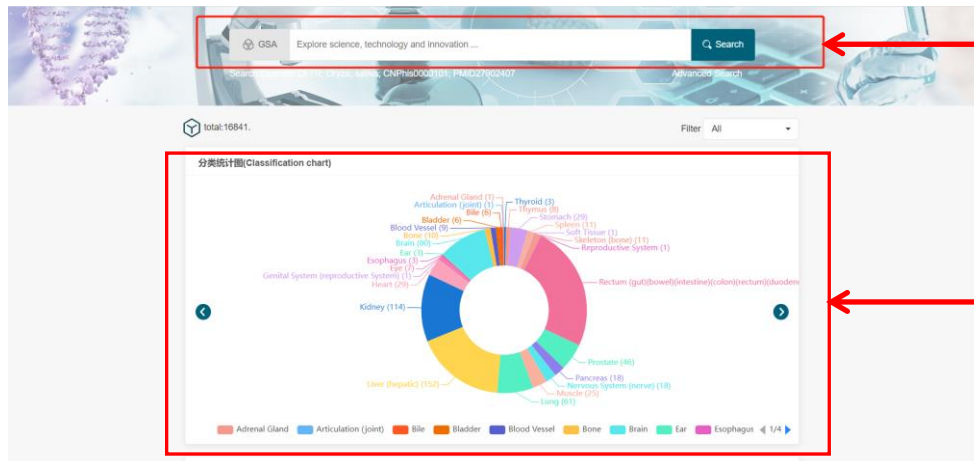


Help document

1. Popular resources

1.1. GSA Database

A total of 16,841 cases of microarray and transcriptome sequencing raw data were collected in the GSA database. These data are categorized on the basis of human organs and tissue types, including the lung, muscle, skeleton, nervous system, genetic system, soft tissue, etc. The exact number of microarray and transcriptomic sequencing can be found on the database website. In addition, publication years of organs-on-a-chip-related literature are tracked. Moreover, the statistical results showed that in recent years, the research data on organs-on-a-chip are increasing, and organs-on-a-chip is gradually becoming a trending research area.



Click here to search for histological data

View the Classification chart here

GSA

GSE80264
Status: Public on May 05, 2016
Title: Transcriptome analysis of H9 hESC derived cerebral organoids
Organism: [Homo sapiens](#)
Experiment Type: Expression profiling by high throughput sequencing
Summary: RNA-seq was utilized to characterize the transcriptome of human embryonic stem cells-derived 3D cerebral organoids. Briefly, H9 hESCs were differentiated into cerebral organoids using previously established methods (Lancaster, 2013). Coding and noncoding genes were analyzed in 1 month and 2 month old cerebral organoid samples.
Overall Design: Examination of transcriptome of hESC and cerebral organoids 1 month and 2 months old with 2 experimental replicates per group.
Organization Name: University of California, San Diego
Department: Pediatrics

GSE86153
Status: Public on Apr 27, 2017
Title: Identification of extensive cellular diversity and maturation of active neuronal networks in long-term cultures of human brain organoids
Organism: [Homo sapiens](#)
Experiment Type: Expression profiling by high throughput sequencing
Summary: We analyzed gene expression in over 80,000 individual cells isolated from 31 human whole-brain organoids that has developed for 3-6 months. We find that organoids can generate a broad diversity of cells, which we show are related to known endogenous classes, including subpopulations of neurons and progenitors of the cerebral cortex.
Overall Design: Single cell Droplet sequencing of human cerebral organoid.
Organization Name: Harvard University
Department: Stem Cell & Regenerative Biology

GSE90053
Status: Public on Feb 10, 2017

Click here to view the histological data

Department	Pediatrics	
Street address	9500 Gilman Dr.	
City	La Jolla	
State/province	CA	
ZIP/Postal code	92093	
Country	USA	
Platforms(1)	GPL18573	Illumina NextSeq 500 (Homo sapiens)
Samples(6) More...	GSM2123101 GSM2123102 GSM2123103	H9 hESC 1 H9 hESC 2 1 month organoid 1
Relations	BioProject SRA	PRJNA318446 SRP073286
Download family	Format	
SOFT formatted family file(s)	SOFT formatted family file(s)	
MINIML formatted family file(s)	MINIML formatted family file(s)	
Series Matrix File(s)	Series Matrix File(s)	

Click here to download the histological data

1.2. DrugBank Database

The DrugBank database contains information on 14,020 types of drugs associated with organs-on-a-chip. The database provides the drug information such as name, accession number, structure, chemical formula, synonyms, Unique Ingredient Identifier (UNII), International Chemical Identifier (InChi), InChi key, Simplified Molecular Input Line Entry System (SMILES), weight, drug entry, and other drug information which helps users to find drug-related information.

