Local interneurons have short axons and form circuits with nearby neurons to analyze small pieces of information.

Local interneurons control principal cells within individual brain areas, but anecdotal observations indicate that interneuronal axons sometimes extend beyond strict anatomical boundaries.

Szabo et al. used the case of the dentate gyrus (DG) to show that boundary-crossing interneurons with cell bodies in CA3 and CA1 constitute a numerically significant and diverse population that relays patterns of activity generated within the CA regions back to granule cells. These results reveal the existence of a sophisticated retrograde GABAergic circuit that fundamentally extends the canonical interneuronal network [1].

1)
Szabo GG, Du X, Oijala M, Varga C, Parent JM, Soltesz I. Extended Interneuronal Network of the Dentate Gyrus. Cell Rep. 2017 Aug 8;20(6):1262-1268. doi: 10.1016/j.celrep.2017.07.042. PubMed PMID: 28793251.