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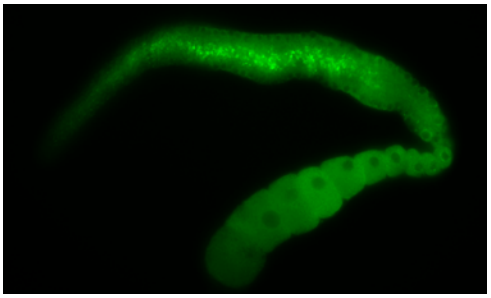
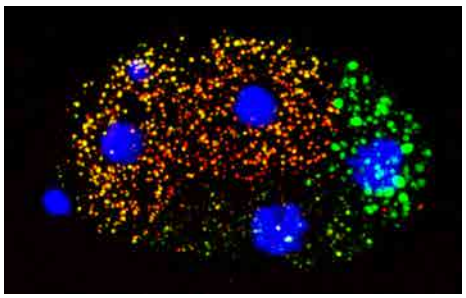
From their birth till their destruction, RNAs are always associated with proteins. Deciphering the language of how RNAs interact with specific RNA-binding proteins is a fundamentally important concept in modern molecular cell biology. Our laboratory has two main focuses. First, we are working on understanding how specific mRNAs are selected for post-transcriptional gene regulation during germ cell development. Second, we are investigating the biogenesis and function of a new family of small RNAs (22G endo-siRNAs) and how they help to maintain the genome integrity by modulation the transcriptional program of germ cells. We use a diverse set of experimental approaches, including cell biology, genetics, biochemistry and genomics to study the RNA pathways of the multicellular eukaryotic model organism *C. elegans*.

Research Projects

1. **Investigate how a conserved protein complex is required for translational repression of many mRNAs and localisation of specific RNA-binding proteins to key sites of post-transcriptional gene regulation in germ cells**
2. **Investigate the biogenesis and function the "22G" family of small RNAs during germ cell development**
3. **Investigating the role of poly(A)-tail in translational silencing (Collaboration with Dr Traude Beilharz)**



C. elegans gonad stained for a RNA-binding protein



C. elegans embryo stained for DNA (blue) and two different RNA-binding proteins (red and green)

Selected significant publications:

1. Arnold A, Rahman MM, Lee MC, Muehlhaeusser S, Katic I, Gaidatzis D, Hess D, Scheckel C, Wright JE, Stetak A, **Boag PR**, Ciosk R. 2014. Functional characterization of C. elegans Y-box-binding proteins reveals tissue-specific functions and a critical role in the formation of polysomes. *Nucleic Acids* Res, 42, 13353-69
2. Sengupta MS, Low WY, Patterson JR, Kim HM, Traven A, Beilharz TH, Colaiácovo MP, Schisa JA, **Boag PR**. 2013. ifet-1 is a broad-scale translational repressor required for normal P granule formation in C. elegans. *J Cell Sci.* 126:850-9.
3. Hammell CM, Lubin I, **Boag PR**, Blackwell TK, Ambros V. 2009 nhl-2 Modulates microRNA activity in *Caenorhabditis elegans. Cell.* 136, 926-38.
4. **Boag PR**, Atalay A, Robida S, Reinke V, Blackwell TK. 2008. Protection of specific maternal messenger RNAs by the P body protein CGH-1 (Dhh1/RCK) during *Caenorhabditis elegans* oogenesis. *J Cell Biol* 182(3):543-57
5. **Boag PR**, Nakamura A, Blackwell TK. 2005. A conserved RNA-protein complex component involved in physiological germline apoptosis regulation in *C. elegans. Development.* 132, 4975-86