OOODB - Organ on a Chip Database

Search: 药物 Explore science, technology and Innovation ... Search

Search keywords: TCPS; Organs; cells; CNPhis0000101; PMID27902407

total: 14020. 筛选: ABC DEF GHI JKL MNO PQR STU VWX YZ#

Drug

Arginine

Accession Number: DB00125 (NUTR00014)

Type: Small Molecule

Groups: Investigational, Nutraceutical

CAS number: 74-79-3

Chemical formula: $C_6H_{14}N_4O_2$

Weight: Average: 174.201
Monoisotopic: 174.111675712

Description: An essential amino acid that is physiologically active in the L-form.

Click here to search for drug data

Click here to view the Drug-related literature

Click here to view the drug data

1.3. Device Database

In the device database, we first presented the distribution map of 160 studies on organs-on-a-chip devices. Users can click desired organs-on-a-chip devices in the distribution map to retrieve the relevant studies in the literature database. The database contains a brief introduction of organs-on-a-chip devices, including fabrication materials, production technology, fluid drive and control in microfluidic chip, and signal detection.

Classification chart

TCPS(1) Floating(2) Macromer(2) Microfabrication(18) 3d print(1) Membrane(TCPS)(PC)(PTFE)(60) Hydrogel(2) PDMS(Polydimethylsiloxane)(52)

Organs-on-chips device

The core of organ chip device-microfluidic chip

Microfluidic chip is the core of organs-on-chips laboratory. The research of organs-on-chips involves chip material, size, design, processing and surface modification. A microfluidic chip is a technology characterized by manipulating fluids in a micrometer-scale space. It has the ability to shrink the basic functions of chemistry and biological laboratories onto a chip a few square centimeters in size. Understanding the entire process of chip preparation and understanding the importance of chip design is the basis of organs-on-chips research. The keypoint in the field of organs-on-chips real face room is the technology of chip design and manufacturing first.

Commonly used microfluidic chip materials and properties

1) Requirements for the selection of microfluidic chip materials:

a. Good chemical and biocompatibility;

b. Good electrical insulation and heat release;

c. Good material performance;

