

The Zebrafish Disease Models And Chemical Screens

[#Zebrafish](#) [#Disease Models](#) [#Chemical Screens](#) [#Drug Discovery](#) [#Preclinical Research](#)

Explore the significant role of zebrafish as versatile disease models in biomedical research. Their genetic tractability and physiological similarities to humans make them ideal for studying various pathologies and conducting efficient chemical screens. This platform is crucial for drug discovery and advancing preclinical research into novel therapeutic interventions.

All materials are contributed by professionals and educators with verified credentials.

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The Zebrafish Disease Models And Chemical Screens

Trede NS (January 2012). "A model 450 million years in the making: zebrafish and vertebrate immunity". Disease Models & Mechanisms. 5 (1): 38–47. doi:10... 106 KB (11,527 words) - 10:18, 6 March 2024

have a zebrafish counterpart and even more fascinatingly 84% of disease genes in humans have a zebrafish counterpart. Most importantly perhaps is the fact... 144 KB (16,488 words) - 11:26, 8 March 2024

zebrafish organisms as they produce a large amount of synchronized, fast-to-develop and transparent eggs easy to visually score. The use of chemicals... 8 KB (928 words) - 22:13, 2 December 2023

Hence a genetic screen is a type of phenotypic screen. Genetic screens can provide important information on gene function as well as the molecular events... 18 KB (2,199 words) - 00:12, 9 January 2024

screening historically has been the basis for the discovery of new drugs. Compounds are screened in cellular or animal disease models to identify compounds that... 11 KB (1,249 words) - 19:46, 4 January 2024

including yeast, zebrafish, worms, immortalized cell lines, primary cell lines, patient-derived cell lines and whole animal models. These screens are designed... 58 KB (6,730 words) - 19:32, 16 January 2024

large-scale chemical mutagenesis screens were getting underway in several zebrafish labs at the time (those of Mark Fishman in Boston, and Christiane Nusslein-Volhard... 17 KB (1,737 words) - 00:22, 6 December 2023

chemical screens in zebrafish". ACS Chem. Biol. 5 (2): 159–61. doi:10.1021/cb100029t. PMC 4712380. PMID 20166761. Major R, Poss K (2007). "Zebrafish Heart... 43 KB (5,171 words) - 15:50, 15 January 2024

Gong Z (September 2017). "Innovative Disease Model: Zebrafish as an In Vivo Platform for Intestinal Disorder and Tumors". Biomedicines. 5 (4): 58. doi:10... 222 KB (24,530 words) - 13:08, 20 February 2024

human condition or disease, including melanoma and albinism. Recently, the gene responsible for the

melanophore-specific golden zebrafish strain, Slc24a5... 40 KB (4,507 words) - 02:39, 8 December 2023

genetic screens have now been reported in numerous publications that link gene function to cell viability, chemical and stress resistance, and other phenotypes... 19 KB (1,911 words) - 21:48, 2 December 2023

annual use of vertebrate animals—from zebrafish to non-human primates—ranges from tens to over 100 million. In the European Union, vertebrate species represent... 173 KB (19,513 words) - 11:27, 20 March 2024

whereas the t-statistic is suitable for screens with replicates. The calculation of SSMD for screens without replicates also differs from that for screens with... 33 KB (4,120 words) - 21:18, 16 February 2024

to determine the structure and/or function of genes in an organism's genome using genetic screens. The field of study is based on the merging of several... 31 KB (3,842 words) - 03:43, 23 December 2023

gallbladder and many more. The hedgehog gene (hh) was first identified in the fruit fly *Drosophila melanogaster* in the classic Heidelberg screens of Christiane... 62 KB (7,133 words) - 18:41, 9 March 2024

20 in) in length, according to the U.S. National Oceanic and Atmospheric Administration (NOAA) and the European Chemicals Agency. They cause pollution by... 171 KB (18,192 words) - 15:35, 16 March 2024

