Fig. S1

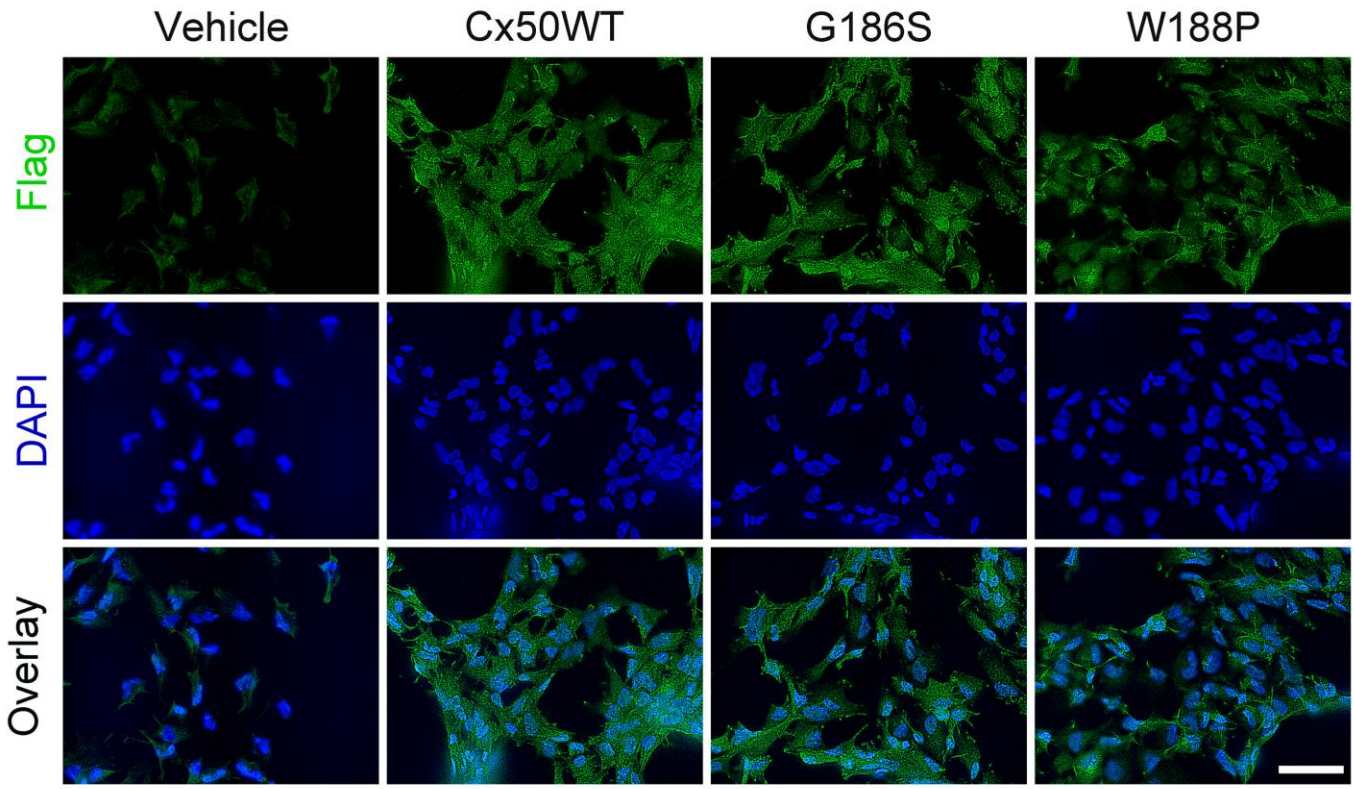

Figure S1. Infection efficiency of recombinant retroviruses expressing WT Cx50 and Cx50 E2 domain mutants in CLCs. Immunostaining was performed for exogenous Cx50 (Flag, green), with DAPI nuclear counterstaining (blue). Scale bar = 50 μm.