Jump device list

Click to jump

Vascular organ chip device

Brain tumor organ chip device

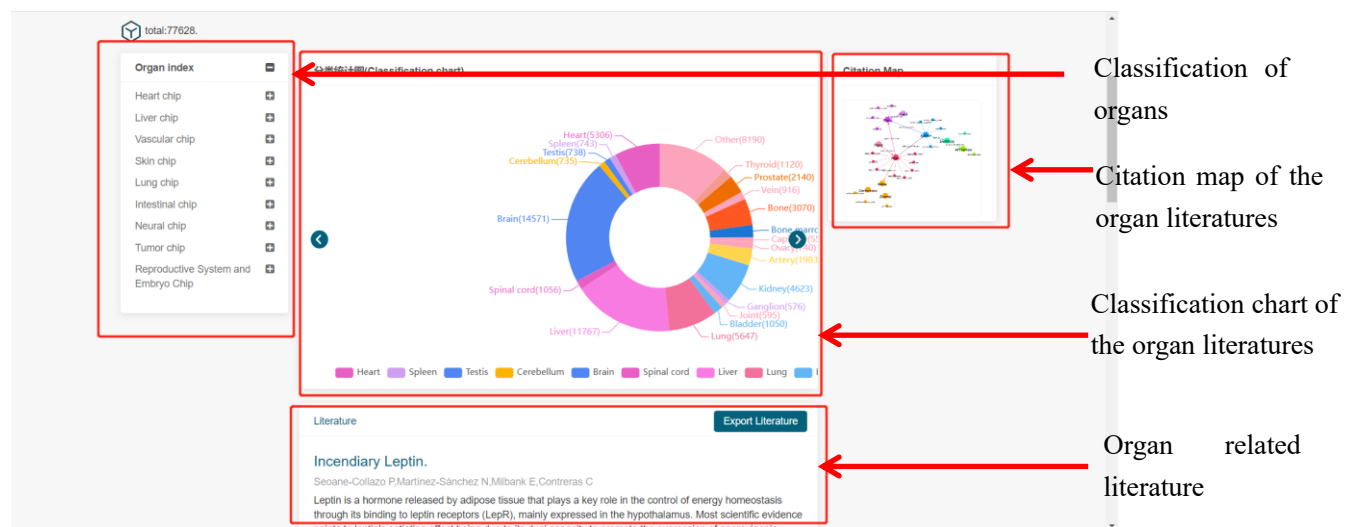
Click here to view the device data

Brief introduction of the organs-on-a-chip device

1.4. Organ Database

In the organs database, studies are classified on the basis of organ names, resulting in

97 different categories and each category corresponding to an organ. Comparing these category keywords with the organs-on-a-chip literature that we downloaded, a total of 77,628 relevant documents were screened and then classified. Subsequently, the top 20 organs were selected with the highest frequency for a graphic display. In the organ database, the most studies on organ microarray were about the brain (15,974), liver (11,844), and lung (5758), which is also the research hotspot of organ microarray. OOCDB provides full-text downloads of these related studies and maps of references and citations. The reference and citation are drawn into a citation map, and the size of the circle indicates the author's influence in this field. The larger circle indicates the greater influence of authors, which is convenient for researchers to find experts in the field.



1.5. Patent Database

The patent database is developed by screening out 54 keywords associated with organs-on-a-chip, searching on google patents, and retrieving a total of 11,915 patents. These patents are downloaded to our database and classified according to different countries. In addition, OOCDB provides full-text retrieval and allows downloading of relevant patents. Users can narrow the search scope according to date and country in the OOCDB and also retrieve in the advanced search according to title, author, abstracts, description, patent number, and country expiry date of the patent. Therefore, the users

can easily download the patents they need.

The screenshot shows a patent search interface with three main sections:

- Number of patents by country / institution:** A pie chart showing the distribution of patents across various countries and institutions. The United States is the largest contributor, followed by China, Japan, and the European Patent Office.
- Search filters:** Fields for 'Expire date' (2022-08-24 to 2042-08-19) and a 'keyword' field with a 'Search' button.
- Patent result:** A list of search results, with the top result being '접속 자극 발생 구조의 마우스' (Organ-on-a-chip related patent) with application number KR20200032076A.

1.6. Cancer Research Database

The cancer research database is similar to the organs database. Using 87 cancer keywords, 30,158 articles were found, and the top 20 cancers frequently mentioned in papers were presented in a chart. In the cancer database, breast cancer (3189), leukemia (2386), and lung cancer (1701) are mentioned in high frequency, and organs-on-a-chip are widely used in these cancers. Similar to the organs database, this database also contains a citation map to find out the authoritative scholars in the field of organs-on-a-chip and cancer.

The screenshot shows a cancer research database interface with three main sections:

- Organ Index:** A list of organ types including Heart chip, Liver chip, Vascular chip, Skin chip, Lung chip, Intestinal chip, Neural chip, Tumor chip, Reproductive System and Embryo Chip.
- Classification chart (Classification chart):** A donut chart showing the frequency of 20 different cancer types. The most frequent are Squamous cell carcinoma (717), Leukemia (2352), Lung cancer (1624), Colorectal cancer (999), Multiple myeloma (325), Mesothelioma (240), Breast cancer (3121), Neuroblastoma (785), and Lymphoma (1150).
- Citation Map:** A network diagram showing relationships between authors and their publications.
- Literature:** A list of search results, with the top result being 'Integrative comparison of the genomic and transcriptomic landscape between prostate cancer patients of...' by Yuan J, Kensler KH, Hu Z, Zhang Y, Zhang T, Jiang J, Xu M, Pan Y, Long M, Montone KT, Tanyi JL, Fan Y, Zhang R, Hu X, Reibbeck TR, Zhang L.

1.7. Chemical Database

The chemicals database stores the information of 4,986,258 compounds associated with organ microarrays. The compounds are ordered by name. The compounds database provided information, including InChi key, SMILES, and InChi. It is convenient for users to find the structures and properties of related compounds.

total: 4986258 .

