

FIGURE 33.1 Schematic representation of amyloid fibrils revealed by total internal reflection fluorescence microscopy. The penetration depth of the evanescent field formed by the total internal reflection of laser light is about 150 nm for a laser light at 455 nm, so that only amyloid fibrils lying in parallel with the slide glass surface were observed. (From [20], with permission of Elsevier.)

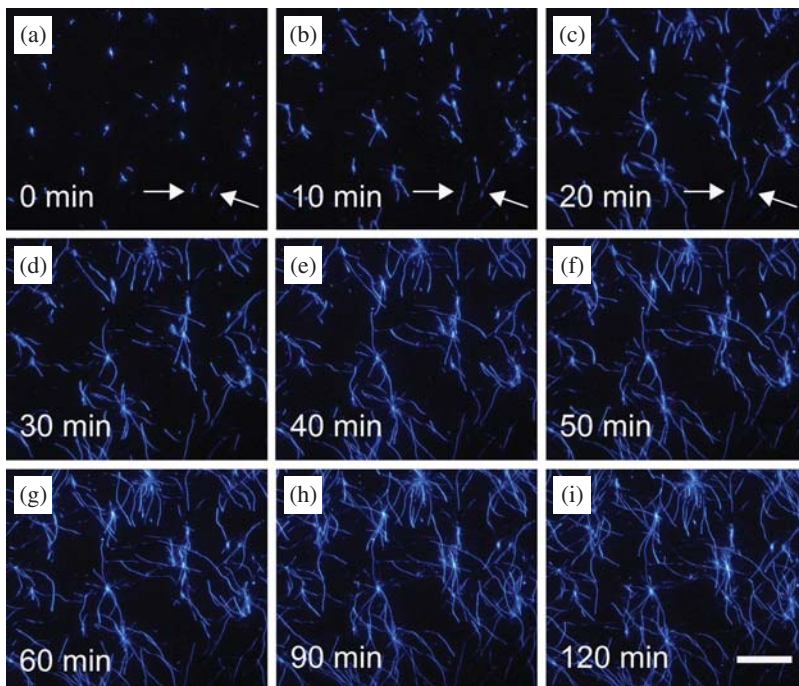


FIGURE 33.2 Direct observation of A β (1–40) amyloid fibril growth by TIRFM. Real-time monitoring of fibril growth on glass slides. Arrows indicate the unidirectional growth of A β from a single seed fibril. The scale bar represents 10 μ m. (From [19], with permission of Elsevier.)

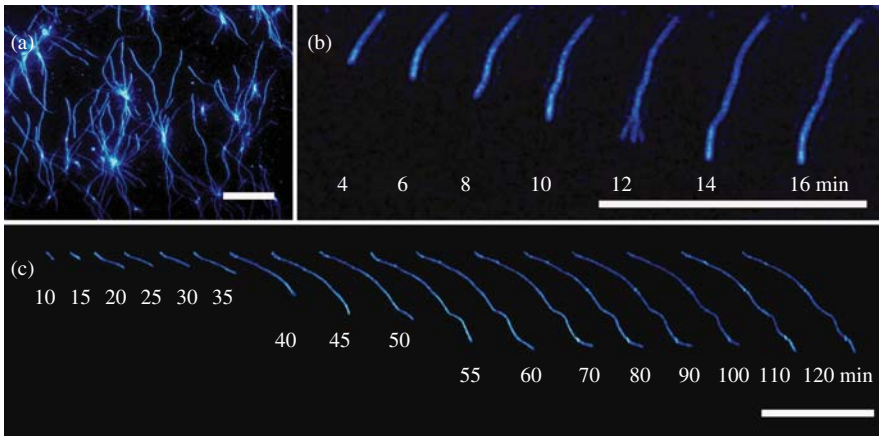


FIGURE 33.3 Characteristic images of Aβ(1–40) amyloid fibril growth revealed by TIRFM: (a) vertically aligned image of fibrils; (b) growth with transient fraying of the growing end at 12 minutes; (c) growth with a swinging head producing a rugged fibril. The scale bars are 10 μm. (From [19], with permission of Elsevier.)