Fig. S2

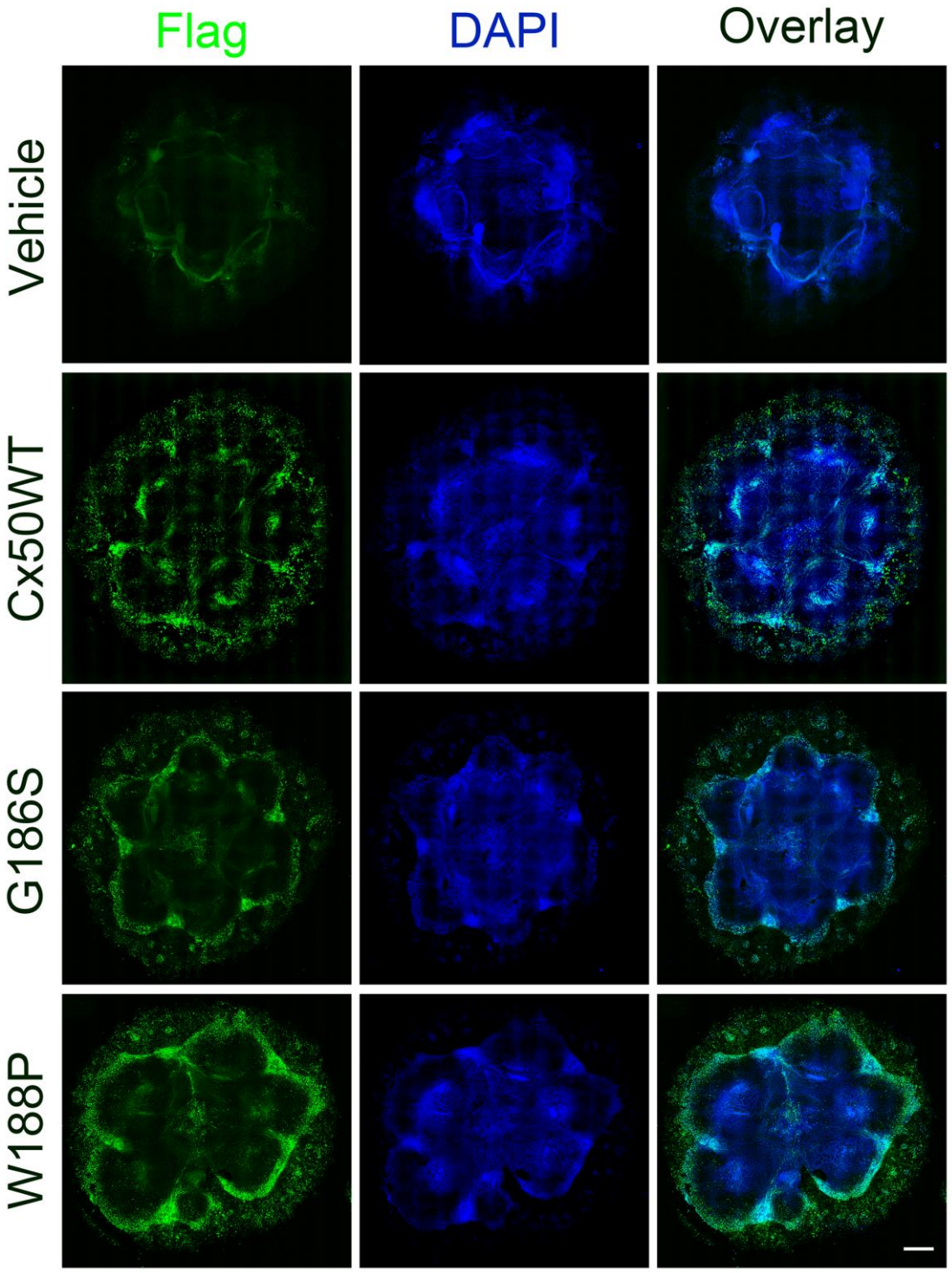

Figure S2. Infection of recombinant retroviruses expressing WT Cx50 and Cx50 E2 domain mutants in chick embryo lens capsular bag model. Immunostaining was performed for exogenous Cx50 (Flag, green), with DAPI nuclear counterstaining (blue). Scale bar = 500 μm.

