Abstract Submitted
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Highly Oriented Neurofilament Liquid Crystalline Gels for Imaging and Scattering Studies H.C. HOLGER, R. BECK, C. DING, J.B. JONES, J. DEEK, N.C. MACDONALD, Y. LI, C.R. SAFINYA, UC Santa-Barbara — The neuronal cytoskeleton is composed of a variety of filamentous proteins including, neurofilaments (NFs), microtubules (MTs) and actin. These components form networks that maintain the cell's structure and shape. At high filament concentration, the proteins self-assemble in-vitro and form liquid crystalline phases maintained by their spatial anisotropy and interfilament interactions. Under physical confinement in microchannel with widths less than few persistence lengths, both MT and actin bundles align parallel to the surface[1]. AFM imaging shows that despite being shorter and more flexible filamentous protein, NF networks maintain larger oriented domains over much longer length scales and unexpectedly align perpendicular to the microchannel walls[2]. We discuss the extended orientation order in NFs in terms of the inter-filaments interactions originating from their polyampholyte side-chains. Supported by DOE DE-FG-02-06ER46314, NSF DMR-0803103, and the Human Frontier Science Program organization. [1] N.F.Bouxsein *et al.*, APL **85** (2004) 5775; L.S.Hirst *et al.* Langmuir **21** (2005) 3910 [2] H.C.Hesse, R.Beck, J.Deek *et al.* Langmuir **24** (2008) 8397

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