Gong Z (September 2017). "Innovative Disease Model: Zebrafish as an In Vivo Platform for Intestinal Disorder and Tumors". *Biomedicines*. 5 (4): 58. doi:10... 100 KB (11,186 words) - 19:28, 16 February 2024

on the vertebrate species studied, the documented effects of ingestion and exposure to BPA may differ. In species such as Zebrafish, BPA affects the lateral... 178 KB (20,694 words) - 16:58, 1 February 2024
Wheeler, G. N. and A. W. Brändli (2009). "Simple vertebrate models for chemical genetics and drug discovery screens: Lessons from zebrafish and *Xenopus*." *Developmental*... 14 KB (1,600 words) - 07:01, 12 December 2023

substance abuse, anxiety, aging and Parkinson disease. Potential cures can be tested against these mouse models. Gene therapy is the genetic engineering of humans... 134 KB (14,286 words) - 06:43, 7 March 2024

Immune Disease Models - Immune Disease Models CRO

Zebrafish: Modelling human disease - Sanger Institute - Zebrafish: Modelling human disease - Sanger Institute by Wellcome Sanger Institute 45,941 views 10 years ago 4 minutes, 7 seconds - Examining function of all genes in **the zebrafish**, genome to benefit human health For more see: ...

How much DNA do humans share with zebrafish?

Why do we use zebrafish in research?

Development: Automated Imaging & Analysis For Zebrafish Chemical Screens I Protocol Preview - Development: Automated Imaging & Analysis For Zebrafish Chemical Screens I Protocol Preview by JoVE (Journal of Visualized Experiments) 108 views 1 year ago 2 minutes, 1 second - Development of automated imaging and analysis for **zebrafish chemical screens**,. - a 2 minute Preview of the Experimental ...

Zebrafish 2A Model of Human Diseases - Zebrafish 2A Model of Human Diseases by King Ming Chan 315 views 4 years ago 32 minutes - This video is on the use of **zebrafish**, for the study of human **diseases**,. This is part 2 of the lectures for students studying a course of ...

Introduction

Genetics

Human Disease

Human Comparison

Genes

Testing

Cancer Research

Gene Knockdown

Leukemia

Peptic Carcinoma

Tumor

Conclusion

Large Scale Zebrafish-Based Small Molecule Screen I Protocol Preview - Large Scale Ze-

brafish-Based Small Molecule Screen | Protocol Preview by JoVE (Journal of Visualized Experiments)
58 views 1 year ago 2 minutes, 1 second - Large Scale **Zebrafish**, -Based In vivo Small Molecule **Screen**, - a 2 minute Preview of the Experimental Protocol Jijun Hao, Charles ...

Parkinson's Research Model in Zebrafish - Parkinson's Research Model in Zebrafish by Pentagrit
Zebrafish Discovery 476 views 4 years ago 9 minutes, 49 seconds - Different experimental setups are used to validate the prognosis of Parkinson's **disease**, in response to the behavioral changes in ...

Introduction

Path

Trauma

Muscular rigidity

Behavioural passes

Time test

Brain cytologists

Postural instability

Stereotypical movement

Movement

Conclusion

Zebrafish models of ALS - Zebrafish models of ALS by ALSCanada 616 views 5 years ago 24 minutes
- Using **zebrafish**, and cutting edge technology to create a better way of studying ALS in animals.

This is an archived presentation ...

Introduction

Zebrafish

Background

Why Zebrafish

Lab Studies

Descending Input

Genes

Mutations

A380

Spinal cord

Transgenic vs CRISPR

Question

Breeding Zebra Danios - Breeding Zebra Danios by Akvaristika Beke 459,636 views 4 years ago 2 minutes, 42 seconds - 1- Place a coarse plastic mesh inside the breeding tank and the water level in the tank is adjusted so that **the fish**, have about 5 ...

The Tiny Fish That's Changing Modern Medicine - The Tiny Fish That's Changing Modern Medicine by SciShow 303,107 views 7 years ago 4 minutes, 33 seconds - The little **fish**, Danio rerio holds secrets to understanding how vertebrates develop, how **diseases**, like cancer work, and how we ...

Intro

Why Fish

ProHema

Baby Zebrafish Eyes Work Kind of like Real-Time Photoshop - Baby Zebrafish Eyes Work Kind of like Real-Time Photoshop by SciShow 197,385 views 5 years ago 5 minutes, 22 seconds - Some **fish**, have superpowers! **Zebrafish**, eyes can boost the color and contrast of what they see and baby whale **fish**, are electric.

