

## Searches for Fish Protocols and Procedures

The tables below contain links to searches of multiple databases for alternatives and refinements for a study involving study of BMP's in Zebrafish embryonic development. Construct your own queries with appropriate terms, or use the examples below if they are relevant.

**Important!** Pubmed MeSH Terms are specific words and phrases drawn from the NLM's controlled vocabulary. Use the [MeSH Terms Browser](#) to find the MeSH Terms most appropriate for your study. Substituting phrases not found in the MeSH vocabulary will **not** be effective.

**Hot Tip!** The [MAJR] qualifier identifies a MeSH Term which is a main topic of the article. Use [MAJR] in place of [MeSH] and [ALL] to find the subset of articles focussed on the search terms. Compare the "focussed" and "inclusive" examples below to see the effect of using the [MAJR] qualifier.

### Replacement and Reduction:

The goal of these searches is to find models or systems which are more informative, to reduce animal numbers through better statistical methods, to replace species with ones more acceptable to society, and to replace animal use with in vitro or computer models, if possible.

	PubMed	Agricola	Other
<b>Model</b>	<i>focussed:</i> "Zebrafish" [MAJR] AND "Embryo" [MAJR] AND "Bone Morphogenetic Proteins"[MAJR] <i>inclusive:</i> "Zebrafish" [MeSH] AND "Embryo" [MeSH] AND "Bone Morphogenetic Proteins"[MESH]		<a href="#">MGI</a> <a href="#">BMP</a>
	"Zebrafish" [MAJR] AND "Embryo" [MAJR] AND "Neural Crest"[MESH]	w=Zebrafish & w=Embryo	<a href="#">MGI</a> <a href="#">Neural Crest</a>
<b>Alternative Animal Models</b>	("Neural Crest"[MESH] AND "Bone Morphogenetic Proteins"[MESH]) AND ("Animal Experimentation" [MeSH] OR "Models, Animal" [MeSH] OR "Models, Genetic" [MeSH])		
<b>In Vitro Assays</b>	("Neural Crest"[MESH] AND "Biological Assay" [MeSH]) NOT ("Models, Animal" [MeSH] OR "Animal Experimentation" [MeSH])		
<b>Models Not Involving Animals</b>	("Calcium Channels" [MAJR] AND ("Models, Theoretical" [MAJR] OR "Computer Simulation" [MAJR])) NOT ("Models, Animal" [MeSH] OR "Animal Experimentation" [MeSH])		
<b>Statistical Methods</b>	"Statistics" [MeSH] AND ("Animal Experimentation" [MeSH] OR "Models, Animal" [MeSH])	(w=Statistics + w=Statistical) & ((w=Sample & w=Size) + w=Power)	<a href="#">Statistics Core</a> <a href="#">Hyperstat</a> <a href="#">StatPages.net</a> <a href="#">Power</a>

			Analysis bibliography crossover designs
<b>Teaching</b>	"Teaching" [MeSH] AND ("Animal Experimentation" [MeSH] OR "Models, Animal" [MeSH])	w=teaching & w=alternatives	<b>NORINA</b>

Use the [PubMed MESH Terms Browser](#) to find terms to build your own queries.  
Use [PubMed Clinical Queries](#) for studies focussed on therapies.

### Refinement:

The goal of these searches is to find alternate procedures which cause less pain or distress.

	<b>PubMed</b>	<b>Agricola</b>	<b>Other</b>
<b>Euthanasia</b>	"Euthanasia" [MeSH] AND ("Zebrafish" [MeSH] OR "Fishes" [MeSH])	w=Euthanasia & w=Fish	Methods pdf Methods
<b>Anesthesia</b>	"Anesthesia/Methods" [MeSH] AND ("Zebrafish" [MeSH] OR "Fishes" [MeSH])	w=Anesthesia & w=Fish	<b>altweb</b> Fish
<b>Analgesia</b>	"Analgesia/methods" [MeSH] AND ("Zebrafish" [MeSH] OR "Fishes" [MeSH])	w=Analgesia & w=Fish	<b>altweb</b> Fish
<b>Surgery</b>	"Surgical Procedures, Operative/Methods"[MeSH] AND ("Zebrafish" [MeSH] OR "Fishes" [MeSH])	w=Surgery & w=Fish	
<b>ID</b>	"Animal Identification Systems" [MeSH] AND ("Zebrafish" [MeSH] OR "Fishes" [MeSH])	w=Identification & w=Fish	
<b>Substance Administration</b>	"Drug Administration Routes" [MAJR] AND ("Zebrafish" [MeSH] OR "Fishes" [MeSH])		
<b>Housing</b>	"Housing, Animal" [MeSH] AND ("Zebrafish" [MeSH] OR "Fishes" [MeSH])		<b>Enrichment DB</b>

### Why Searches For Alternatives Must Be Performed

[Mice](#) | [Rats](#) | [Dogs](#) | [Cats](#) | [Rabbits](#) | [Frogs](#) | [Ferrets](#) | [Goats](#) | [Pigs](#) | [Fish](#) | [Primates](#)