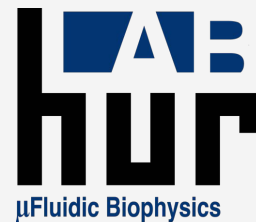


Differential Inertial Microfluidics for Biomedical Research

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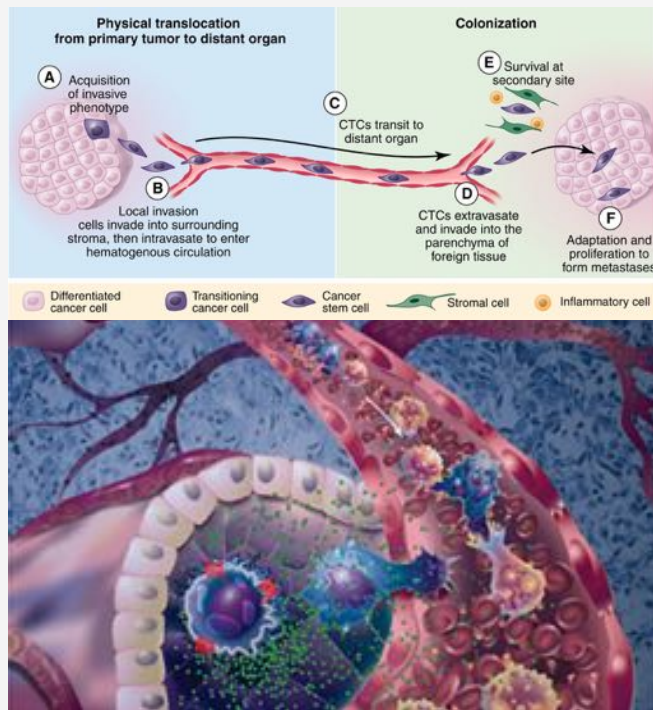
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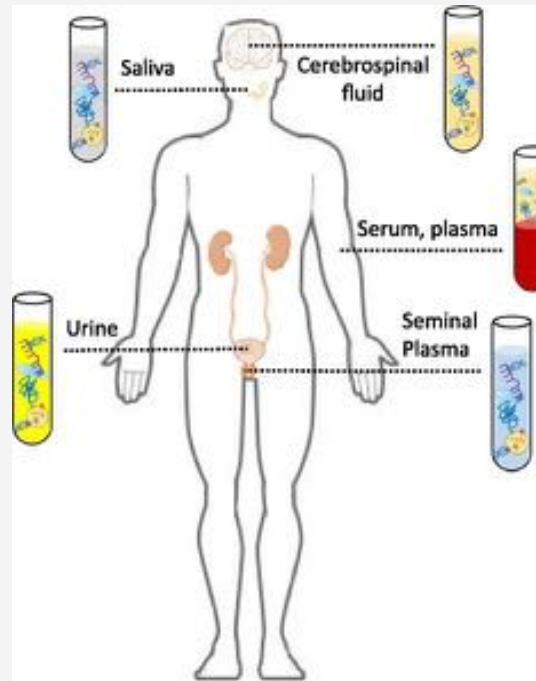
Personalized Cancer Theranostics