SCHEMBL20775451
InChi_key: MIUMHOREVPONDJPUSWNVQFSA-N
SMILES: COC1=CC2=C(C(COC)=C1OC)C1=CC=C(OC)C(=O)C=C1C@H](CC2)NC(C)=O.CC[C@@H]([C@@H](C)O)N1N=CN(C1=O)C1=CC=C(C=C1)N1CCN(CC1)C1=CC=C(OC[C@@H]2CC[C@@H](CN3C=NC=N3)(C2)C2=C(F)C=C(F)C=C2)C=C1
Inchi: InChi=1S/C37H42F2N8O4.C22H25NO6/c1-3-35(26)(248)47-36(49)46(25-42-47)31-7-5-29(6-8-31)43-14-16-44(17-15-43)30-9-11-32(12-10-30)50-20-27-19-37(51-21-27-22-45-24-40-23-41-45)33-13-4-28(38)18-34(33)39-1-12(24)23-16-8-6-13-10-19(27-3)21(28-4)22(29-5)20(13)14-7-9-18(26-2)17(25)11-15(14)16h4-13,18,23-27,35,48h,3,14-17,19-22h2,1-2h3;7,9-11,16h,6,8h2,1-5h3,(H,23,24)126-27+,35-,37-,16-m00s1

SCHEMBL20775452
InChi_key: NGDZVFSMBNYTF-UHFFFAOYSA-N
SMILES: CN(C)CC1=CN=CC(=C1)C1=NC2=C(NN=C2C2=CC3=C(N2)C=CC=C3C2=CC=C(F)S2)C=C1
Inchi: InChi=1S/C26H21FN6S/c1-33(2)14-15-10-16(13-28-12-15)19-6-7-21-25(30-19)26(32-31-21)22-11-18-17(4-3-5-20)18)29-22(23-8-9-24)27)34-23h3-13,29h,14h2,1-2h3,(H,31,32)

Chemical-related data

1.8. Toxicant Database

The toxicants database contains information about 17,329 types of toxicants. They are arranged in alphabetical order and can be retrieved according to the order of the alphabet. Moreover, users can directly import the name of the toxicants in the search box and jump to the toxicants interface. In the toxicants detailed interface, information on various toxicants, including name, equivalent terms, other database numbers, CAS registry number, structure image, and external links, is provided. If some properties of toxicants cannot be found in OOCDB, users can also click on external links to enter the special toxicants database for a query. At the same time, we also combined the toxicants database with the organs-on-a-chip literature database. If the toxicant is applied to organs-on-a-chip-related research, the corresponding literature is provided below.

OOODB - Organ on a Chip Database

Southeast University
Organ on a Chip Database

Home Database Submission About Help Lab data

Search: Explore science, technology and innovation ...

Search External: CSTR; Oryza; etdha; CNPhis0000101; PMID27802407

total: 17329.

筛选: ABC DEF GHI JKL MNO PQR STU VWX YZ#

guanadrel
ExternalLinksText: ChEBI 40580-59-4 ChemDplus © 40580-59-4 PubChem C004945
Mesh ID: C004945

cevimeline
ExternalLinksText: ChEBI 107233-08-9 ChemDplus © 107233-08-9 PubChem C059240
Mesh ID: C059240

Crn 40580-59-4
DetailUrl http://cddbse.org/detail.go?type=chem&acc=C004945
Img

Literature [Export Literature](#)

Comparison of guanadrel and guanethidine efficacy and side effects.
Mallinow SH
Eighteen patients with essential hypertension uncontrolled by hydrochlorothiazide alone were randomly assigned to receive additional therapy with either guanadrel sulfate or guanethidine sulfate. The frequencies of morning orthostatic faintness, other orthostatic faintness, and diarrhea were twice as high in eight patients treated with guanethidine as in ten patients treated with guanadrel in a six-month comparison. The two drugs reduced blood pressure about equally well. In light of the efficacy without severe side effects, guanadrel may be an agent for step II therapy of hypertension.
PMID:6850722 Time:1983-01-01

