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**Supplemental Digital Content 1. Efficiently and specifically knocked-down Brd4 expression in DRG of naïve rats**

Representative Western blot and statistical analysis (normalized to GAPDH) demonstrating that administration of Brd4-specific siRNA (Brd4 RNAi; 10 μL; 1, 3, and 5 μg; once daily for 4 days), but not missense siRNA (MS RNAi, 10 μL, 5 μg), polyethylenimine (PEI, a transfection reagent, 10 μL), or intrathecal puncture (it), led to a dose-dependent decrease in Brd4 levels in the DRG of naïve rats. IB, Immunoblotting. \*P<0.05, \*\*P<0.01 vs. Naïve. n=6.

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**Supplemental Digital Content 2. Motor response in naïve rats after knocked-down Brd4 expression in DRG**

Application of Brd4-specific siRNA (Brd4 RNAi, 10 μL 5 μg) resulted in no motor deficits in rats (rotarod test). The grey bar at the bottom indicates the duration of intrathecal administration. n=7.

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**Supplemental Digital Content 3. Paw withdrawal latency of saline-treated ratsafter knocked-down Brd4 expression in DRG**

Brd4-specific siRNA (Brd4 RNAi+CFA 1d, 10 μL, 5 μg) exhibited no effect on the paw withdrawal latency (PWL) in saline-treated rats (Brd4 RNAi+Saline 1d, 10 μL, 5 μg). n=7.

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**Supplemental Digital Content 4. Paw withdrawal latency of saline-treated rats after injection with JQ1**

Injection with JQ1 (Saline 1d+JQ1; 10 μL; 100 μM) exhibited no effect on the paw withdrawal latency in saline-treated rats. n=7.

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**Supplemental Digital Content 5. Paw withdrawal latency of CFA-treated rats at day 5 and day 10 after injection with JQ1**

Injection with JQ1 (10 μL; 100 μM) attenuated the behavioral hyperalgesia in CFA-treated rats at day 5 and day 10. \*\*P <0.01 vs. CFA 5d. ##P<0.01 vs. CFA 10d. n=7.

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**Supplemental Digital Content 6. Brd4, CDK9, and Nav1.7 immunoreactivity colocalized in DRG slices of CFA 1d rat**

Image analysis showing colocalization of Brd4-, CDK9-, and Nav1.7-positive immunofluorescence in CFA rat DRG neurons (CFA 1d). Scale bar=50 μm. Thickness=16 μm. n=7

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**Supplemental Digital Content 7. Efficiently and specifically knocked-down CDK9 expression in DRG of naïve rats**

Representative Western blot and statistical analysis (normalized to GAPDH) demonstrating that administration of CDK9-specific siRNA (CDK9 RNAi; 10 μL; 1, 3, and 5 μg; once daily for 4 days), but not missense siRNA (MS RNAi, 10 μL, 5 μg), polyethylenimine (PEI, a transfection reagent, 10 μL), or intrathecal puncture (it), led to a dose-dependent decrease in CDK9 levels in naïve rat DRG. IB, Immunoblotting. \*P<0.05, \*\*P<0.01 vs. Naïve. n=6.

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**Supplemental Digital Content 8. Motor response in naïve rats after knocked-down CDK9 expression in DRG**

Application of CDK9-specific siRNA (CDK9 RNAi; 10 μL, 5 μg, once daily for 4 days) results in no motor deficits in rats (rotarod test). The grey bar at the bottom indicates the duration of intrathecal administration. n=7

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**Supplemental Digital Content 9. Paw withdrawal latency of saline-treated ratsafter knocked-down CDK9 expression in DRG**

CDK9-specific siRNA (CDK9 RNAi+Saline 1d, 10 μL, 5 μg) exhibited no effect on the paw withdrawal latency (PWL) in saline-treated rats. n=7.

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**Supplemental Digital Content 10. TNF-α-neutralizing antibody decreased Nav1.7 protein expression in DRGs of CFA rats**

Representative Western blot and statistical analysis (normalized to GAPDH) demonstrated that Nav1.7 expression in DRG of CFA rats was attenuated by a TNF-α-neutralizing antibody (CFA 1d+TNF-α Ab, 10 μL, 100 ng). \*\*P<0.01 vs. CFA 1d. n=6.

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**Supplemental Digital Content 11. TNF-α increased the abundances of Nav1.7 protein in DRG samples in naïve rats; that was reduced by Brd4- and CDK9-specific siRNA**

Representative Western blot and statistical analysis (normalized to GAPDH) demonstrating that TNF-α-(10 μL, 1 pM, i.t.) enhanced Nav1.7 protein expression in DRG was attenuated by administration of Brd4-specific siRNA (Brd4 RNAi+TNF-α, 10 μL, 5 μg) and CDK9-specific siRNA (CDK9 RNAi+TNF-α, 10 μL, 5 μg). \*\*P<0.01 vs. Naïve. ##P < 0.01 vs. TNF-α. n=6.

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**Supplemental Digital Content 12.**

***(A)*** The Brd4-Brd4, Brd4-RelA, and Brd4-RelA Ac co-precipitations in CFA rat DRG (CFA 1d). No detectable immunoreactivity was observed in the control IgG precipitation. In, input control. IP, immunoprecipitation. IB, Immunoblotting.

Brd4 (rabbit, 1:1000, Abcam, Cambridge, USA), RelA (rabbit, 1:1000, Santa Cruz Biotechnology, Santa Cruz, CA), and RelA Ac (rabbit, 1:1000, cell signaling, Danvers, USA). ***(B)*** Western blot analysis of DRG lysates of naïve rat. 1. Anti-Nav1.7 antibody (1:200, Alomone labs, Jerusalem, Israel). 2. Anti-Nav1.7 antibody, preincubated with the control peptide antigen. ***(C)*** RT-PCR’s RT activity.