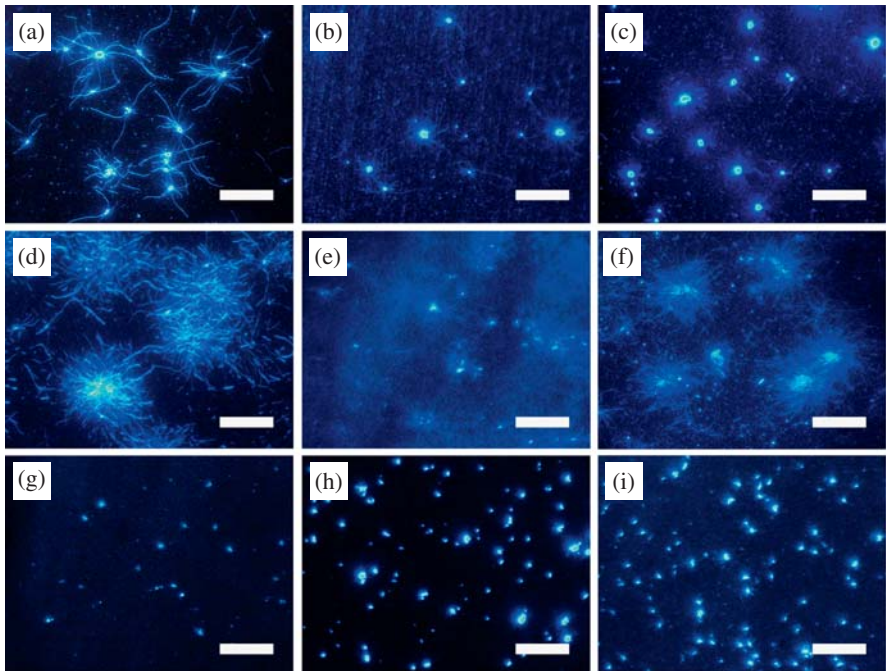


FIGURE 33.4 Surface-dependent growth of A β (1–40) amyloid fibrils. Seed-dependent growth was performed on various surfaces: (a) quartz; (b) negatively charged CDDS; (c) negatively charged APTS/PVS; (d) negatively charged PEI/PVS; (e) negatively charged PEI/PSS; (f) negatively charged PEI/PAA; (g) hydrophobic OTS; (h) positively charged APTS; (i) positively charged PEI. Concentrations of A β (1–40) monomers, seeds, and ThT were 50 μ M, 5 μ g/mL, and 5 μ M, respectively. The scale bar represents 10 μ m. Extensive fibril growth was observed on the surfaces with negative charges (a–f), while the formation of fibrils was suppressed on hydrophobic (g) or positively charged (h, i) surfaces. (From [22], with permission. Copyright © 2006 American Society for Biochemistry and Molecular Biology.)

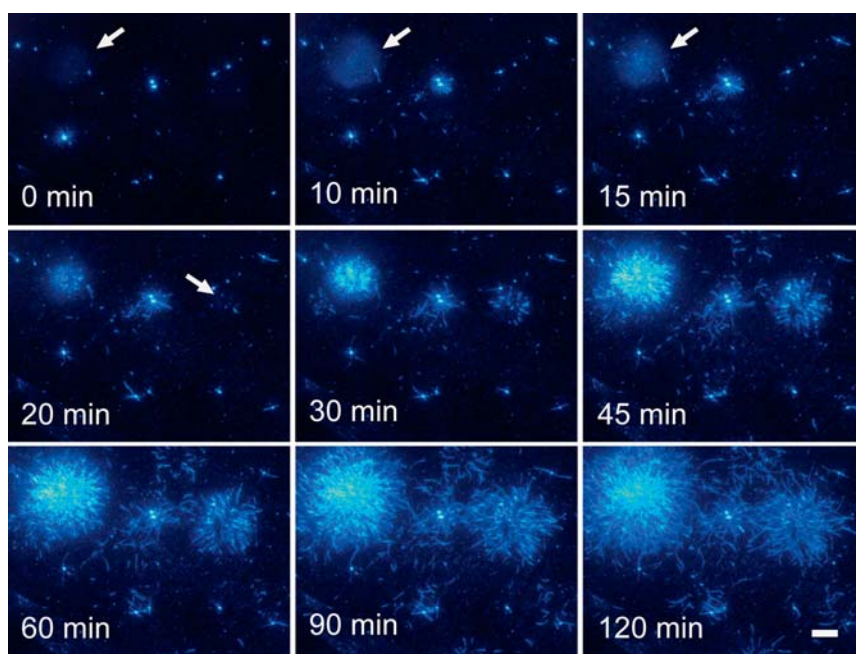


FIGURE 33.5 Real-time observations of the formation of A β (1–40) spherulite. Real-time observations of A β (1–40) amyloid fibril growth on PEI/PVS at pH 7.5 and 37°C. Concentrations of A β (1–40) monomers, seeds, and ThT were 50 μ M, 5 μ g/Ml, and 5 μ M, respectively. White arrows in panels of 0 to 20 minutes indicate the hazy area detected before clear images of spherical amyloid fibrils were obtained. At time zero, large clusters were not observed on the surface. At 10 minutes, hazy globular objects were identified. At 15 minutes, fibrils emerged. Fibrils grew both in size and number with time, forming huge spherical amyloid assemblies with a radius of more than 20 μ m at 120 minutes. (From [22], with permission Copyright © 2006 American Society for Biochemistry and Molecular Biology.)