上一页 1 下一页 跳至 1 页 确定

Toxicants data screening

Click to see details of the toxicants

Toxicants related literatures

2. Featured tools

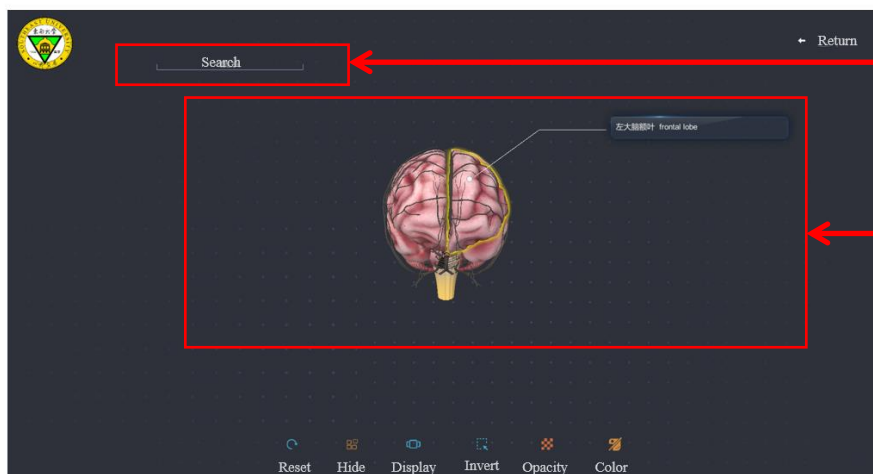
2.1. Three-dimensional model

A 3D model is a tool used to understand the combination of organs-on-a-chip data in OOCDB and human organs at the level of human anatomy. Users can navigate and find the target organ by navigating in 3D anatomical atlas for the human brain male and female bodies. A visual window shows the real human anatomical structures. This includes three parts: human brain model, male anatomical model, and female anatomical model. Figure shows that the database provides high-quality human brain model, male anatomical model, and female anatomical model, including internal structures using a surgical view. Users can click the image to enter the corresponding

model and then click it to enter the corresponding organs. On clicking the corresponding position of the organ in the model, users can get the corresponding organ name, and then by clicking the name of the organ, users can view omics data, literature data, and drug data of the organ in OOCDB to find the detailed information on the organs-on-a-chip and the current research status.

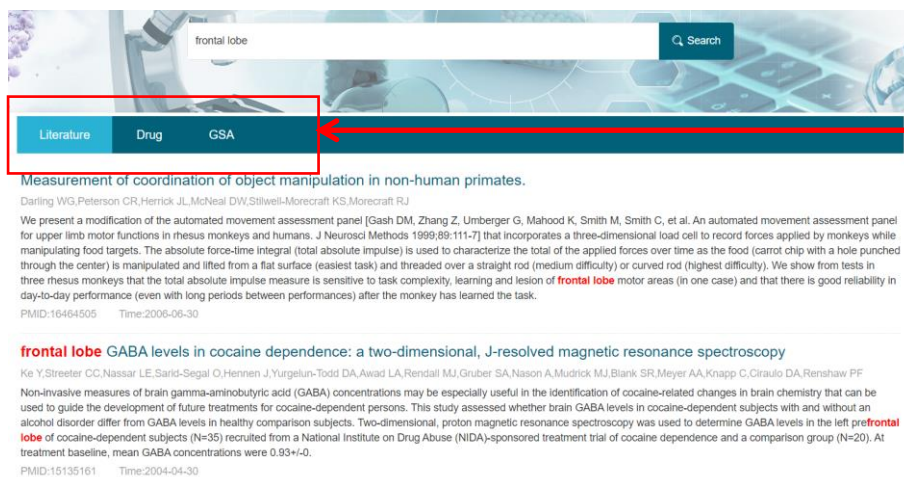


Click here to select a 3D model



Click here to search for related organs

Click here to search for organs



Click here to switch search results

2.2. Mathematical Model

we provided a mathematical modeling section that provides users with a useful tool to estimate consistency between in vitro data based on their organs-on-a-chip platform and the gene expression data from real human organs. This section currently provides a tissue-specific enrichment approach named TissueEnrich, a tool to calculate the enrichment of tissue-specific genes in a set of input genes with the hypergeometric test. For the input step, user uploads the gene list of the most highly expressed genes, differentially expressed genes, or co-expressed genes to the web server. The gene list can be typed directly or selected as a file in the web page of the tool. In addition, the user can provide an expression dataset of interest for further tissue-specific enrichment analysis in the next step. The results will be tables and plots. The tables are the scores of the enrichment analysis, such as the $\log_{10}(\text{P-value})$, tissue-specific gene number, fold change, samples, and tissue type, and the genes that are enriched. The plots are the bar plot of the $\log_{10}(\text{P-value})$ and the heat map of the expression profile of the tissue-specific genes.

