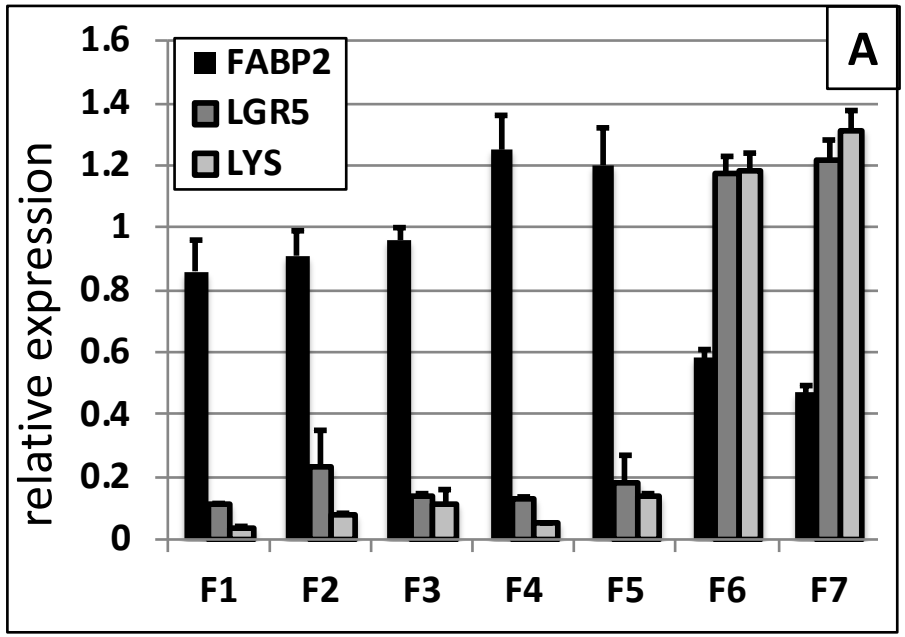
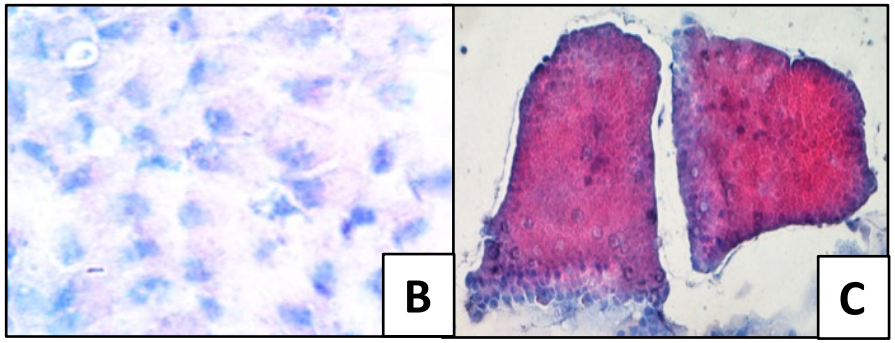
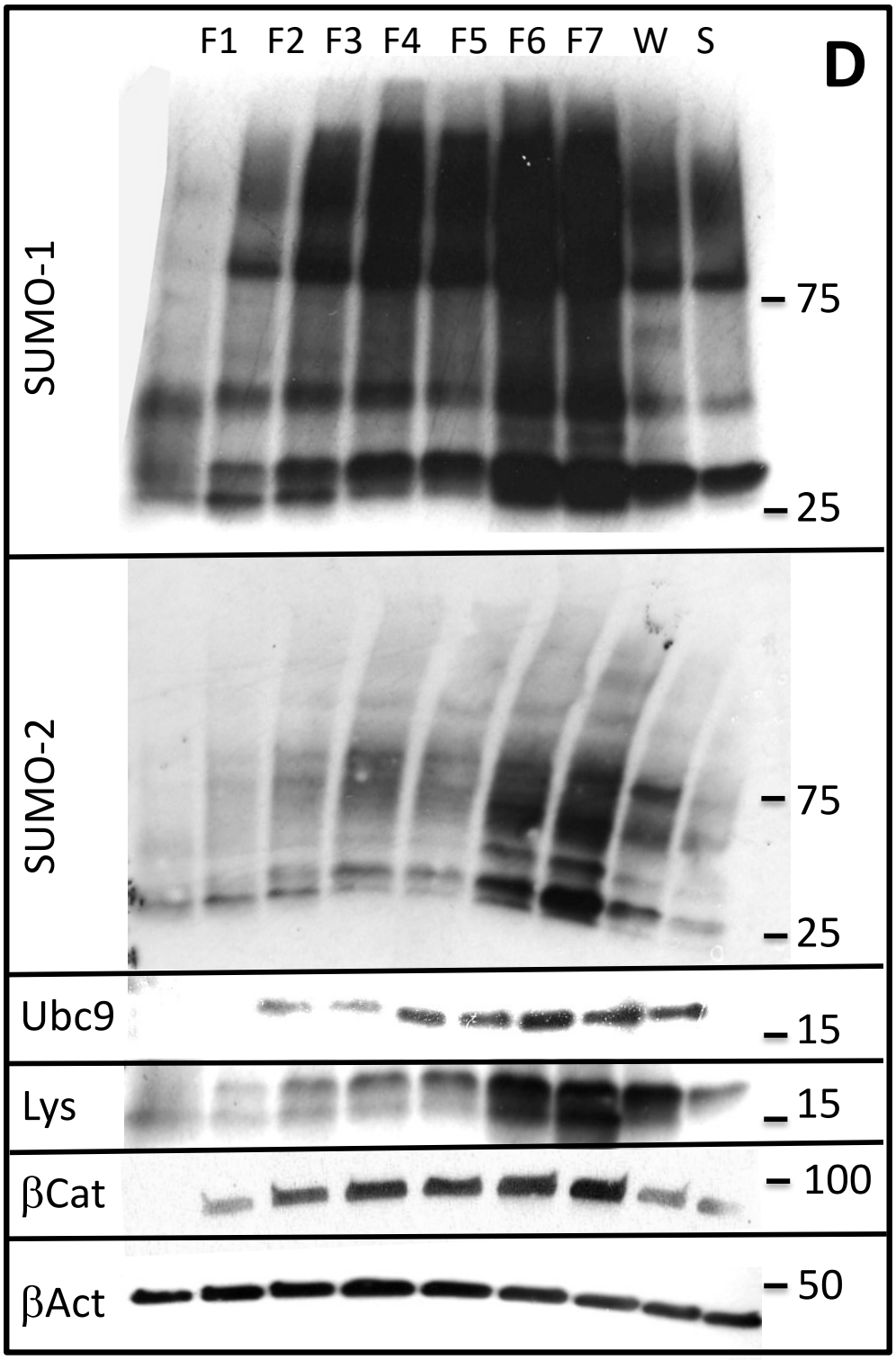
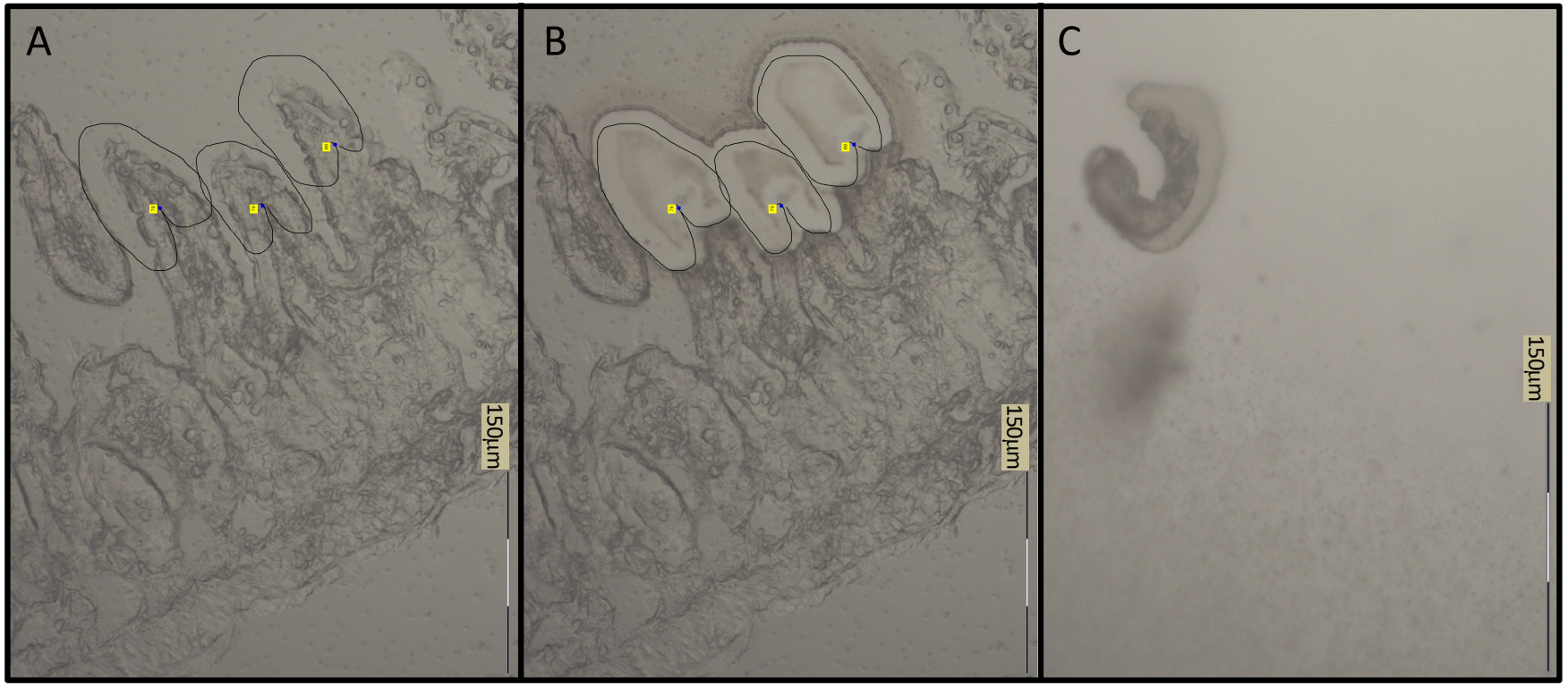


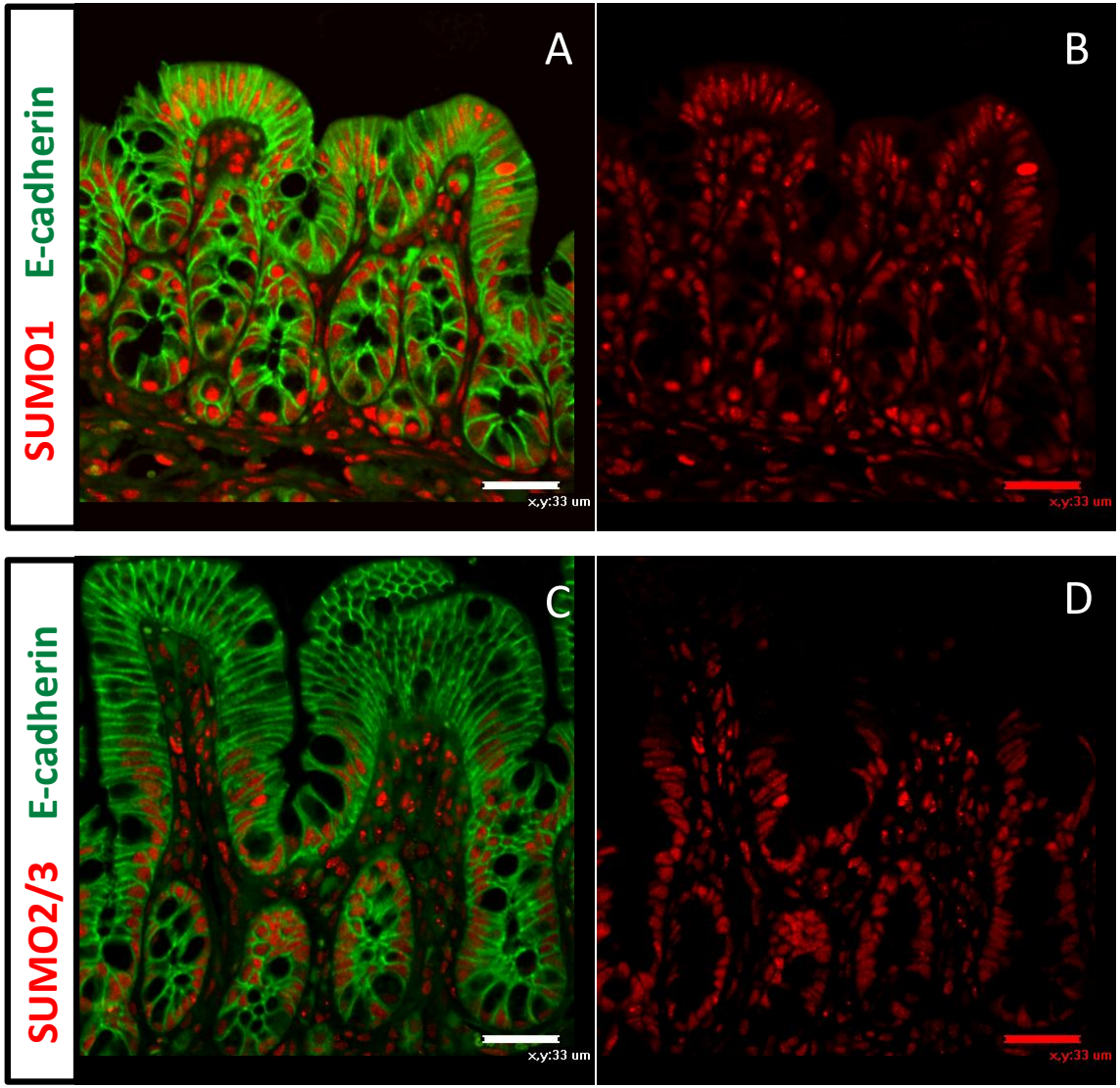




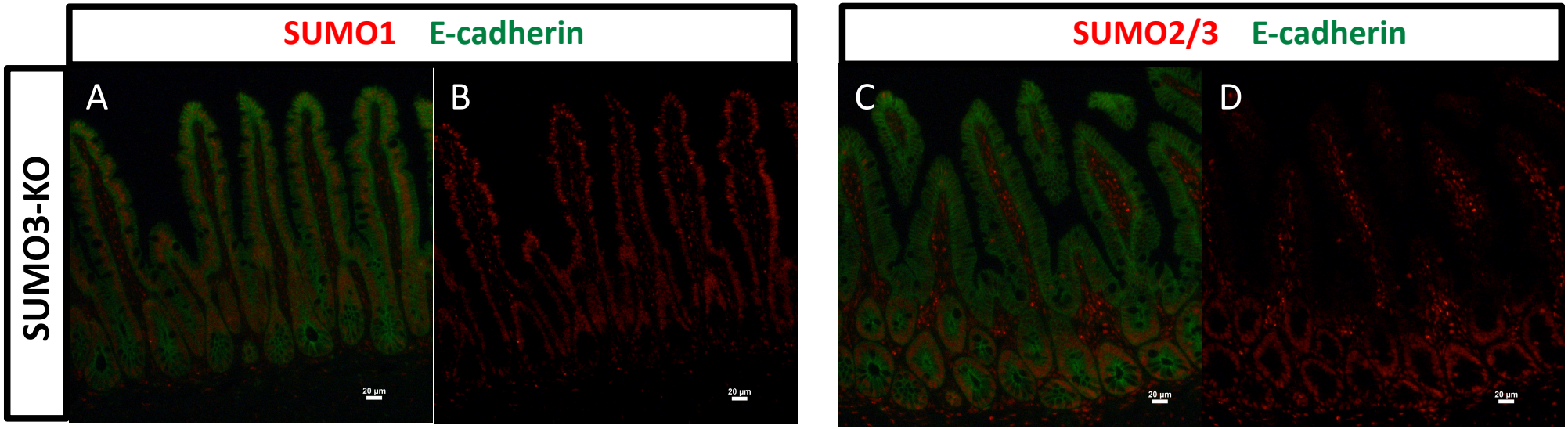
Supplemental Figure 1: Analysis of epithelial fractions from murine small intestines. (A) The small-intestinal epithelial layer was