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Maternal and Zygotic Expression of a *nanos*-Class Gene in the Leech *Helobdella robusta*: Primordial Germ Cells Arise from Segmental MesodermDongmin Kang^a ... David A. Weisblat^{c,1} Show more<https://doi.org/10.1006/dbio.2002.0615>[Get rights and content](#)Under an Elsevier [user license](#)[open archive](#)

Abstract

The *nanos*-class gene of the leech *Helobdella robusta* (*Hro-nos*) is present as a maternal transcript whose levels decay during cleavage; HRO-NOS protein is more abundant in the D quadrant cells relative to the A, B, and C quadrants; and HRO-NOS is more abundant in the ectodermal precursor cell (DNOPQ) than in its sister mesodermal precursor (DM) (Pilon and Weisblat, 1997). Here, using *in situ* hybridization, we show that *Hro-nos* mRNA is broadly distributed throughout the zygote, is concentrated in both animal and vegetal teloplasm during stage 1 and is at higher levels in DNOPQ than in DM at stage 4b. *Hro-nos* expression increases after stage 7, as judged by *in situ* hybridization, developmental RT-PCR, and western blots; this increase must therefore represent later zygotic expression. Of particular interest, during stages 9 and 10, each of 11 mid-body segments (M8-M18) has a pair of *Hro-nos* positive "spots" comprising of one or two large cells each. These spots later disappear in an anteroposterior progression. We find that these *Hro-nos*-expressing cells are of mesodermal origin, arising in a segmentally iterated manner from the M lineage, and correspond to cells previously proposed as primordial germ cells (PGCs; Bürger, 1891; Weisblat and Shankland, 1985). These results support the proposal that *nanos*-class genes functioned in the specification of germline cells in the ancestral bilaterian and possibly in a separate process related to embryonic polarity in the ancestral protostome.





Keywords




annelid; leech; *Helobdella*; germline; *nanos*[Recommended articles](#) [Citing articles \(47\)](#)



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