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Initiating and monitoring natural infection of mice by bioluminescent *Citrobacter rodentium*

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Abstract

Citrobacter rodentium is a Gram-negative bacterium that infects laboratory mice in a similar way to how enteropathogenic *Escherichia coli* (EPEC) and enterohaemorrhagic *E. coli* (EHEC) infect humans. We routinely use a bioluminescent derivative of *C. rodentium* called ICC180 so that we can monitor infection dynamics non-invasively using biophotonic imaging.

Experimental infection is typically initiated via oral gavage but we have previously shown that *C. rodentium* rapidly spreads between infected and uninfected animals and that bacteria shed from infected mice are 1000 times more infectious than laboratory-grown bacteria with a different tissue tropism.^{1,2}

In this collection of protocols, we describe the different methods for establishing infection by natural transmission and how to monitor infection dynamics using biophotonic imaging, viable counts, and luminometry.³

1. Wiles, S., Dougan, G., & Frankel, G. (2005). Emergence of a 'hyperinfectious' bacterial state after passage of *Citrobacter rodentium* through the host gastrointestinal tract. *Cellular microbiology*, 7(8), 1163–1172. <https://doi.org/10.1111/j.1462-5822.2005.00544.x>
2. Bishop, A. L., Wiles, S., Dougan, G., & Frankel, G. (2007). Cell attachment properties and infectivity of host-adapted and environmentally adapted *Citrobacter rodentium*. *Microbes and infection*, 9(11), 1316–1324. <https://doi.org/10.1016/j.micinf.2007.06.006>
3. Read, H. M., Mills, G., Johnson, S., Tsai, P., Dalton, J., Barquist, L., Print, C. G., Patrick, W. M., & Wiles, S. (2016). The in vitro and in vivo effects of constitutive light expression on a bioluminescent strain of the mouse enteropathogen *Citrobacter rodentium*. *PeerJ*, 4, e2130. <https://doi.org/10.7717/peerj.2130>

Troubleshooting

Files

 SEARCH

Protocol

NAME

🔗 Infection of mice with *Citrobacter rodentium* ICC180 by natural transmission

VERSION 1

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Protocol

NAME

Monitoring *Citrobacter rodentium* infection dynamics in vivo using biophotonic imaging

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Protocol

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Monitoring of *Citrobacter rodentium* shed from infected mice using luminometry and viable counts

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