Circulating Tumor Cells



<http://kuhn.scripps.edu/default.aspx>

Liquid Biopsy



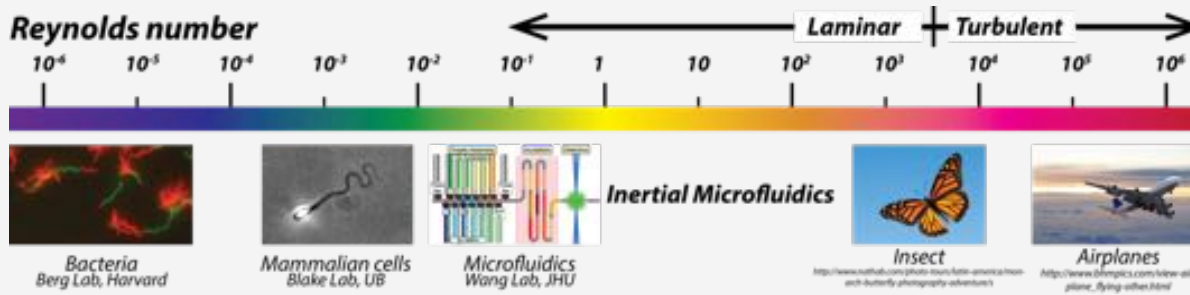
<https://goo.gl/TLzB6J>

Cytotoxic T-cells



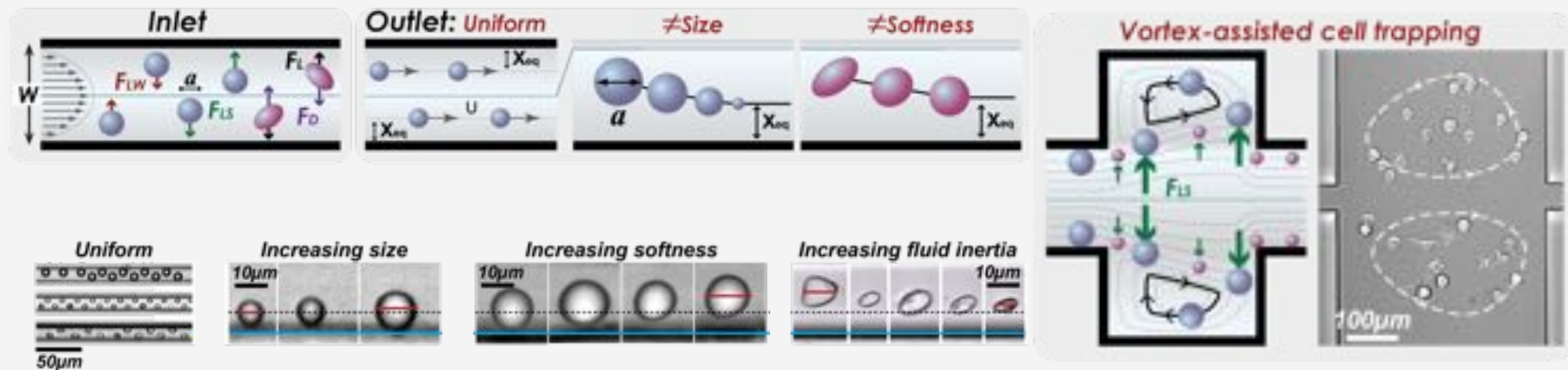
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Inertial Microfluidics

