**Supplementary File 1. Cell crawling across animal diversity.**

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| --- | --- | --- | --- |
| **Phylum** | **Crawling cell types in adult organisms** | **Crawling cells during development** | **Crawling cells during wound healing** |
| **Porifera** | Archeocytes1 (absent in calcaroneans2)  Amoeboid sperm in *Leucosolenia*3 | Transiently amoeboid oocytes4,5  Ingression during larval development in some species6 | Epithelial-to-mesenchymal transition7 or epithelial migration8 of wounded pinacocytes  Crawling of mesohyl cells toward the wound8 |
| **Ctenophora** | Phagocytic stellate cells9 | Transiently amoeboid oocytes10 | Migration of mesogleal cells toward the wound11 |
| **Placozoa** | *None reported* | *Post-cleavage development unknown*  Possible oocyte formation from epithelial cells by epithelial-to-mesenchymal transition and cell migration12,13 | *Not studied at the cell level* (but a tissue-level study of healing suggests that epithelial re-sealing could occur without active changes in cell behavior14) |
| **Cnidaria** | Amoebocytes15 | Transiently amoeboid oocytes16–18  Primordial germ cell migration19  Gastrulation by ingression in some species20,21 | Epithelial cell migration22–24  Migration of mesogleal cells toward the wound25 |
| **Xenacoelomorpha** | *None reported*26 | *None reported* | Epithelial-to-mesenchymal transition of wounded epidermal cells27 |
| **Echinodermata** | Coelomocytes28 | Primordial germ cell migration29 | Mesenchymal cells migration toward site of injury30 |
| **Hemichordata** | Coelomocytes31 | *None reported* (germline development unknown) | Migration toward site of injury30,32,33 |
| **Chordata** | Amoebocytes in cephalochordates and urochordates31,34  Leukocytes and mesenchymal cells in vertebrates35 | Primordial germ cell migration36–38  Gastrulation by ingression in some species39  Neural crest cells in vertebrates | Epithelial-to-mesenchymal transition in injured epithelia40  Leukocyte migration toward site of injury41–43 |
| **Arthropoda** | Hemocytes 44 | Primordial germ cell migration 45  Gastrulation by ingression in some species46  Mesenchymal migration of mesodermal cells47,48 | Epithelial cell migration in injured epithelia 49 |
| **Tardigrada** | *None reported* (so-called brain “amoebocytes” are likely not motile50) | Primordial germ cell migration51,52  Migration of endodermal and mesodermal precursors51,52 | *Not studied* |
| **Onychophora** | Hemocytes53 | Primordial germ cell migration54  Migration of endodermal and mesodermal precursors54 | *Not studied* |
| **Nematomorpha** | *None reported* | *None reported (*embryonic development is little known) | *Not studied* |

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| --- | --- | --- | --- |
| **Phylum** | **Crawling cell types in adult organisms** | **Crawling cells during development** | **Crawling cells during wound healing** |
| **Nematoda** | Amoeboid sperm cells using a non-actin-based mechanism55 | Actin-based migration of gonad distal tip cells56  Migration of head mesodermal cells and male linker cell57 | Epithelial cell migration in embryos58 but not adults59 |
| **Priapulida** | Amoebocytes60,61 | *None reported* | *Not studied* |
| **Kinorhyncha** | Amoebocytes60,62,63 | *None reported* | *Not studied* |
| **Loricifera** | Coelomocytes64 | *None reported* | *Not studied* |
| **Annelida** | Coelomocytes65 and hemocytes44 | Primordial germ cell migration66 | Migration during regeneration67 |
| **Platyhelminthes** | *None reported* | *None reported* | Neoblasts migrate to the wounded area upon injury68 |
| **Nemertea** | Hemocytes69 | Transiently amoeboid oocytes70  Migratory proboscis precursors71 | Migration during regeneration72 |
| **Ectoprocta** | Amoebocytes73 | Primordial germ cell migration74 | *Not studied* |
| **Phoronida** | Amoebocytes75,76 | Migration of mesodermal cells77,78 | *Not studied* |
| **Brachiopoda** | Amoebocytes79,80 | *None reported* | *Not studied* |
| **Mollusca** | Hemocytes44,81 | Transiently amoeboid oocytes82–85  Presumptive germ cell migration86  Ectomesoderm migration87 | Hemocyte migration toward site of injury88 |
| **Entoprocta** | *None reported* | *None reported* | *Not studied* |
| **Gastrotricha** | *None reported* | *None reported* | *Not studied* |
| **Gnathostomulida** | *None reported* | *None reported* | *Not studied* |
| **Rotifera** | *None reported* | *None reported* | *Not studied* |
| **Micrognathozoa** | *None reported* | *None reported* | *Not studied* |
| **Chaetognatha** | Amoebocytes89 | Primordial germ cells migration90 | Epithelial cell migration91 |

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