Fig. S3

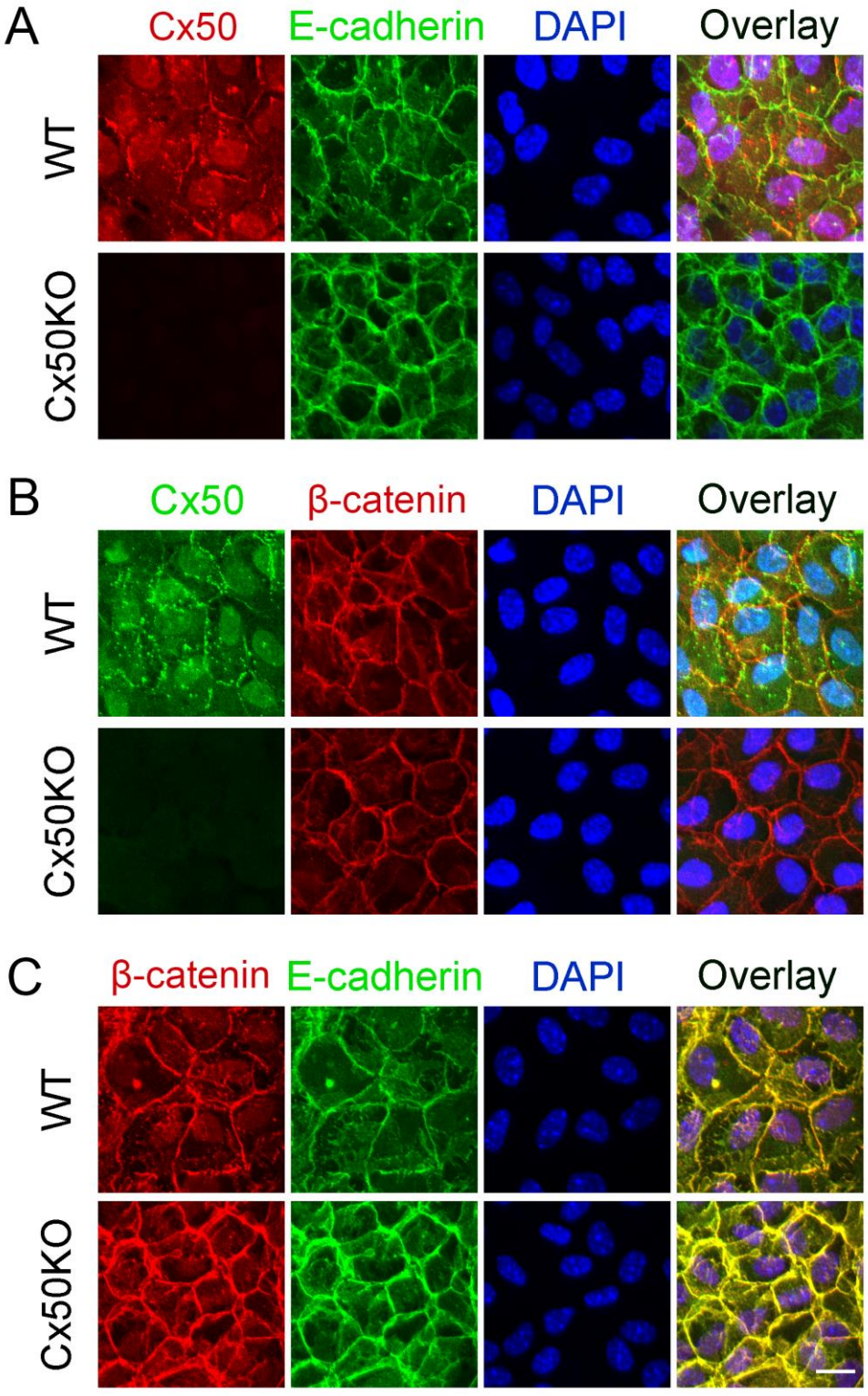

Figure S3. Co-localization of Cx50, E-cadherin, and β-catenin in CLCs. (A) Co-immunostaining for Cx50 (red), E-cadherin (green), with DAPI nuclear counterstaining (blue). **(B)** Co-immunostaining for Cx50 (green) and β-catenin (red), with DAPI nuclear counterstaining (blue). **(C)** Co-immunostaining for β-catenin (red) and E-cadherin (green), with DAPI nuclear counterstaining (blue). Scale bar = 10 μm.

