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Polypeptide Chirality Influences Multilayer Thin Film Growth and Structure ZEPHRA BELL, DHAN KHADKA, DONALD HAYNIE — Polypeptide multilayer thin films are being developed for a variety of applications.These include coatings for implant devices and systems for drug delivery in thebiomedical sciences, and optical coatings. Subsequent polymer adsorption steps involve polymers of opposite polarity. Here, the polymers were polypeptides. This project compared the consequences of changing polypeptide chirality on film growth and structure. The peptides were poly(L-glutamic acid), its right-handed counterpart, poly(D-glutamic acid), and poly(lysine-tyrosine). The first two are negatively charged at neutral pH, the third one is positively charged. Poly(lysine-tyrosine)/poly(L-glutamic acid) films and poly(lysine-tyrosine)/poly(D-glutamic acid) films werefabricated on 1 mm-thick quartz plates. In one experiment, films were grown to 34layers. The UV absorption spectrum was taken after each layer deposited to determinethe rate of polymer self-assembly. Separately, UV or visible wavelength spectra wereobtained for films stained with a dye cooled/heated in the range 4-65 $^{\circ}$C. In anotherexperiment, a mixture of poly-L-glutamic acid and poly-D-glutamic acid was used as thepolyanion for film buildup. The data show that poly(lysine-tyrosine)/poly(L-glutamicacid) films built up at a higher rate than the corresponding right-handed films.

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