論文名：Molecular genetic analysis of regulatory mechanism of root phototropism in Arabidopsis thaliana.（要約）

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（以下要約を記入する）

An asymmetric auxin distribution pattern is assumed to underlie the tropic responses of seed plants. It is unclear however whether this pattern is required for root negative phototropism. I here demonstrate that asymmetric auxin distribution is not required to establish root phototropism in Arabidopsis. My detailed analyses of auxin reporter genes indicate that auxin accumulates on the irradiated side of roots in response to an incidental gravitropic stimulus caused by phototropic bending. Further, an agravitropic mutant showed a suppression of this accumulation with an enhancement of the phototropic response. In this context, my pharmacological and genetic analyses revealed that both polar auxin transport and auxin biosynthesis are critical for the establishment of root gravitropism, but not for root phototropism, and that defects in these processes actually enhance phototropic responses in roots. The auxin response factor double mutant *arf7 arf19* and the auxin receptor mutant *tir1* showed a slight reduction in phototropic curvatures in roots, suggesting that the transcriptional regulation by some specific ARF proteins and their regulators is at least partly involved in root phototropism. However, the auxin antagonist PEO-IAA suppressed root gravitropism and enhanced root phototropism, suggesting that the TIR1/AFB auxin receptors and ARF transcriptional factors play minor roles in root phototropism. Taken together, I conclude from my current data that the phototropic response in Arabidopsis roots is induced by an unknown mechanism that does not require asymmetric auxin distribution and that the Cholodny–Went hypothesis probably does not apply to root phototropism.