Fig. S4

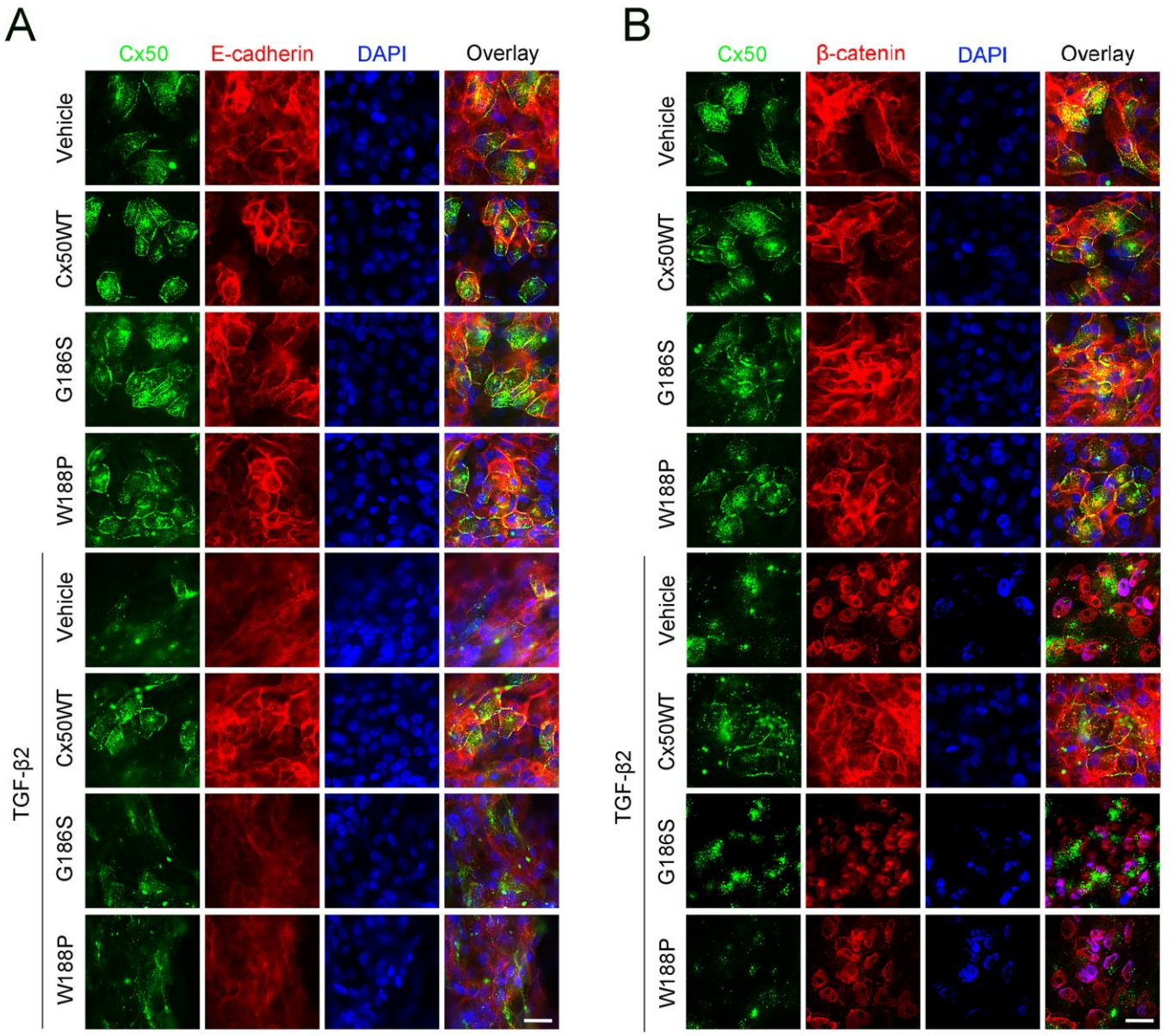

Figure S4. Cx50 inhibits E-cadherin loss and β-catenin nuclear localization mediated by the Cx50 E2 domain. **(A)** Primary chicken lens cell cultures were infected with recombinant retroviruses expressing WT Cx50 or the G186S and W188P mutants and treated with 10ng/mL TGF-β2. Co-immunostaining for Cx50 (green) and E-cadherin (red), with DAPI nuclear counterstaining (blue). Scale bar = 20 μm. **(B)** Co-immunostaining for Cx50 (green) and β-catenin (red), with DAPI counterstaining (blue). Scale bar = 20 μm.