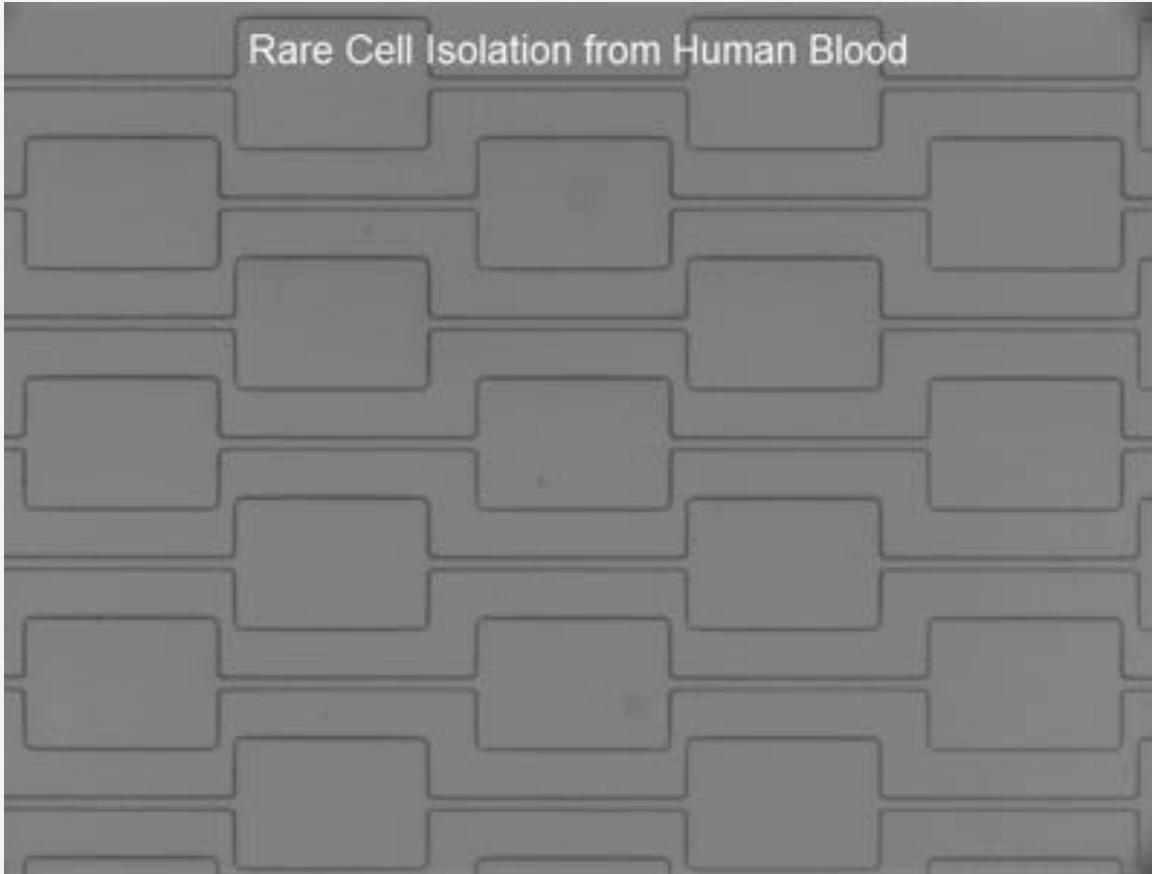


Inertial...

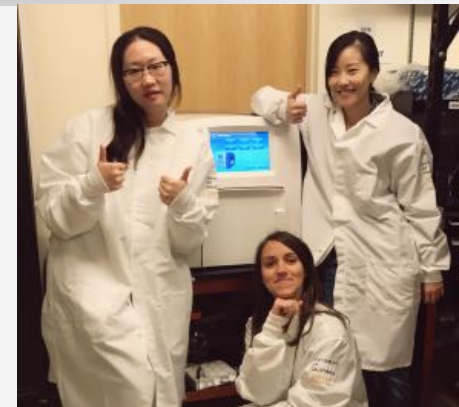
$$R_c = \frac{\text{Inertial}}{\text{Viscous}} = \frac{\rho U_m W}{\mu}$$



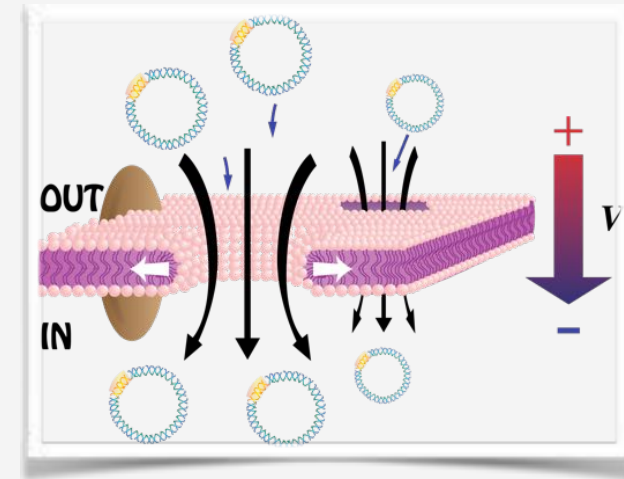
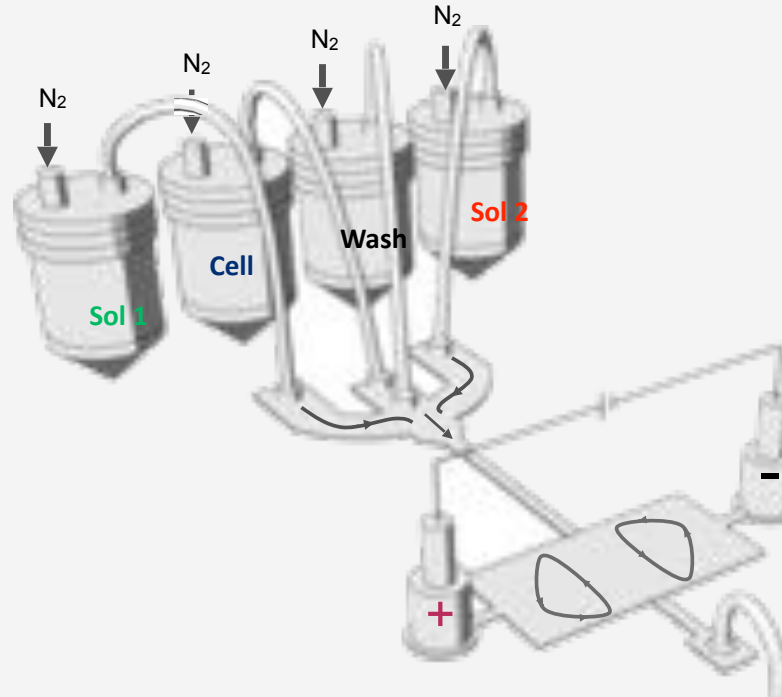
Massively Parallel CTC Filtration



