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# 25 YEARS *DEVTOX* WORKSHOPS: HISTORIC BACKGROUND, SCIENTIFIC AND TECHNICAL IMPROVEMENTS

Rupert Kellner

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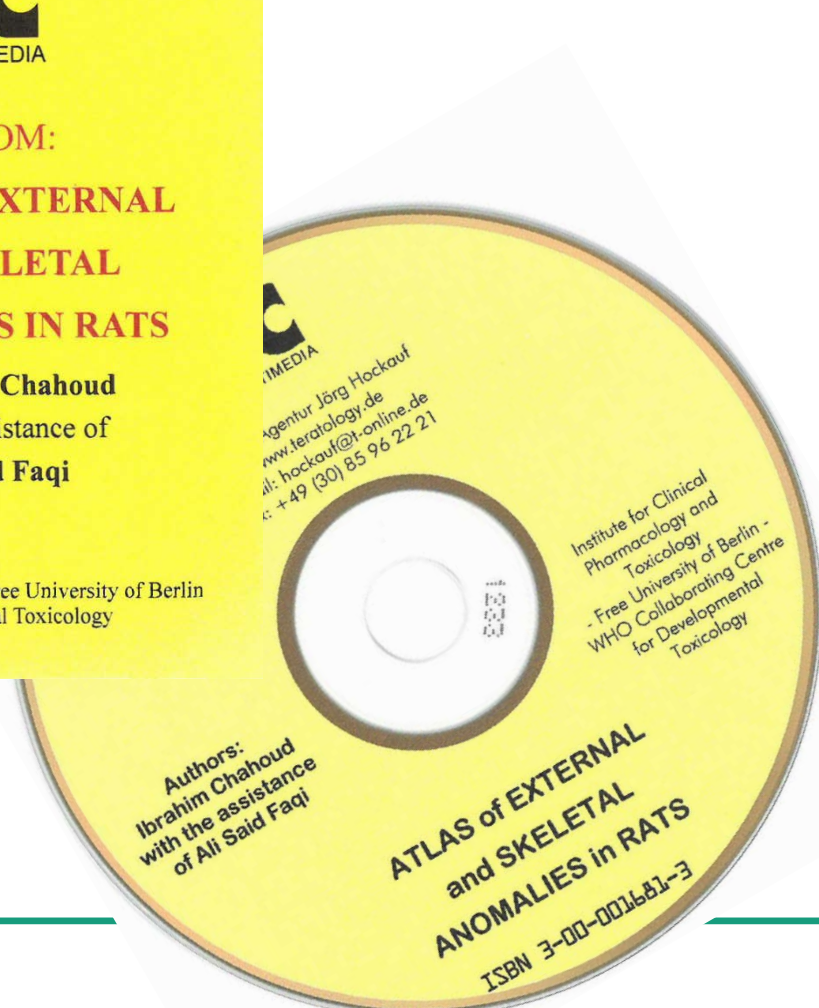
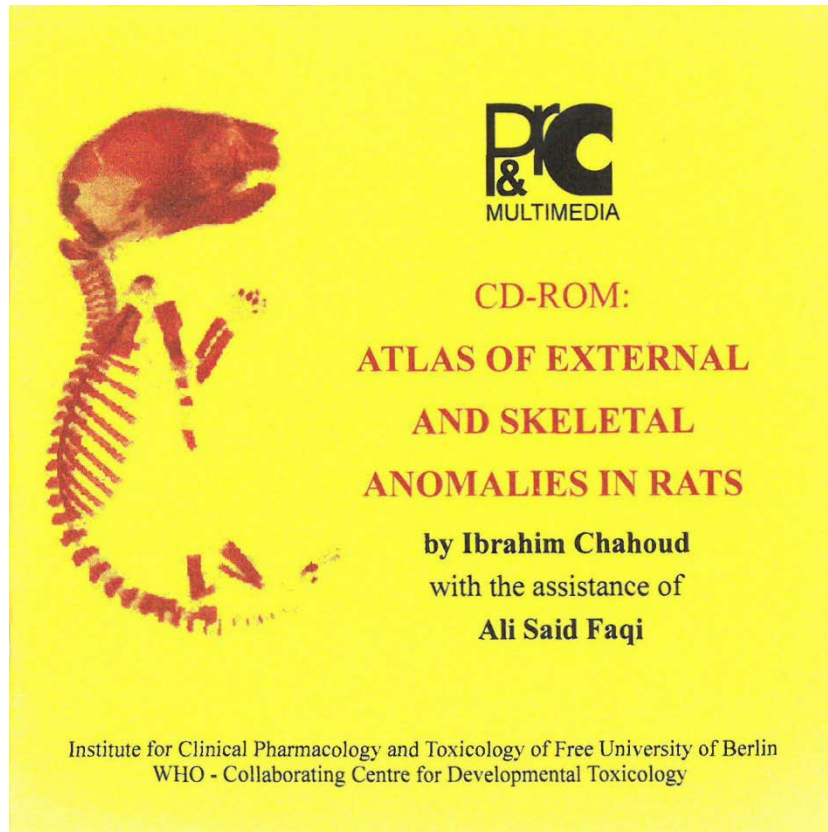
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# OVERVIEW

