Review of: "The retinal ipRGC-preoptic circuit mediates the acute effect of light on sleep"

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The paper by Zhang et al. is a very elegant, carefully performed dissection of the light-driven neural circuit that mediates acute effects of light (i.e. increase of sleep) in the nocturnal mouse.

I have two minor comments.

1. Given that track tracing studies reported a direct innervation of VLPO by ipRGCs in the mouse (ie. Hattar et al, 2006; Delwig et al, 2016) and light induces cFos expression in a melanopsin-dependent manner in the VLPO (Lupi et al, 2008) it is somewhat surprising that no galanin-expressing neurons in the VLPO were found among the ones activated by light in the POA. The current data therefore suggest that melanopsin-dependent cFos expression takes place in non-galaninergic VLPO neurons and/or cFos expression in the VLPO is mediated by an indirect retino-VLPO pathway.
2. The Authors suspect that lack of innervation of LC by the light-responsive POA neurons might be responsible for the incapacity of ipRGC-POA circuit to influence REM sleep. While it is certainly possible, an alternative explanation is offered by the presented data. Namely, it is shown in the current study that light-responsive POA neurons innervate the LH, that is known to contain REM-active as well as the TMN and DRN that are known to contain REM-suppressive neurons (reviewed in Wang et al, 2021). Thus, simultaneous activation of these centers by the light responsive POA neurons might cancel a net effect of acute light on REM.