**Expanded View Figures**

**Figure EV1.** 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; ANOVA with post hoc comparisons using 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; ANOVA with post hoc comparison using two-tailed unpaired t-test: n = 6 for each group).

Data information: Data are presented as mean ± SEM and show a representative experiment from 2 to 3 repetitions.