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- Starting point of *DevTox*
- First presentation on the Web
- Technical improvements
- Translation of *DevTox*
- *DevTox* perspectives

# Atlas of Anomalies in Rats




- CD-ROM: April 1997
- Based on IFTS harmonized glossary
- 140 findings
- 350 images

# Atlas of Anomalies in Rats

Atlas Of Anomalies, by Ibrahim Chahoud v1.20 produced by PR & C Agentur Berlin/Leipzig

**ATLAS OF EXTERNAL AND SKELETAL ANOMALIES IN RATS**

Ibrahim Chahoud  
with the assistance of  
Ali Said Faqi  
Institute for Clinical Pharmacology and Toxicology Berlin



Video-Start

Code-Number-List Pictures Nomenclature

Please click buttons to start !

Copyright:  
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MULTIMEDIA

ISBN 3-00-001681-3


One purpose of this Atlas of external and skeletal anomalies is to provide an objective basis for the implementation of a worldwide harmonization process of teratological terminology.

Berlin, 1997


Project Team

End

Atlas Of Anomalies, by Ibrahim Chahoud v1.20 produced by PR & C Agentur Berlin/Leipzig




CD-ROMs: Atlas of Anomalies in Rats, Rabbits, Mice and Marmosets are available at:  
PR & C Agentur  
Leipzig / Berlin  
Trendelenburgstr. 15  
D - 14057 Berlin  
Germany  
Fax: +49 (341) 86 29 283  
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Dr. Ali Said Faqi  
Project Assistant


Back



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Hans Figuhr  
Technical Assistance

# Atlas of Anomalies in Rats


Atlas Of Anomalies, by Ibrahim Chahoud v1.20 produced by PR & C Agentur Berlin/Leipzig

## External Anomalies



EXTERNAL ANOMALIES

## Skeletal Anomalies



SKELETAL ANOMALIES

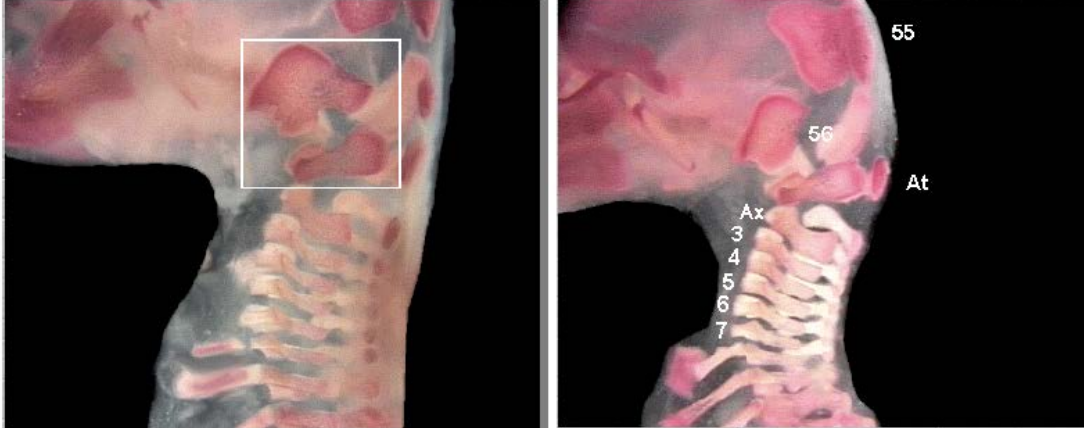
Please click buttons !

Back

Atlas Of Anomalies, by Ibrahim Chahoud v1.20 produced by PR & C Agentur Berlin/Leipzig

Letter / Number: **56**

Anatomical Term: **Exoccipital**



For anatomical terms type the letters or numbers in the picture !