HUNT, & AVOID GETTING EATEN

BABY WHALE FISH Brienomyrus brachyistius

Current Biology

Understanding CRISPR-Cas9 - Understanding CRISPR-Cas9 by Andrew Douch 137,977 views 2 years ago 35 minutes - This video is a deep-dive into CRISPR-Cas9, but it takes the time to explain terms and concepts carefully, so that students who are ...

Introduction

How CRISPRCas9 works

Cas9 Enzyme

Guide RNA

SG RNA

Adaptive immune response

CRISPRCas9 editing

Nonhomologous end joining

Homologous directed repair

Resection to a chi site

Inserting a foreign gene

Double strand break repair

Why doesnt CRISPRCas9 cut the bacterias own DNA

Breeding Zebrafish - Breeding Zebrafish by Understanding Animal Research 127,530 views 9 years ago 4 minutes, 13 seconds - This film shows some of the aspects of **zebrafish**, production and maintenance. **Zebrafish**, embryos, unlike mouse embryos, ...

Zebrafish (Danio rerio) are bred in large numbers for medical and scientific research

Zebrafish have 12,719 genes in common with humans - about 70% of the total

While 70% of human genes are found in zebrafish these include 84% of human disease-causing genes

Here zebrafish are stimulated by a mesh to breed and and lay eggs

The fish eggs are collected and given to researchers within one hour of fertilisation

These fish are adults, they reach adulthood and can breed in 3-4 months

Sometimes these strains are different colours to the wildtype

Young fish are fed rotifers (invertebrate), these feed on algae, giving the greenish tinge

Adult fish are fed brine-shrimp grown within the facility

Fish tank water is filtered

Zebrafish as a model organism for genetic diseases - Zebrafish as a model organism for genetic diseases by Greenwood Genetic Center 14,897 views 4 years ago 26 minutes - GGC Director of Functional Studies, Dr. Heather Flanagan-Steet, provides an overview of the use of **zebrafish**, as a model ...

Variants of Uncertain Significance

Life Support Room

The Life Support Room

The Preparation Room

Brine Shrimp

The Housing Room

Nursery

How Do We Tell a Male from a Female

Chamber System

Do the Animals Lay Eggs all Day Long

Change Gene Expression

Confocal Microscope

Looking for Answers in the Skull of a Zebrafish - Looking for Answers in the Skull of a Zebrafish by Journey to the Microcosmos 201,587 views 2 years ago 9 minutes, 44 seconds - If you want to learn more about the imaging technology that helps to create amazing microscopy like you saw in this video, head to ...

Intro

The Competition

The Winner

The Zebrafish

Outro

Drawn to Science: Zebrafish - a new model for drug discovery - Drawn to Science: Zebrafish - a new model for drug discovery by Roche 55,485 views 10 years ago 3 minutes, 32 seconds - Zebrafish, larvae have evolved into a very attractive model for drug discovery. Recently published methods facilitate genetical ...

Introduction

Zebrafish

The interest of scientists

Zebrafish Heart Regeneration | HHMI BioInteractive video - Zebrafish Heart Regeneration | HHMI BioInteractive video by biointeractive 26,658 views 6 years ago 2 minutes, 31 seconds - The zebrafish, heart is similar to the human heart in many respects. But unlike the human heart, **the fish**, heart closes wounds ...

Do zebrafish have lungs?

Zebrafish Development - Zebrafish Development by NICHDVideos 124,903 views 6 years ago 2 minutes - Researchers who study human development rely on animal **models**., such as **zebrafish**.,

to gain insight into growth and movement.

Zebrafish screens for new melanoma targets - Zebrafish screens for new melanoma targets by AlphaMed Press 31 views 9 years ago 33 minutes - Zebrafish screens, for new melanoma targets.

Intro

Background

Zebrafish model

High penetrance model

Genetic modifiers

Levi Garraway

Mini cooper

Transgenic animals

Human tissues

Expression profiling

Zebrafish embryos

Does the small molecule affect marker genes

The Travelling Ratio

Metagene Plot

Results

Clinical trials

Conclusion

Questions

Zebrafish as An Animal Model for Balance and Hearing Deficits - Zebrafish as An Animal Model for Balance and Hearing Deficits by Stanford Otolaryngology — Head & Neck Surgery 176 views 2 years ago 53 minutes - This Grand Round took place December 12, 2019.

