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**From Layers to Spheres — Shear-Induced Structural Transformations
in Lyotropic Lamellar Phases**

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The lyotropic lamellar L_α phase, which is found in many surfactant solutions, is usually considered to consist of stacks of extended parallel layers. However, the application of shear may lead to defect structures consisting of close-packed multilamellar vesicles, also known as onions. The formation of these multilamellar vesicles can be detected, for example, by changes in the rheological properties of a lamellar sample. In this seminar details of the structural changes and their reversibility, investigated mainly by NMR spectroscopy and diffusometry, will be presented. Especially the intermediate structures which occur during the transformation of extended layers into multilamellar vesicles will be discussed.