First Page Back

produced by PR & C Agentur Berlin/Leipzig

REGION: **SKULL**  
**Exoccipital**

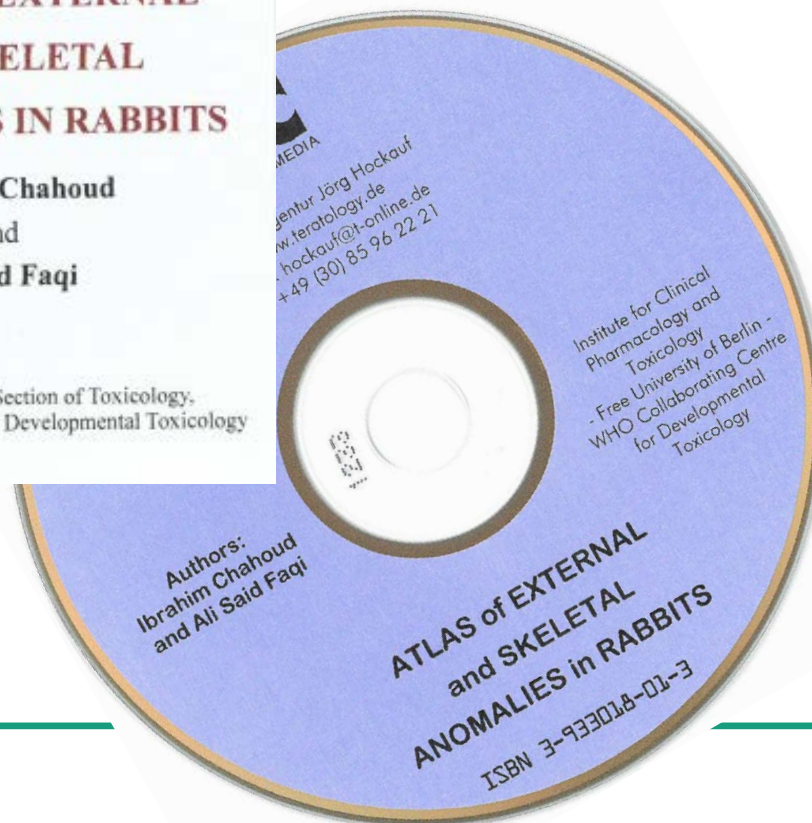
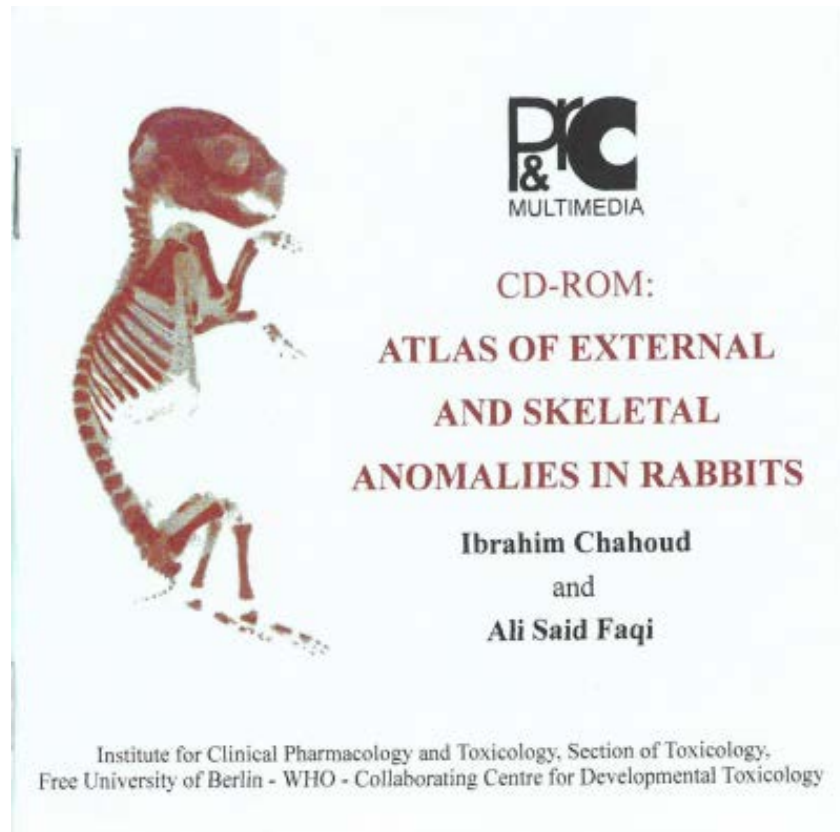
ANOMALY: **Misshapen (2/7)**  
*synonym or related term(s): Abnormally shaped, Irregularly shaped, \**

