

**Figure S4.** Local administration of 4-AP in PLGA particles or films enhances functional and electrophysiological recovery after sciatic nerve crush. (A) Local 4-AP treated crushed sciatic nerve (black: vehicle PLGA films; red: (4-AP)-PLGA films; blue: (4-AP)-PLGA particles) regained partial walking ability as early as 3 days post-injury compared to vehicle treated group. (\*:p < 0.05; \*\*:p < 0.01, two-tailed unpaired t-test; N=6 for each group). (B) Local 4-AP treated crushed sciatic nerve (black: vehicle PLGA films; red: (4-AP)-PLGA films; blue: (4-AP)-PLGA particles) showed faster improvement in nerve conduction velocity restoration compared with vehicle-treated mice, beginning at 21 days post-injury. In addition, mice treated with the higher dosage 4-AP containing films showed greater improvement than mice treated with the lower dosage of local 4-AP-containing particles. (\*:p < 0.05; \*\*:p < 0.01; two-tailed unpaired t-test: N=6 for each group).