OOCDB - Organ on a Chip Database

Southeast University
Organ on a Chip Database

Home Database Submission About Help Lab data

Tissue Enrichment Analysis

Please select the service

Compare to the standard datasets in this database

Compare to customer provided datasets

Compare to the standard datasets in this database

Paste your gene list here:
gene1
gene2
gene3
...

Or choose your input file here

To choose the dataset to compare with

The user provided list of genes can be pasted here

The user provided list of genes can be pasted here

OCCDB - Organ on a Chip Database

Home Database Submission About Help Lab data

Gene ID Converter

AQP10
 AQP10 - aquaporin 10

AQP9
 AQP9 - aquaporin 9

ATP2A1
 ATP2A1 - ATPase sarcoplasmic/endoplasmic reticulum Ca2+ transporting 1

C4BPB
 C4BPB - complement component 4 binding protein beta

C8B

Next

Go to the next step of analysis

Select the gene to be analyzed

Parameters

The BH correction for multiple hypothesis test

Please choose the datasets for test

Human Protein Atlas

GTEx

Submit

Select whether to perform BH correction and the database for comparison

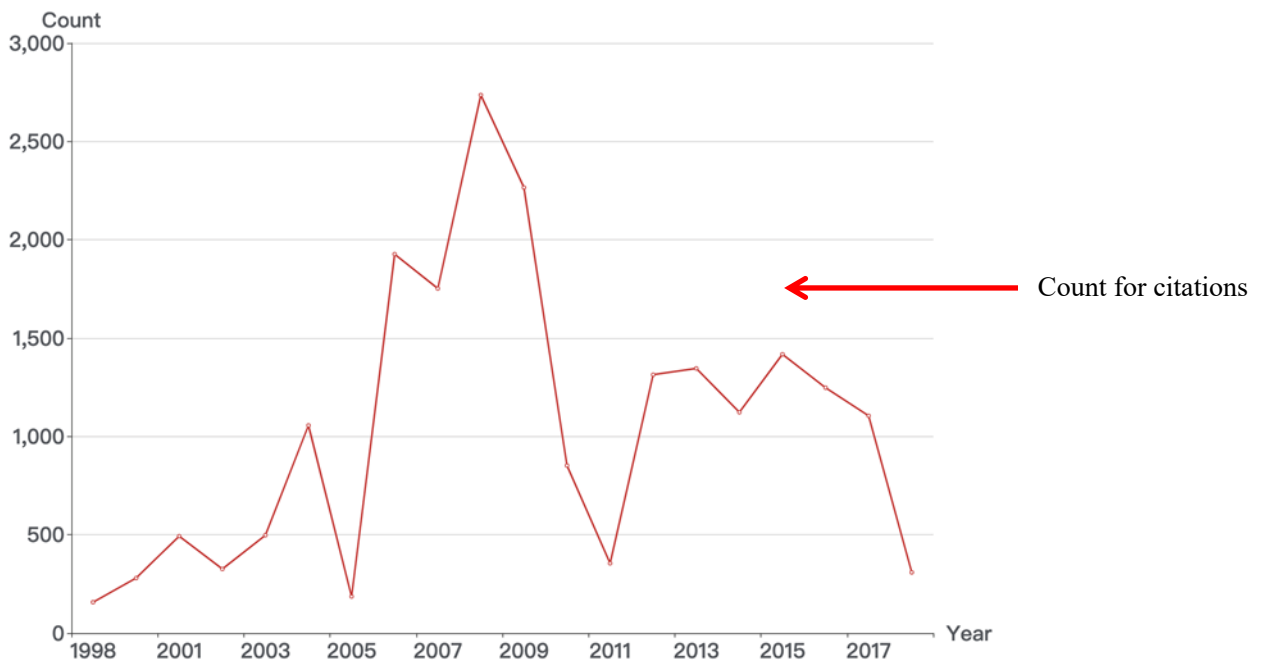
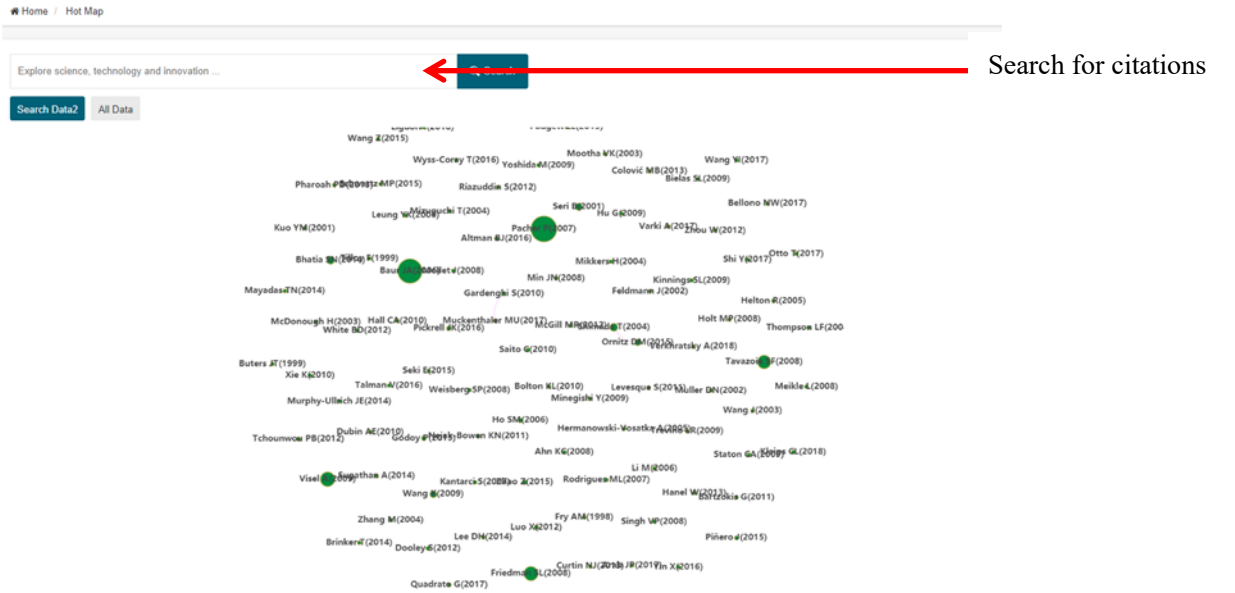