isolated in fractions along the crypt-villus axis, RNA was isolated and RT-qPCR performed using primers for intestinal fatty acid binding protein (FABP2), Leucine-rich repeat-containing G-protein coupled receptor 5 (LGR5) or lysozyme (LYZ) each normalized to βActin as internal control. Fractions were designated in a villus tip to crypt direction F1-7. Representative H&E staining of fraction 1 **(B)**, and fraction 7 **(C)**. Magnification 400x **(D)** The small-intestinal epithelial fractions were analyzed by Western blotting using specific antibodies directed against SUMO1, SUMO2/3, Ubc9, Lysozyme (Lys), βCatenin (βCat) and βActin (βAct). Fractions were compared to lysates from whole small intestine (W) or small intestinal mucosal scrapings (S). Markers denote molecular weight in kilo Dalton.



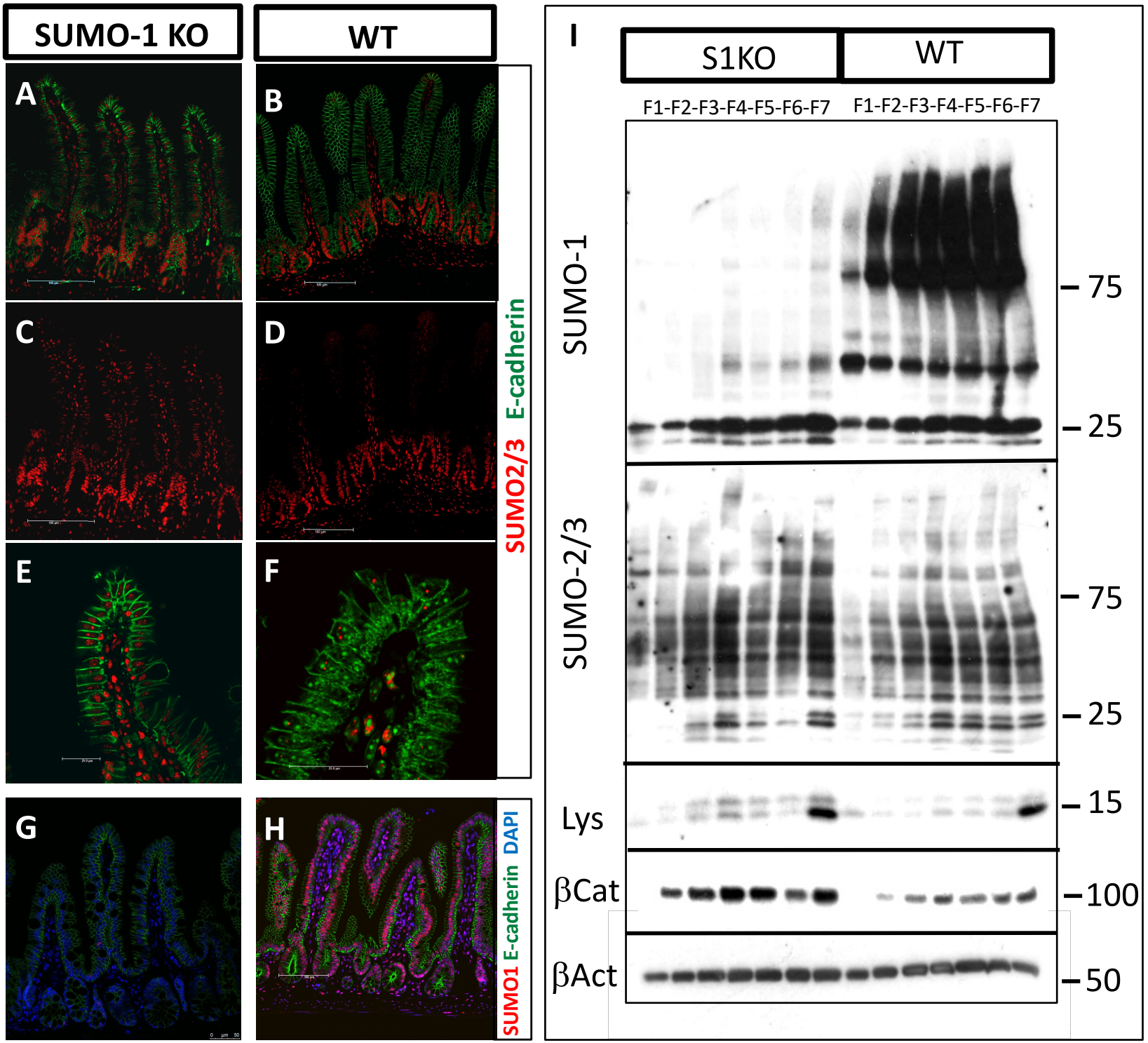
Supplemental Figure 2: Laser microdissection and capture of intestinal epithelial villus tip epithelia. Brightfield images of deparafinized sections from post-ischemic small intestinal samples: **(A)** before microdissection with markings denoting the cutting path, **(B)** after microdissection and capture, and **(D)** captured villus tip sample. Magnification 200x in A and B and 400x in C.



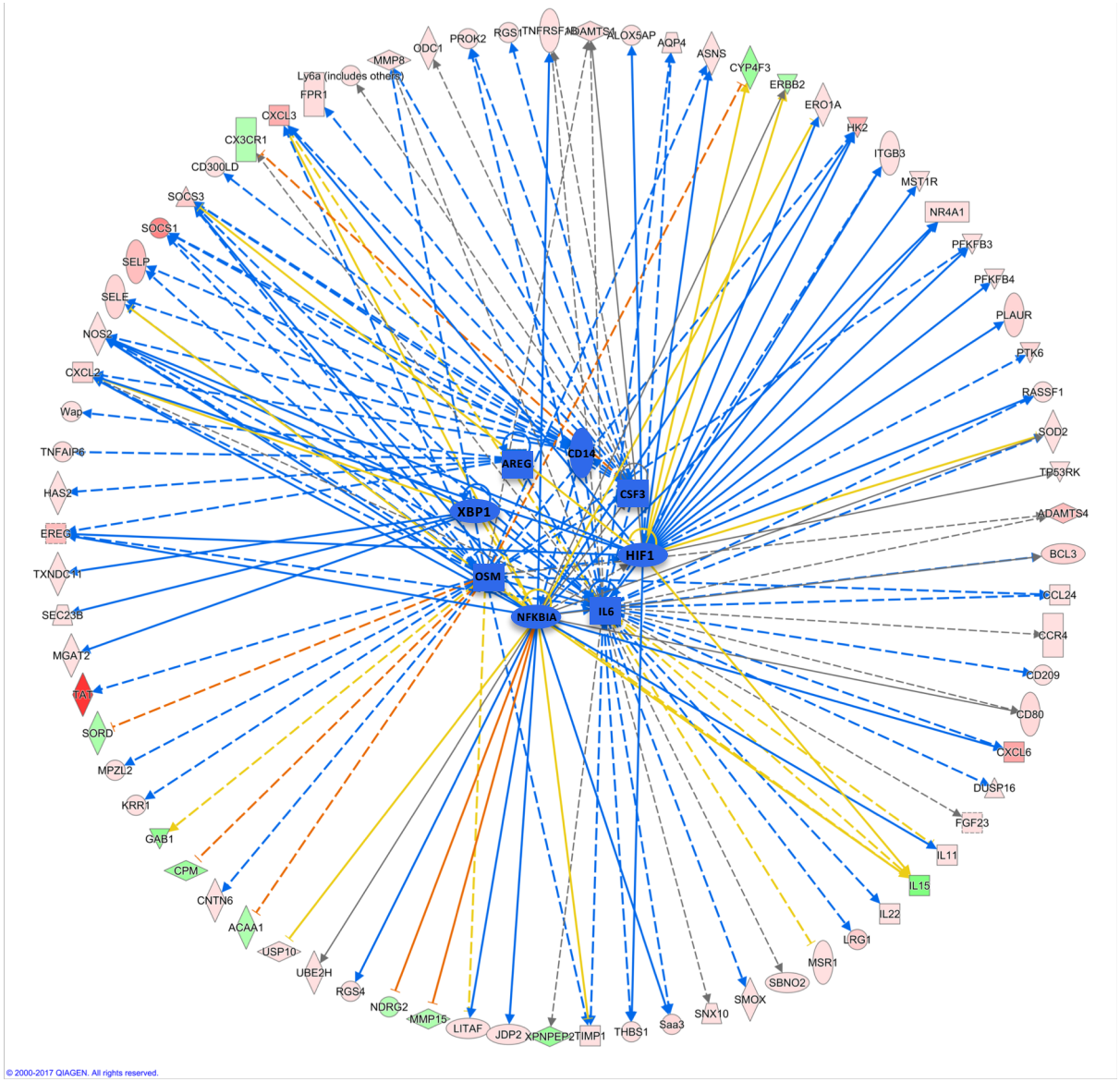
Supplemental Figure 3: SUMO1 and SUMO2/3 distribution in murine large intestine. Immunostaining of small intestinal sections from animals that were paraformaldehyde-perfused via transcardiac puncture. Sections were stained as indicated with e-cadherin (green), and