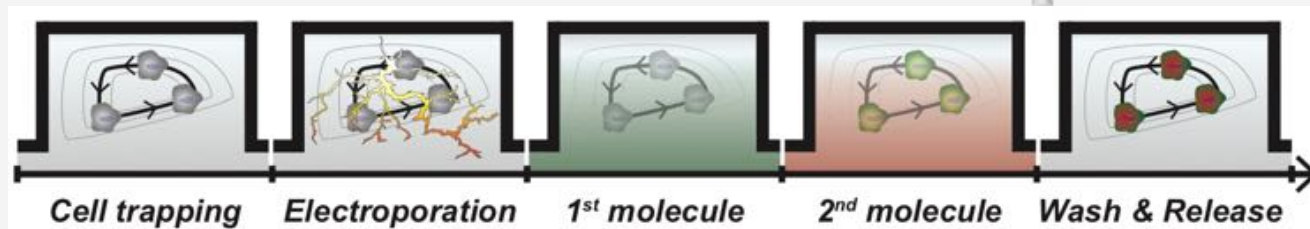
Hur and Di Carlo *Biomicrofluidics* 2011
Mach, Kim, Arshi, Hur and Di Carlo, *Lab Chip* 2011



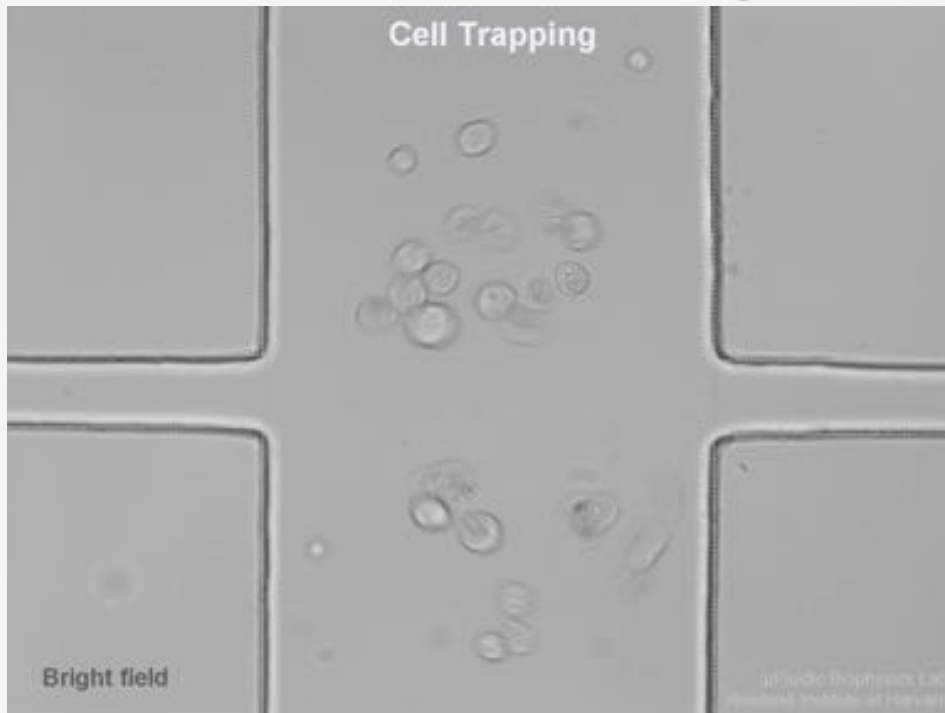
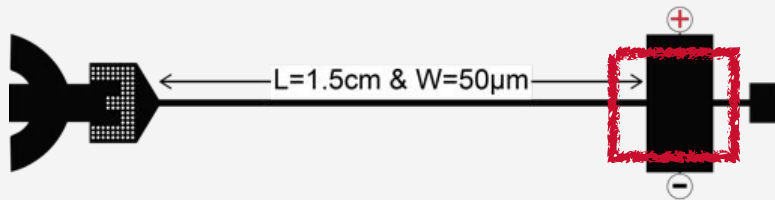
Electroporation for Intracellular Multi-Molecular Delivery