Objectives

Basics about Zebrafish

Zebrafish

Reasons for Choosing Zebra Fish

Why Choose Zebrafish

Basic Anatomy

Frequency Range

Why Does the Fish Need To Hear

Ease of the Genetic Methods

Morphogenesis

Basic Animal Husbandry

Genetic Tools

Chemical Immunogenesis

Morpholinos

Mutagenesis

Examples of Promoters That Are Widely Used in Zebrafish

Disease Models

General Areas of Studying

Melanoma Model

Toxicology

Lateral Line Organ

Using the Fish as a Model for Research

Acoustic Function

Vestibular Ocular Reflex

Vestibular Spinal Reflex

Morphological Defects

Hair Cells

Hair Cell in the Inner Ear

Advantages to Zebrafish

Brain-Wide Imaging

5.3 How to model an infection in Zebrafish - 5.3 How to model an infection in Zebrafish by EU project ImageInLife 227 views 3 years ago 9 minutes, 26 seconds - Modelling, is a new and important tool in understanding pathogens interaction with the host and identify new variables. In this ...

Mathematical Modeling of Infection

Big Data Modeling

Basic Model of Viral Application

Zebrafish screens for new melanoma targets - Zebrafish screens for new melanoma targets by The Society for Translational Oncology 156 views 11 years ago 33 minutes - Genetic and **chemical screens**, identified two potential new targets in melanoma - SETDB1, DHODH ...

Zebrafish as a Model for Human Cancer by Leonard Zon, MD - Zebrafish as a Model for Human Cancer by Leonard Zon, MD by The Society for Translational Oncology 6,135 views 13 years ago 30 minutes - Lecture by Leonard Zon, MD **Zebrafish**, tumors have relatively similar pathophysiology as human cancers, and are amenable to ...

Intro

Learning objective

Dusp6 is a transcriptional target and negative regulator of RAS/MAPK pathway

Eighteen chemicals were confirmed to be suppressors of RAS signaling

Identify chemical suppressors that impede zebrafish tumor progression

Preclinical study: a randomized cohort trials

Transcriptional profiling of embryos as a window into tumor initiating events

Zebrafish melanoma and the neural crest

BRAF;p53 prevents terminal differentiation of NC progenitors

Human melanoma is "neural crest" like, too

Inhibitors of DHODH abrogate crestin cells

The cad-dhodh pathway

cad-dhodh mutants and neural crest defects

UTP and transcriptional elongation

Does DHODH inhibition block transcriptional elongation?

Metagene analysis: genes that pause

Genes paused by leflunomide: IPA

myc, elongation and melanoma

How the Zebrafish Could Help Us Treat Eye Disease or Injury (audio-described version) - How the

Zebrafish Could Help Us Treat Eye Disease or Injury (audio-described version) by National Eye Institute, NIH 3,579 views 3 years ago 41 seconds - Did you know that some animals can regrow parts of their eyes? What if we could do the same? NEI-funded scientists are studying ...

can regrow parts of their eyes?

Zebrafish can repair their optic nerve

for people with eye diseases or injuries.

Joanna Yeh: CRISPR Applications - Zebrafish - Joanna Yeh: CRISPR Applications - Zebrafish by Innovative Genomics Institute – IGI 1,539 views 6 years ago 52 minutes - Joanna Yeh (Harvard University) explains the development and applications of CRISPR genome engineering in **zebrafish**,.

Intro

Zebrafish is an attractive model for drug discovery

The Zebrafish Genome

Advantages of the zebrafish model

Zebrafish phenotype-based drug discovery

Disease Modeling & Chemical Genetics Approach

Complete loss of the wild-type allele in CRISPR-injected fish

5' GG mismatch can be tolerated

Approaches for creating designer modifications

DNA repair mechanisms

Conditional CRISPR knockouts

The Druggable Genome

Target Development Level, NIH

Zebrafish Behavioral Phenotyping

Manual Small Molecule Screen Approaching High-Throughput Using Zebrafish Embryos I Protocol

Preview - Manual Small Molecule Screen Approaching High-Throughput Using Zebrafish Embryos

I Protocol Preview by JoVE (Journal of Visualized Experiments) 55 views 1 year ago 2 minutes, 1

second - A Manual Small Molecule **Screen**, Approaching High-throughput Using **Zebrafish**, Embryos - a 2 minute Preview of the ...

