Selective reduction of fMRI responses to transient achromatic stimuli in the magnocellular layers of the LGN and the superficial layer of the SC of early glaucoma patients

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S1. fMRI signals in the LGN and SC of POAG and NTG patients

Figure S1 showed that there is no significant interaction between stimuli (M/P stimulus) and groups (POAG/NTG) in the fMRI response of the LGN ($F (1, 34) = 1.58$, $p > 0.2$) and the SC ($F (1, 34) = 0.37$, $p > 0.5$). The sample size for the POAG (n=10) and NTG (n=8) patients are relatively small, thus the statistic powers for the between-group comparisons might be too low to reveal any reliable differences between the two patient groups.
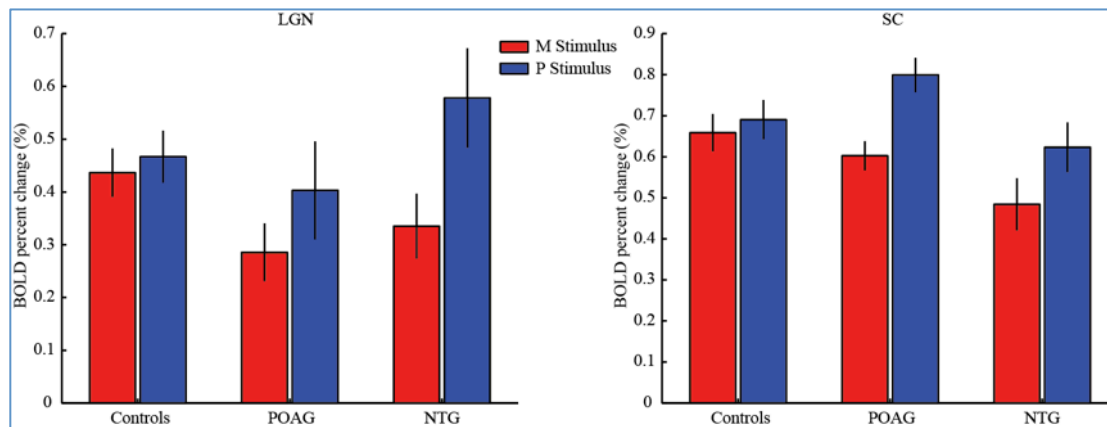

Figure S1. LGN and SC responses to the M and P stimulus in normal controls, POAG and NTG patients.

S2. Mass centers and spatial gradient of M/P beta map in the LGN

The middle and right panels of **figure S2** shows that the spatial gradients (slope) of the M and P beta values are very similar in the LGNs of glaucoma patients and normal

controls. In both groups, the posterior and superior portion of the LGN showed stronger response bias to the P stimulus (more positive P-M beta value), while the anterior and inferior portion showed stronger response bias to the M stimulus (more positive M-P beta value). Therefore, it is reasonable to use the same voxel selection criterion, which is to select voxels with the strongest response bias to the M or to the P stimulus, to identify the M and P layers of the LGN in both groups of subjects. In the left panel of **figure S2**, we plotted the mass centers of the M and P layers, and the result showed significant spatial separation between the M and P centers in both normal controls and glaucoma patients. The spatial separations of the M/P centers were comparable between patients and controls.
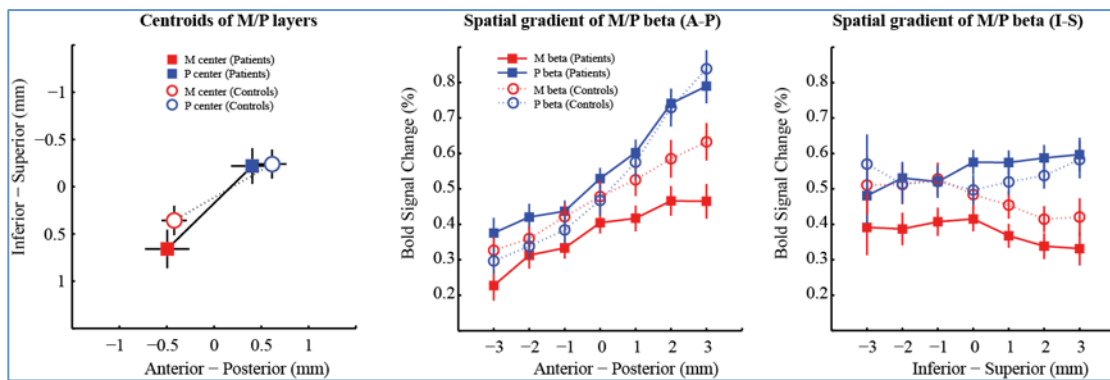
Figure S2. The left panel shows the spatial centroids of M/P layers acquired from the M-P beta map. **The middle and right panels** show the spatial gradient of M/P beta values in the A-P and I-S direction. Filled squares and solid lines represent data from glaucoma patients, while open circles with dashed lines illustrate data from normal controls.

S3. LGN M-P beta maps from group average and individuals

Figure S3 shows the averaged M-P beta map in controls and patients (upper two rows), as well as several individual maps from both groups (lower four rows). It shows that the spatial patterns of the M-P beta map were very similar across subject groups: the M biased voxels locate more inferiorly and anteriorly compared to the P biased voxels.
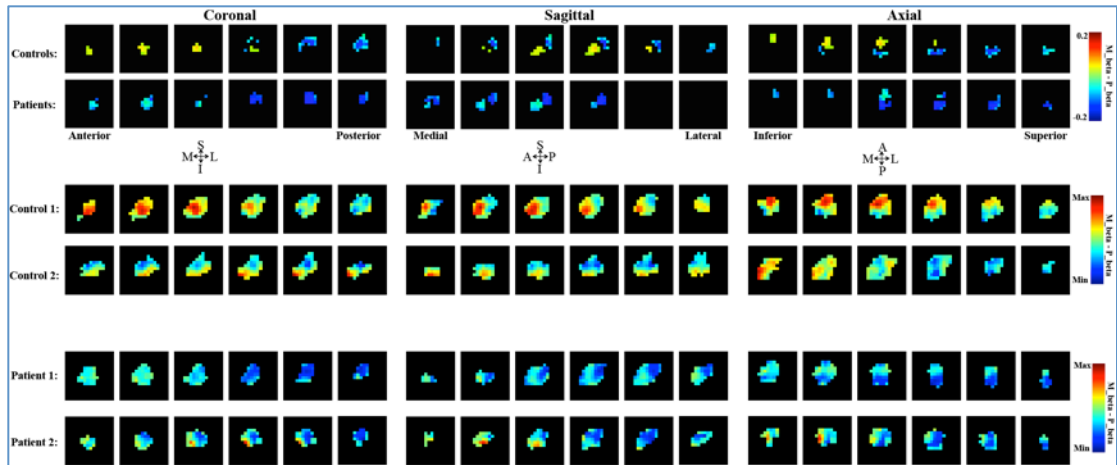
Figure S3. M-P beta maps in the LGN. The first and second rows show the average map in normal controls and glaucoma patients. Only 30 voxels with strongest bias to the M stimulus, and 30 voxels with strongest response bias to the P stimulus were shown. The 3rd to the 6th rows show the beta map of individual subjects (2 controls and 2 patients), all LGN voxels were shown for each subject. **S**: superior; **I**: inferior; **M**: medial; **L**: lateral; **A**: anterior; **P**: posterior.