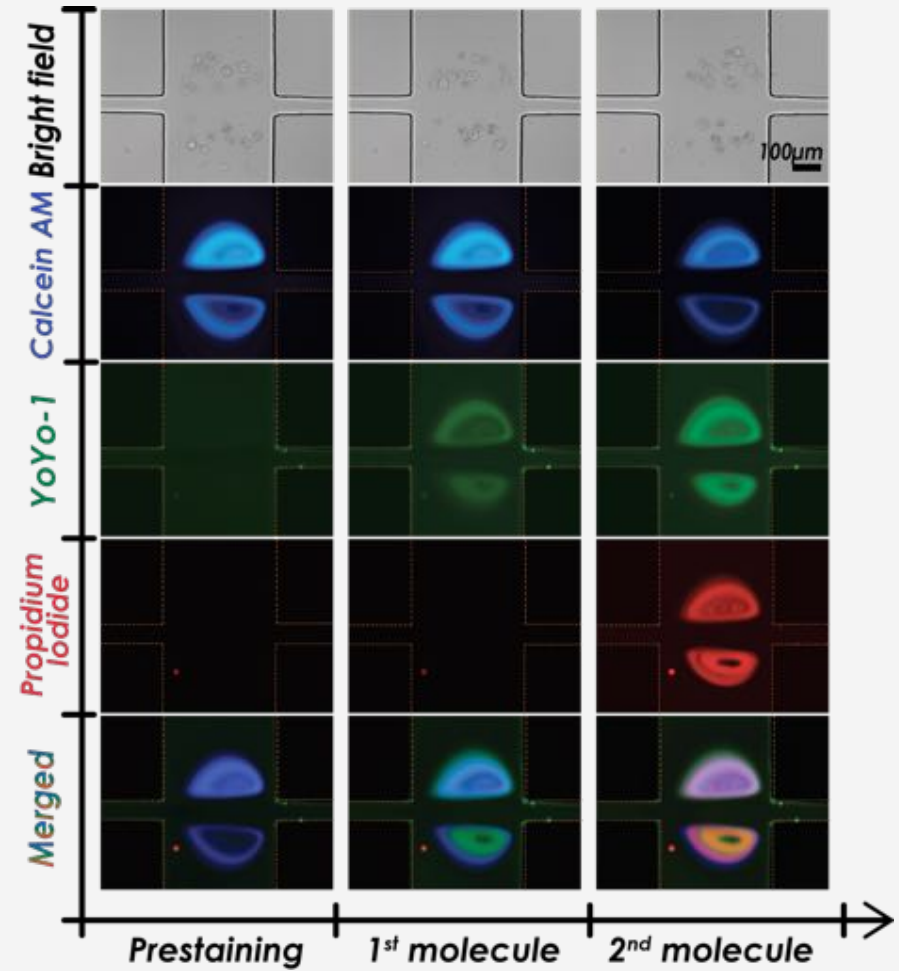
H. Yun and S.C. Hur, Lab on a Chip (2013)