Download Analysis Results

2.3. Citation Map

The citation map is a tool used in OCCDB to analyze the citation situation in organ chips. Users can search for a field keyword in the search box of citation map. Citation map will search for authors in the organs-on-a-chip literature database based on the keywords searched by users and visually present them. In addition, users can click on all data to visualize the entire data. Figure shows that the size of the circle indicates the

number of papers cited by that author in the field, and the larger the circle, the more cited articles the author has in the field. In addition, the citation relationship, if any, of each author in the field is expressed in the citation map by connecting the lines. Moreover, a trend graph of publications in the field is given in Figure, showing the change in the number of studies cited on organs-on-a-chip over time.



3. Lab data

The organs-on-a-chip model supports search, filter, and download functions. Users can search directly for relevant organs-on-a-chip data or filter data by organ and/or simulation method to find the data they expected quickly and easily. Meanwhile, we provided the download function, allowing users to directly download the data they required. In addition, users can view detailed organs-on-a-chip data by clicking on “Detail,” which provides detailed information for each organs-on-a-chip.

The screenshot displays a web interface titled "The model of the organ-on-a-chip:". At the top, there is a search bar with a "Search" button and a "Filter" button. Below this is a table with the following columns: "Detail", "Name", "Organ", "Type", and "Data Download". The table lists several organ-on-a-chip models. Red arrows point to the search bar, the "Detail" column (specifically the eye icon for the first row), and the "Data Download" column (specifically the download icon for the second row). To the right of the interface, text labels with arrows indicate: "Search Lab Data" (pointing to the search bar), "View Lab Data" (pointing to the eye icon), and "Download Lab Data" (pointing to the download icon).

Detail	Name	Organ	Type	Data Download
	membrane barrier structures on a chip	cell	membrane	
	Multi-organoids-on-a-chip	All	Mix Former	
	Heart-on-a-chip	Heart	Muscle Bundle	
	Liver-on-a-chip	Liver	Multicellular Polyculture	
	Development of Composite Hydrogels for Tumor-on-a-chip	Tumor	Mix Former	
	evaluation of tumor spheroid behavior using deep learning-based recognition	Tumor	Mix Former	
	Vascular-on-a-chip	Vascular	Multicellular Polyculture	
	Branched Tissue-Engineered Vascular-on-a-chip	Vascular	Multicellular Polyculture	
	Vessels-on-a-chip	vessel	Multicellular Polyculture	

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