SIGNIFICANCE STATEMENT

One potential therapeutic strategy for treating AKI, apart from supportive care, dialysis, and transplantation, is stimulating the proliferation of proximal tubular epithelial cells. The authors describe use of high-throughput screening to identify ID-8, an inhibitor of dual-specificity tyrosine-phosphorylation-regulated kinase 1A (DYRK1A), as a first-in-class compound that stimulates kidney tubular epithelial cell proliferation after different types of acute damage in two- and three-dimensional *in vitro* models. They also provide *in vitro* evidence that ID-8 is able to bind DYRK1A in primary human proximal tubular epithelial cells and stimulate proliferation after injury by upregulating cell cycle mediators. This early-stage discovery study identifies ID-8 as a potential therapeutic candidate to stimulate regeneration and repair of epithelial cells in the kidney after acute damage.