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Protein nanofibrils and nanotubes are now widely accepted as having potential for use in the field of bionanotechnology. For this to be a feasible alternative to existing technologies, there is a need for a commercially viable source. Previous work has identified amyloid fibrils formed from crude crystallin proteins as such a source, since these fibrils can be produced in large quantities at a low cost. Applications include use of fibrils as templates for the formation of nanowires or as biosensing scaffolds. There remains a number of practical considerations, such as stability and the ability to control their arrangement. In this study, crude crystallin amyloid fibrils are shown to be stable in a range of biological and clean room solvents, with the fibril presence confirmed by transmission electron microscopy and the thioflavin T fluorescent assay. The fibrils were also immobilised between microelectrodes using dielectrophoresis, which enabled the recording of I–V curves for small numbers of fibrils. This investigation showed the fibrils to have low conductivity, with current values in the range of 10−10 A recorded. This low conductivity could be increased through modification, or alternately, the fibrils could be used unmodified for applications where they can act as templates or high surface area nanoscaffolds.

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