Fig. S5

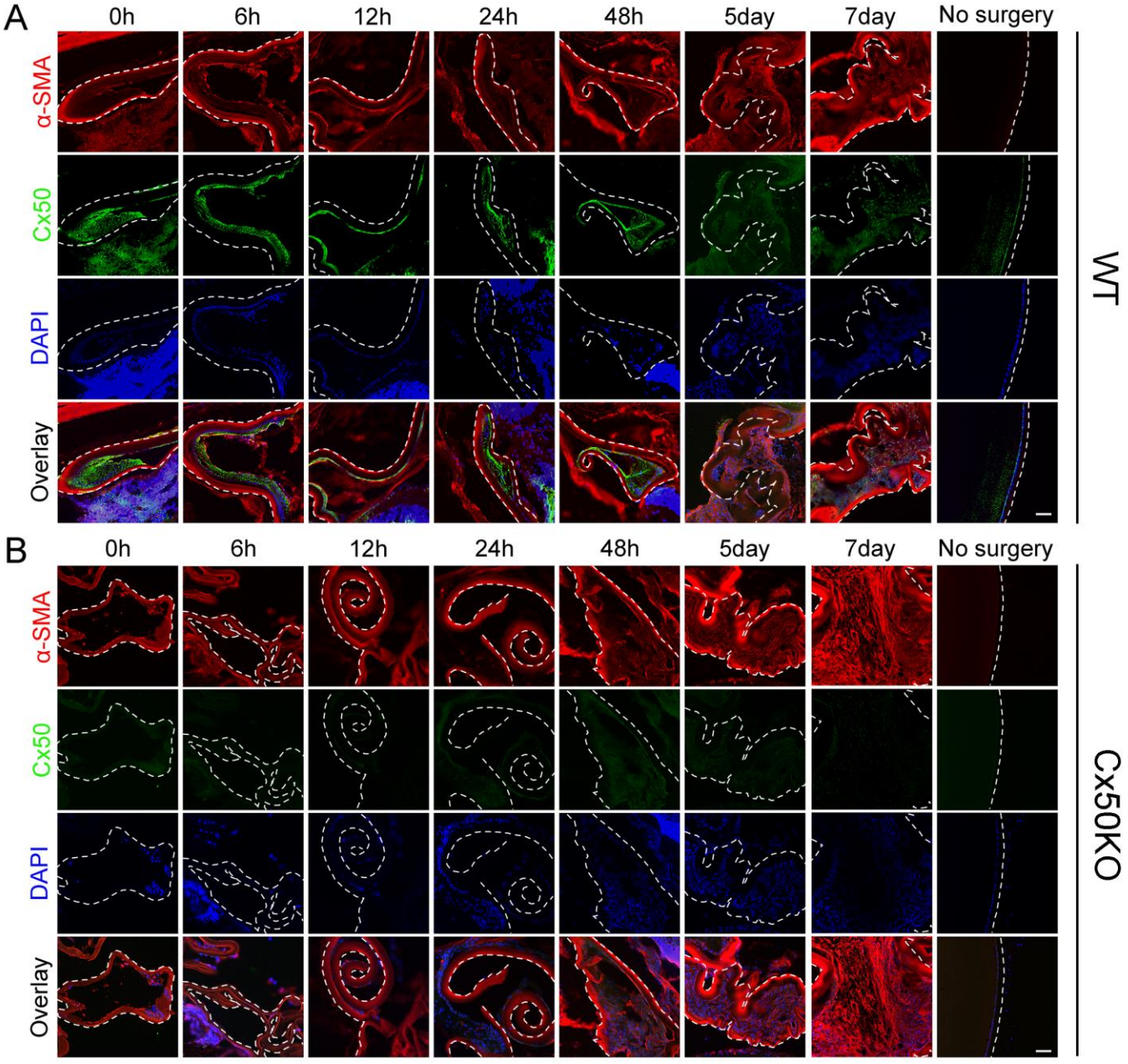

Figure S5. Deletion of Cx50 increases EMT marker expression in a PCO mouse model. (A) Co-immunostaining for Cx50 (green) and α-SMA (red) in WT mouse lenses, with DAPI nuclear counterstaining (blue). Scale bar = 50 μm. **(B)** Co-immunostaining for Cx50 (green) and α-SMA (red) in Cx50KO mouse lenses, with DAPI nuclear counterstaining (blue). Scale bar = 50 μm. White dashed lines outline the capsule.