How to make models in Zebrafish for various diseases. - How to make models in Zebrafish for various diseases. by Research Boulevard Technologies 202 views 1 year ago 10 minutes, 50 seconds - How to make **models**, in **Zebrafish**, for various **diseases**,.

Pathogenesis

Knockout Models

How To Make Models in Zebrafish

Oral Method

The Oral Cavity System

Intramuscular Injection

Interperatorial Injections

Chemical Screening Procedure: Glucocorticoid Signaling (Zebrafish Larva Luciferase Reporter System) - Chemical Screening Procedure: Glucocorticoid Signaling (Zebrafish Larva Luciferase Reporter System) by JoVE (Journal of Visualized Experiments) 118 views 1 year ago 2 minutes, 1 second - A **Chemical**, Screening Procedure for Glucocorticoid Signaling with **a Zebrafish**, Larva Luciferase Reporter System - a 2 minute ...

Zebrafish as a Model for Human Cancer - Zebrafish as a Model for Human Cancer by AlphaMed Press 109 views 9 years ago 30 minutes - Zebrafish, as a Model for Human Cancer.

Introduction

Zebrafish Genetics

Rast Problem

Heat Shock

Dust

Screen

Daves model

Jun Ying Lee

Biochemistry

CRISPR-Cas9 Genome Editing Technology - CRISPR-Cas9 Genome Editing Technology by Professor Dave Explains 556,468 views 2 years ago 14 minutes, 27 seconds - We've learned about a few techniques in biotechnology already, but the CRISPR-Cas9 system is one of the most exciting ones.

Zebrafish Genetics Lab | Lab Facilities | Dr. S. Kirankumar, Ph.D | SRM Genetic Engineering - Zebrafish Genetics Lab | Lab Facilities | Dr. S. Kirankumar, Ph.D | SRM Genetic Engineering by SRM Genetic Engineering 1,568 views 1 year ago 9 minutes, 36 seconds - Zebrafish, Genetics Lab | Molecular Genetics Lab | Lab Facilities | Dr. S. Kirankumar, Ph.D | SRM Genetic Engineering **Zebrafish**, ...

Intro

DR S KIRANKUMAR ASSOCIATE PROFESSOR

ZEBRAFISH AQUARIUM FACILITYI ZEBRARISH GENETICS LABORATORY

ZEBRAFISH AQUARIUM FACILITY II ZEBRAFISH GENETICS LABORATORY

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MR VELANGANNI SELVARAJ SENIOR RESEARCH FELLOW

MR ANANTHAKRISHNA TANTRY MS JUNIOR RESEARCH FELLOW

MR RAGHUNATH M

Fishing for answers to hemostatic and thrombotic disease: Genome editing in zebrafish - Fishing for answers to hemostatic and thrombotic disease: Genome editing in zebrafish by National Bleeding Disorders Foundation 52 views Streamed 1 year ago 53 minutes - Fishing for answers to hemostatic and thrombotic **disease**;: Genome editing in **zebrafish**, Speaker(s): Dr. Jordan Shavit NHF's ...

Introduction

What is DNA

Y chromosome

Genetic diseases

Large pedigrees

Gene knockouts

Gene therapy for inherited disorders

What is genome editing

Zinc finger genome editing

Double strand break cuts

Mayo Clinic video

Science is a team sport

Clinical therapeutic immunity

Crispr

Kathy High
AAV
Genome editing in animals
Knockout
Genome editing
Coagulation
Multiwell plates
Imaging of blood clots
New activators of clotting
Survival
Histology
Fish vs mice
Partnering with biobanks
Algorithms
Lines of evidence
Coagulation factors
Summary
Conclusion
Awards of Excellence
Judith Graham Pool postdoctoral fellowship
Judith Graham Pool clinical fellowship
The biggest challenge
The biggest takeaway
Importance of basic science
Gene therapy in Africa
Biobanks in Africa
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