either SUMO1 (red: **A,B**) or SUMO2/3 (red: **C,D**). Magnification 600x



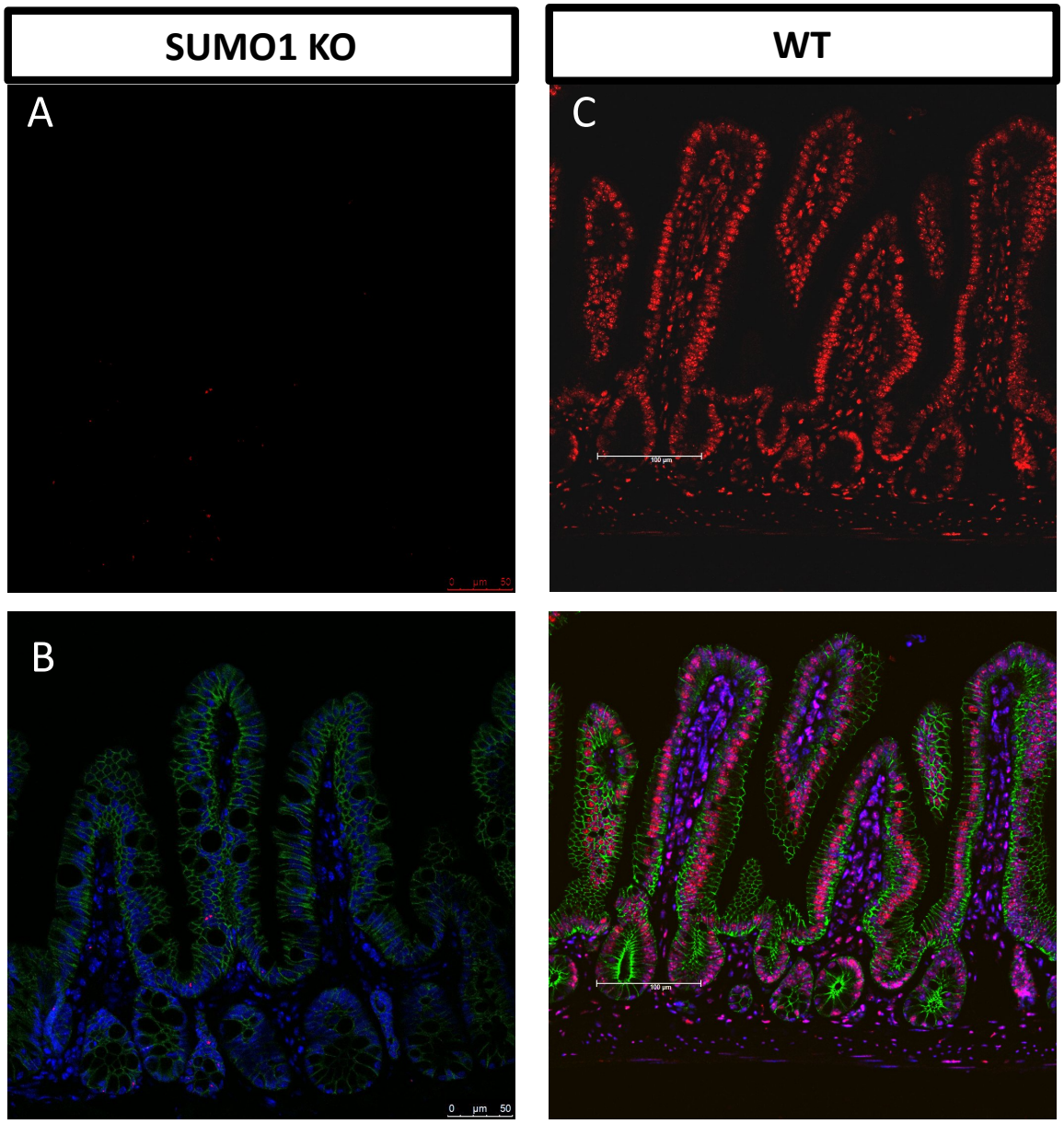
Supplemental Figure 4: Redundancy between SUMO paralogs. Immunostaining of small intestinal sections from SUMO3 (**A-D**) knock-out animals using antibodies targeted against SUMO1, SUMO 2/3 as indicated and E-cadherin (green) for anatomical orientation. Magnification 400x



Supplemental Figure 5



Supplemental Figure 6: Ubc9 overexpression reduces inflammatory gene expression during recovery from I/R injury. Candidate regulator network returned from IPA from the same dataset as in Figure 4 F and G. The outer ring includes colored-nodes (green=up-regulated, red-down-regulated) representing the genes predicted to be under the regulation of 8 regulators (blue-colored nodes).



Supplemental Figure 5: Lack of SUMO1 expression in SUMO1 knockout animals. Immunostaining of small intestinal sections from SUMO1 knock-out animals **(A,B)** using antibodies targeted against SUMO1 (red) and E-cadherin (green); DAPI (blue) is added for anatomical orientation. **(C, D)** representative images taken from WT animal. Magnification 200x.