Fig. S6

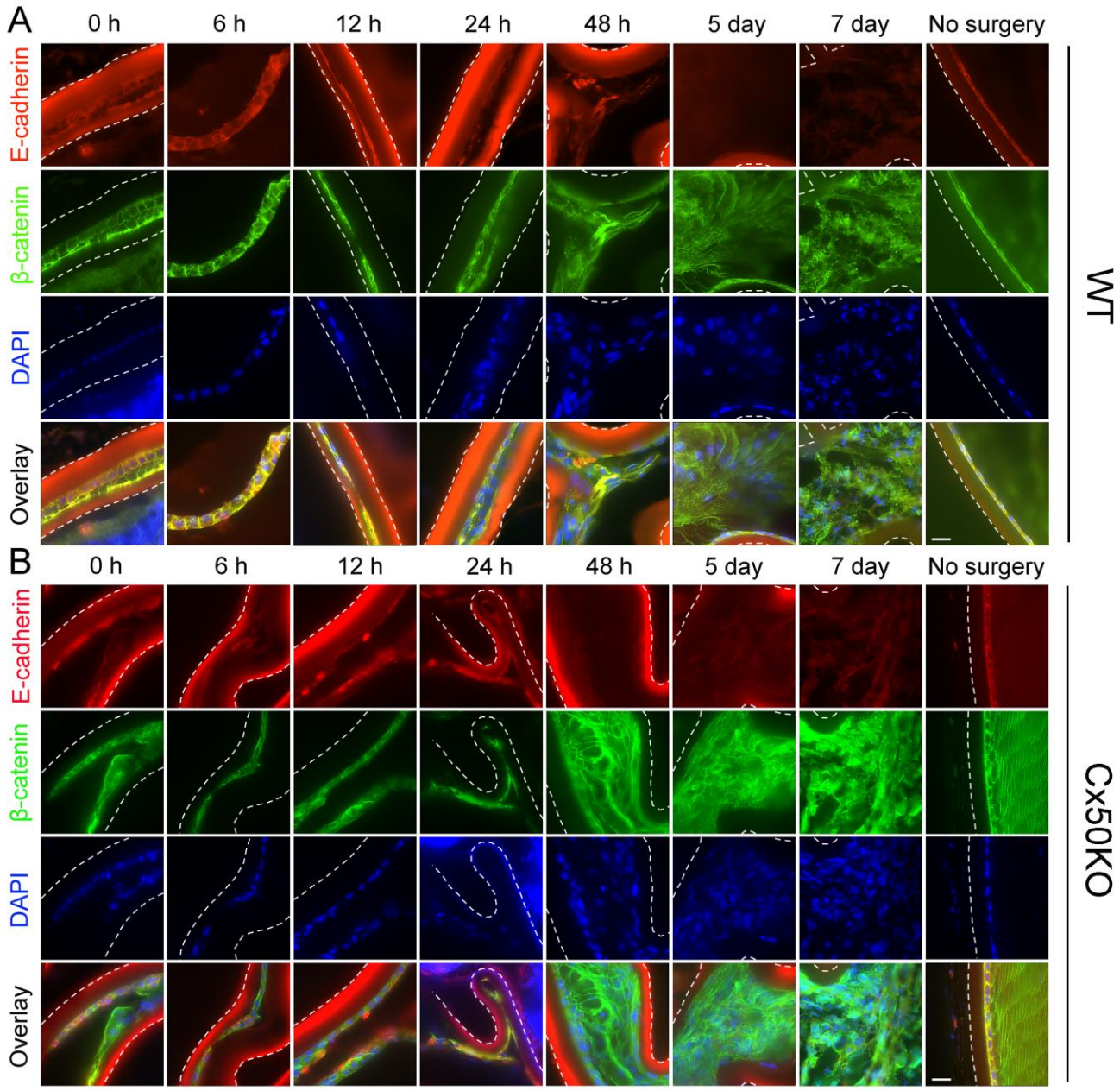

Figure S6. Deletion of Cx50 increases E-cadherin loss and β-catenin nuclear localization in a PCO mouse model. (A) Co-immunostaining for β-catenin (green) and E-cadherin (red) in WT mouse, with DAPI nuclear counterstaining (blue). Scale bar = 20 μm. **(B)** Co-immunostaining for β-catenin (green) and E-cadherin (red) in Cx50 KO mouse, with DAPI nuclear counterstaining (blue). Scale bar = 20 μm. White dashed lines outline the capsule.