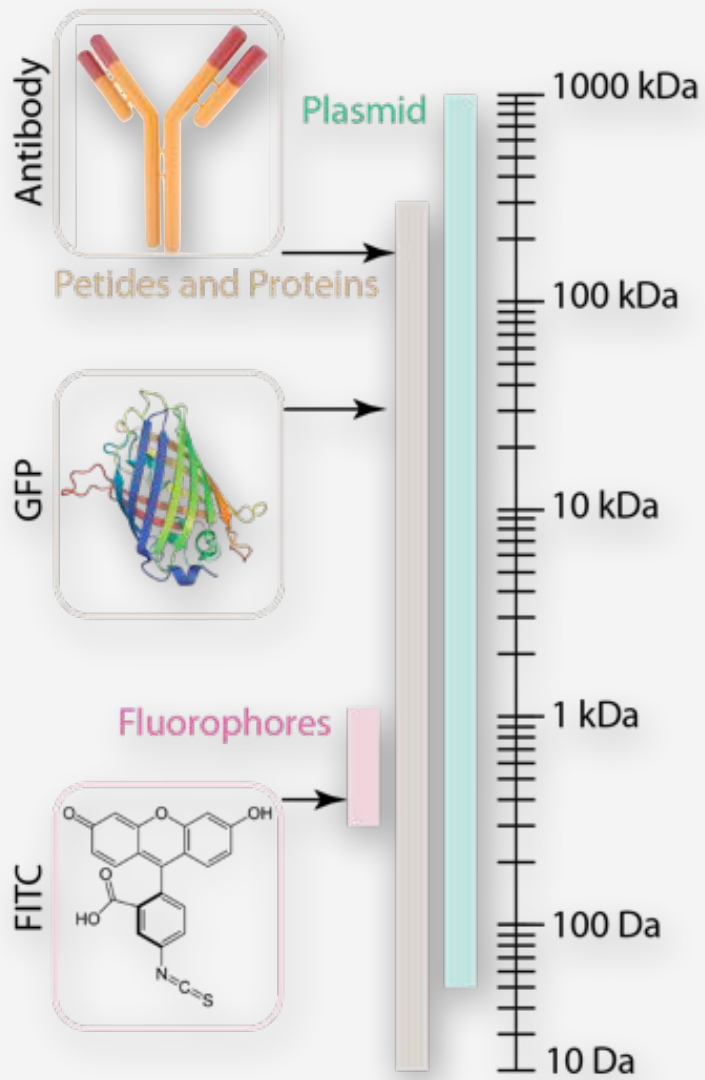


Sequential Multi-Molecular Delivery

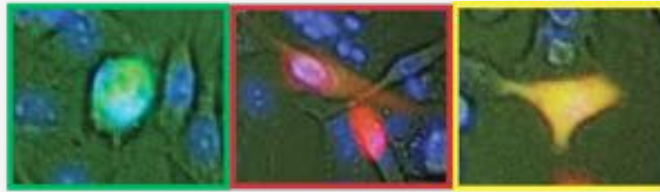


H. Yun and S.C. Hur, Lab on a Chip (2013)

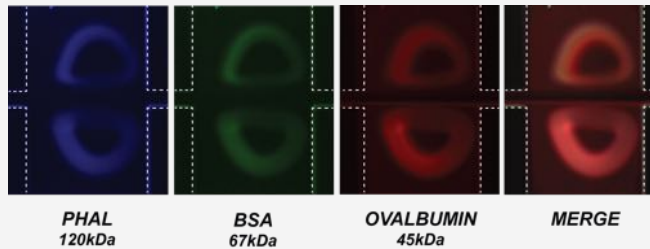




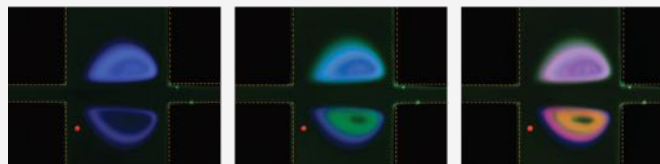
Plasmids, siRNAs and miRNAs



Intact Proteins

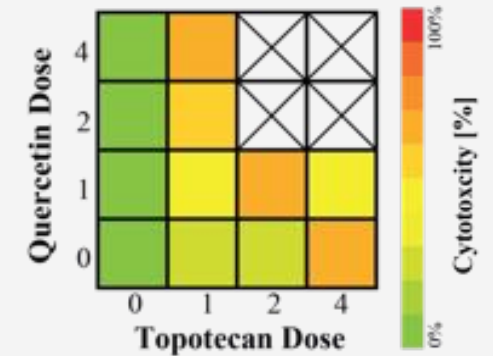


DNA fluorescent dyes

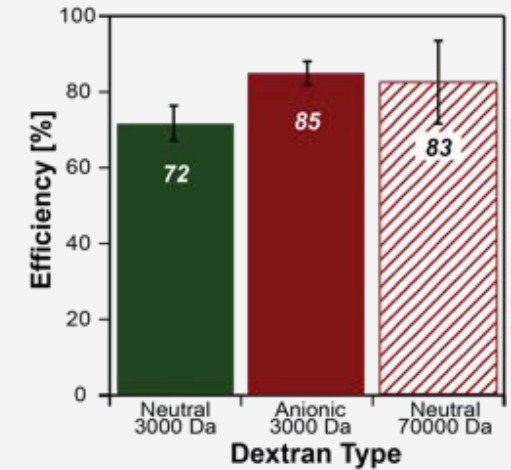


Yun and Hur, Lab on a Chip 2013
 Vickers and Hur, JoVE 2014
 Vickers, Ouyang, Choi and Hur, Anal. Chem 2014
 Ouyang *et al.*, Nat Sci. Rep 2017

