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Success Rate Comparison of Sitting Drop Vapor Diffusion and Microfluidics Free-Interface Diffusion Crystallization. T.P. Legin, B.W. Segelke, Biology and Biotechnology Program, Lawrence Livermore National Laboratory, Livermore CA 94551.

We have carried out a series of experiments with the intent to conduct a head-to-head comparison of a commonly used crystallization method in many labs, sitting drop vapor diffusion, with a new technology for nano-crystallization, microfluidics free-interface diffusion. It is apparent that microfluidics free-interface diffusion (FID) requires far less material per experiment but it is not known how success rates of this method compare with more traditional methods. It could be for instance that substantially fewer crystals are observed per experiment requiring more experiments and lessening the benefit of material savings realized with microfluidics FID. We setup a large number of crystallization experiments for each of 5 proteins using our existing automated sitting drop vapor diffusion approach and with microfluidics free-interface diffusion using the Fluidigm Topaz system. Trial crystallization conditions were generated by random combination using our CRYSTOOL design engine. The results of the comparison are quite dramatic and indicate that the success rate of crystallization is substantially higher for microfluidics free-interface diffusion.

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