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Arranging Droplets for Microfluidics CRAIG PRIEST, ENKHTUUL SURENJAV, MAGDALENA ULMEANU, STEPHAN HERMINGHAUS, RALF SEEMANN, Max-Planck-Institute for Dynamics and Self-Organization — The online generation, organization and manipulation of monodisperse droplets in confinement present new possibilities for microfluidics. Droplets make excellent compartments for handling minute quantities of chemical, biological and particulate materials. When confined, a high dispersed phase volume fraction emulsion, i.e. gel emulsion, will self-organize into well-defined arrangements. The possible arrangements are dependent on the droplet size and the length-scale of the confining geometry. In this work, we have studied the organization of monodisperse gel emulsions in microchannels for application in microfluidic processing. The high degree of spatial order exhibited by gel emulsions facilitates the precise manipulation of a droplet, or group of droplets, using geometry alone.

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