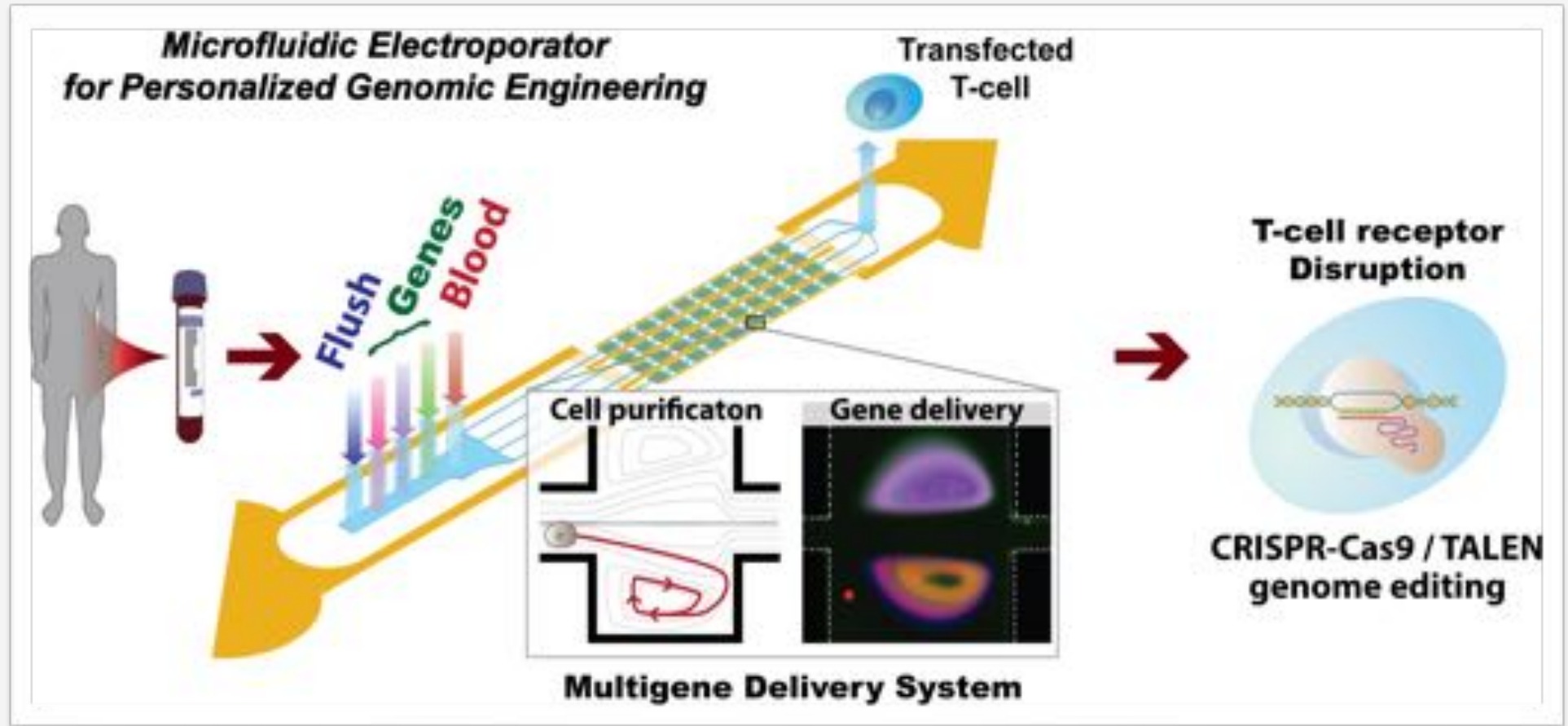
Drug Cocktail Evaluation



Macromolecules



Therapeutic T-cell Production



Thank you.

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