

Figure S3. PEDOT:PSS fibers spun using different weight % of the dope solution with the same gauge needle.

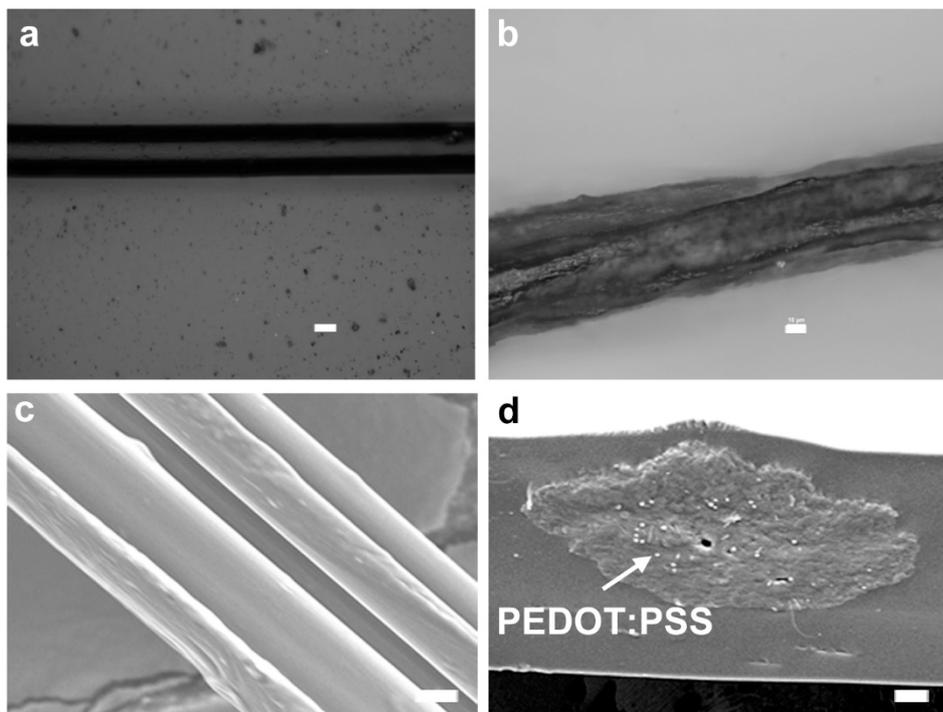


Figure S4. a, b. Optical images showing the fibers and the cross-section. **c, d** SEM images. Scale bar = 10 μm on all panels.

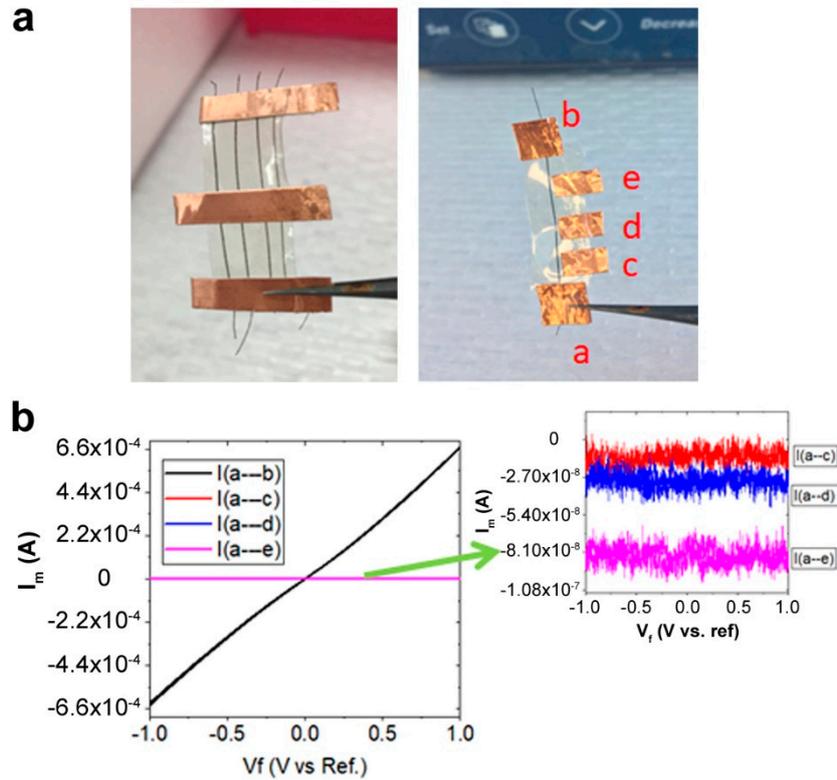


Figure S5. Testing the insulation efficacy of the silk fibroin sheath. (a), The conductivity was tested along the sheathed fiber at different points and also across different points. For instance, **a–b** measures the conductivity along the fiber, whereas **a–c** measures the conductivity from the fiber to the insulating surface. Conductive properties are maintained along the fiber, while the surface itself does not show any conductivity or leakage.

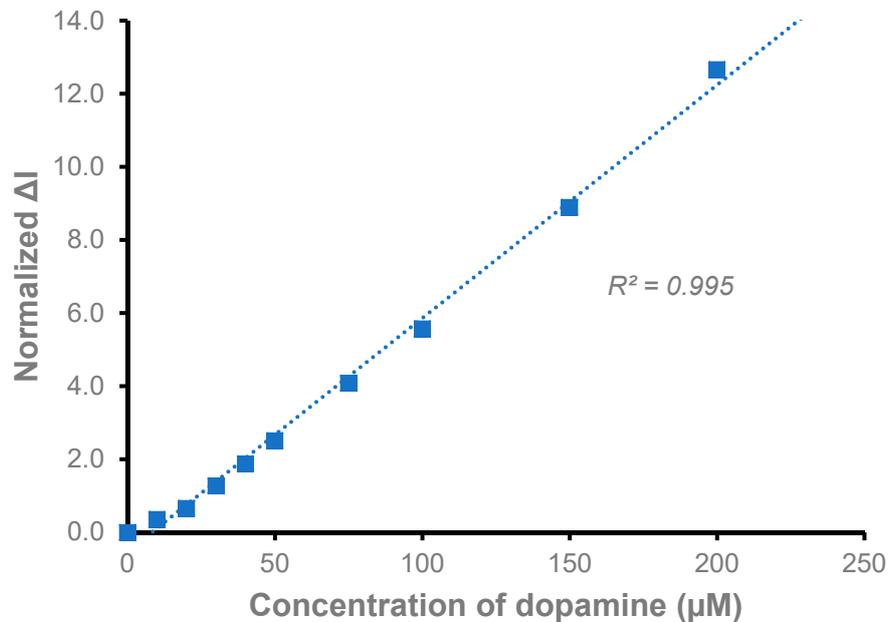


Figure S6. Response of the fully integration biosensor device to additions of the neurotransmitter dopamine. A chronoamperometric setup was used to detect the analyte within the physiological range, showing a linear calibration curve.