L., Clarke, M.F., and Quake, S.R. (2009). Automated microfluidic chromatin immunoprecipitation from 2,000 cells. ***Lab Chip*** 9, 1365-1370.

Single-cell genotyping:

Fan, H.C., Wang, J., Potanina, A., and Quake, S.R. (2011). Whole-genome molecular haplotyping of single cells. ***Nat Biotechnol*** 29, 51-57.

Blainey, P.C., Mosier, A.C., Potanina, A., Francis, C.A., and Quake, S.R. (2011). Genome of a low-salinity ammonia-oxidizing archaeon determined by single-cell and metagenomic analysis. ***PLoS One*** 6, e16626.

Marcy, Y., Ouverney, C., Bik, E.M., Losekann, T., Ivanova, N., Martin, H.G., Szeto, E., Platt, D., Hugenholtz, P., Relman, D.A., *et al.* (2007). Dissecting biological "dark matter" with single-cell genetic analysis of rare and uncultivated TM7 microbes from the human mouth. ***Proc Natl Acad Sci U S A*** 104, 11889-11894.

High-throughput quantitative assays of protein-nucleic acid and protein-protein interactions:

Transcription factors

Maerkl, S.J., and Quake, S.R. (2007). A systems approach to measuring the binding energy landscapes of transcription factors. ***Science*** 315, 233-237.

Maerkl, S.J., and Quake, S.R. (2009). Experimental determination of the evolvability of a transcription factor. ***Proc Natl Acad Sci U S A*** 106, 18650-18655.

Fordyce, P.M., Gerber, D., Tran, D., Zheng, J., Li, H., DeRisi, J.L., and Quake, S.R. (2010). De novo identification and biophysical characterization of transcription-factor binding sites with microfluidic affinity analysis.

***Nat Biotechnol* 28, 970-975.**

RNA binding proteins / small molecule screens

Einav, S., Gerber, D., Bryson, P.D., Sklan, E.H., Elazar, M., Maerkl, S.J., Glenn, J.S., and Quake, S.R. (2008). Discovery of a hepatitis C target and its pharmacological inhibitors by microfluidic affinity analysis.

***Nat Biotechnol* 26, 1019-1027.**

Protein-protein interactions

Gerber, D., Maerkl, S.J., and Quake, S.R. (2009).

An in vitro microfluidic approach to generating protein-interaction networks.

***Nat Methods* 6, 71-74.**

Bates, S.R., and Quake, S.R. (2009).

Highly parallel measurements of interaction kinetic constants with a microfabricated optomechanical device.

***Appl Phys Lett* 95, 73705.**