Fig. S7

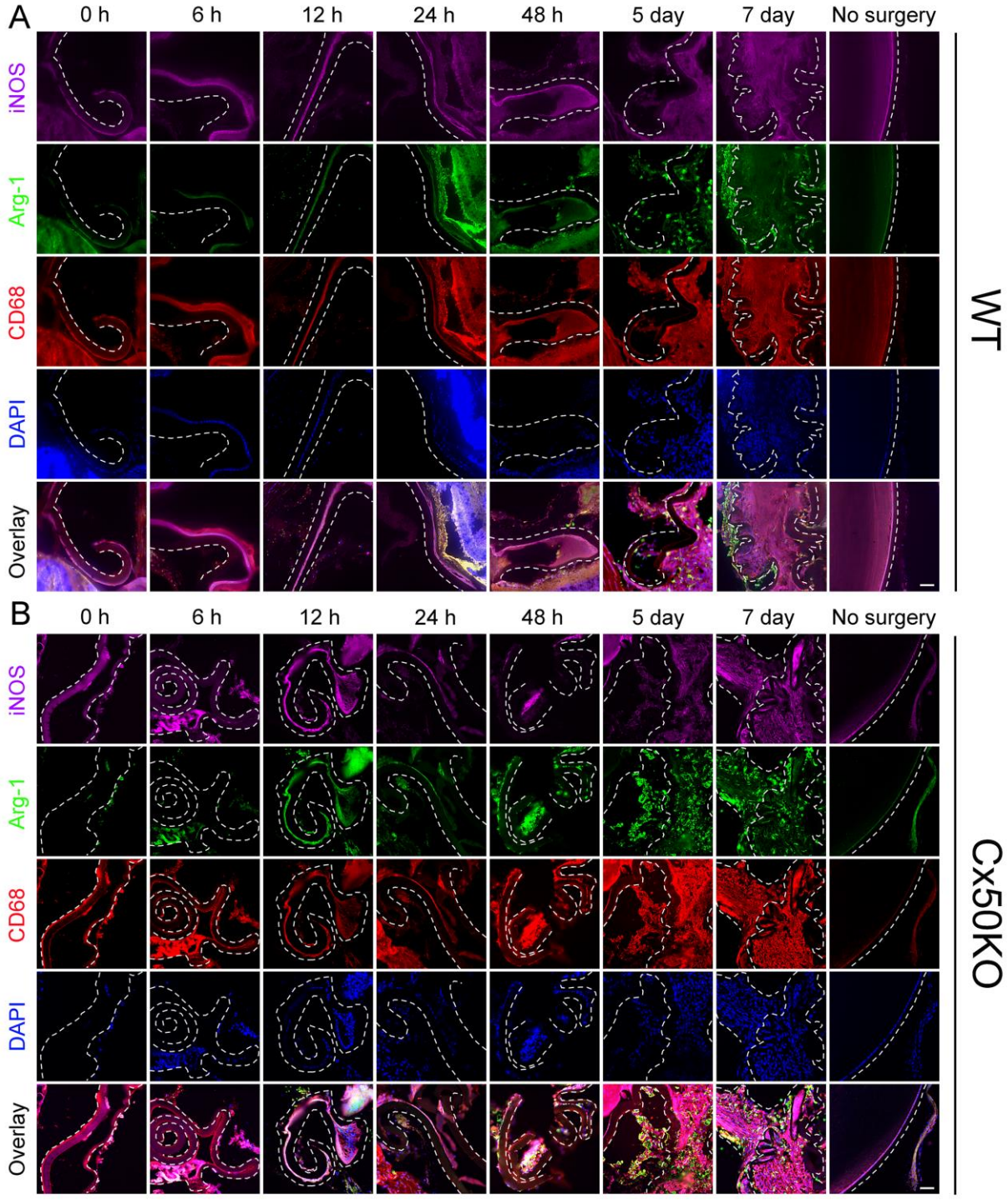

Figure S7. Deletion of Cx50 increases macrophages recruitment in a PCO mouse model. (A) Co-immunostaining for iNOS (purple), Arg-1 (green), and CD68 (red) in WT mouse lenses, DAPI nuclear counterstaining (blue). Scale bar = 50 μm. **(B)** Co-immunostaining for iNOS (purple), Arg-1 (green), and CD68 (red) in Cx50KO mouse lenses, with DAPI nuclear counterstaining (blue). Scale bar = 50 μm. White dashed lines outline the capsule.

