

Abstract Submitted  
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**Synchrotron X-ray Diffraction Study of Neurofilament Networks Interaction under Osmotic Pressure**<sup>1</sup> R. BECK, J. DEEK, J.B. JONES, H. HESSE, M.C. CHOI, C.R. SAFINYA, UC Santa-Barbara — Neurofilaments (NFs) are cytoskeletal proteins, which are found abundantly in nerve cell axons and impart mechanical stability and act as structural scaffolds for microtubules. The filaments assemble from 3 different subunit proteins to form a 10 nm diameter flexible polymers with radiating unstructured sidearms. At high protein concentration, the NFs form a nematic hydrogel network with a well-defined interfilament spacing as measured by synchrotron small angle x-ray scattering (SAXS) [1]. Here, NFs purified from bovine spinal cord are reassembled in vitro. Using analogous SAXS-osmotic pressure techniques [2] we study forces between NFs and directly probe the polyampholyte brush interactions between NF sidearms. We measure the interfilament spacing at different osmotic pressure, salt and sidearm concentrations. The study reveals the non-trivial electrostatic nature of the interfilament interaction within the NF hydrogel. [1] J. Jones, C.R. Safinya (submitted) [2] D. J. Needleman et al., PRL 93, 198104 (2004)

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Roy Beck  
UC Santa-Barbara

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