Fig. S8

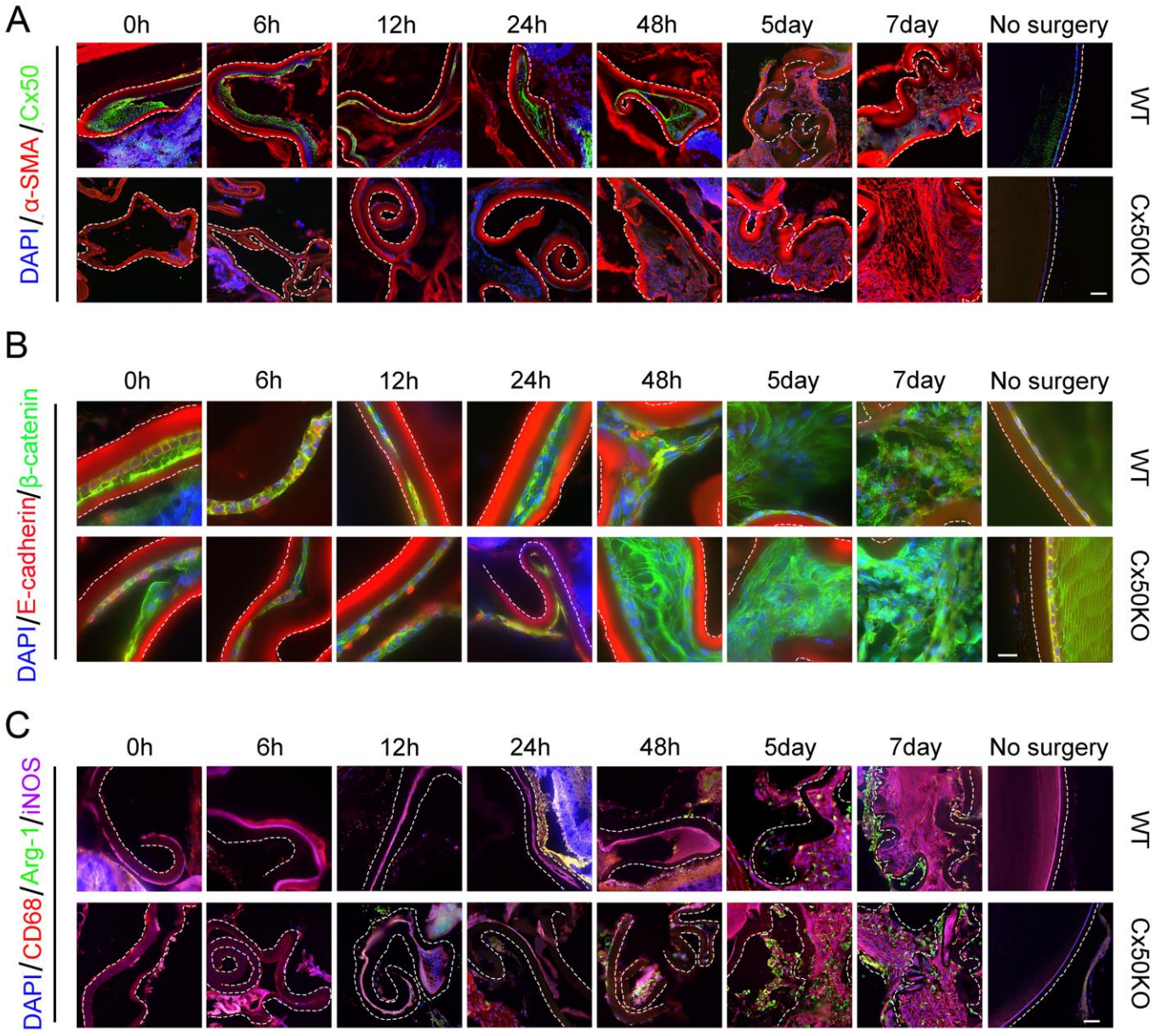

Figure S8. Deletion of Cx50 increases EMT marker expression, E-cadherin loss, β-catenin nuclear localization, and macrophage recruitment in an *in vivo* PCO mouse model. ECCE surgery was performed on WT and Cx50 KO to mimic PCO, and images were captured at various time points pos-surgery. **(A)** Co-immunostaining for Cx50 (green) and α-SMA (red), with DAPI nuclear counterstaining (blue). Scale bar = 50 μm. **(B)** Co-immunostaining for β-catenin (green) and E-cadherin (red), with DAPI nuclear counterstaining (blue). Scale bar = 20 μm. **(C)** Co-immunostaining for iNOS (purple), Arg-1 (green), and CD68 (red), with DAPI nuclear counterstaining (blue). Scale bar = 50 μm. White dashed lines outline the capsule.