CODE-NR.: **2 2 56 04**

REMARK:  
**Exoccipital irregularly shaped, cervical rib**  
**Asymmetric**

< picture 1 picture 2 picture 3 picture 4 >

# Atlas of Anomalies in Rabbits



- CD-ROM: August 1997
- Based on IFTS harmonized glossary
- 104 findings
- 205 images

# Atlas of Anomalies in Rabbits

Atlas Of Anomalies, by Ibrahim Chahoud v1.20 produced by PR & C Agentur Berlin/Leipzig

REGION: SKULL  
Teeth (premaxilla)

ANOMALY: Misshapen

*Synonym or related term(s):* Abnormally shaped, Irregularly shaped

CODE-NR.: 2

REMARK:  
Additional tooth

Back Normal

Atlas Of Anomalies, by Ibrahim Chahoud v1.20 produced by PR & C Agentur Berlin/Leipzig

Letter / Number:  
Anatomical Term:

88

66 66

For anatomical terms type the letters  
or numbers in the picture !

First Page Back

- Additional CD-ROMs
- Marmosets  
October 1998
- Mice  
April 1999

# DevTox: Developmental toxicology

- Initiated in 1999
- Project funded by the Federal Institute for Risk Assessment (BfR, Berlin)
- Collaboration with:
  - Institute of Clinical Pharmacology and Toxicology, Department of Toxicology (Charité, Berlin)
  - Fraunhofer Institute for Toxicology and Experimental Medicine (ITEM, Hannover)
- Harmonized nomenclature for developmental toxicology
- Public Website: <https://www.devtox.org>



UNIVERSITÄTSMEDIZIN BERLIN





# DevTox Version 1

**DevTox** www.DevTox.org

A Resource for Developmental Toxicology

[.Background](#) [.Nomenclature](#) [.Data](#)

## Welcome

You have reached the Web site of the **DevTox Project**. This Web site is intended to provide a valuable resource for health professionals and researchers working in the field of developmental toxicology.

There are three areas accessible on this site from the menus above, reflecting the main parts of the project:

- ▶ **DevTox .Background**  
More information on the **project** itself, the publications of the Berlin **DevTox workshops** and a list of **project partners**.
- ▶ **DevTox .Nomenclature**  
The **harmonized nomenclature** for developmental toxicology, based on the IFTS terminology: More than **1.000 images** show examples for **external**, **skeletal** and **soft tissue** anomalies.
- ▶ **DevTox .Data**  
An electronic **data base** (under development), consisting of historical control data in various strains of common laboratory animals.

The **DevTox Project** was initiated by the German Federal Institute for Risk Assessment (BfR, formerly BgVV). It was sponsored by the German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety under the auspices of the IPCS.

In order to make ongoing improvements to this Web site, your comments and suggestions are most welcome. Please direct your comments to the **DevTox Project co-ordinator** at [coordinator@DevTox.org](mailto:coordinator@DevTox.org). If you would like to contribute images, [please click here](#).

Last update: 24-Oct-2002 | Contact: [coordinator@DevTox.org](mailto:coordinator@DevTox.org)

- Website
  - HTML pages
- Version from 2002
- >1000 images

# DevTox Version 1 (2002)

**DevTox** www.DevTox.org  
A Resource for Developmental Toxicology

[.Background](#) [.Nomenclature](#) [.Data](#)

## DevTox.Background: Berlin DevTox workshops

Since 1995, four Workshops on the Terminology in Developmental Toxicology have been held in Berlin.

The **first Workshop**, in 1995, discussed the uses and misuses of the IFTS glossary, which is presented in the publication of the first report.  
Wise et al., (1997) Terminology of developmental abnormalities in common laboratory mammals. *Reprod Toxicol* 11:292  
▶ [PubMed abstract](#)

The **second Workshop**, in 1998, discussed the advantages of using a classification system for fetal malformations. The workshop agreed on definitions for two classification categories which were "malformation" and "variation".  
Chahoud et al., (1999) Classification terms in developmental toxicology: need for harmonisation. *Reprod Toxicol* 13:103-110  
▶ [PubMed abstract](#)  
▶ [Science Direct article](#)

The **third Workshop**, in 2000, discussed the categorization of the skeletal observations listed in the IFTS. The workshop agreed on the classification system agreed at the second Berlin Workshop.  
Solecki R et al., (2001) Harmonisation of rat fetal skeletal terminology and classification. *Reprod Toxicol* 15:103-110  
▶ [PubMed abstract](#)  
▶ [Science Direct article](#)

The **fourth Workshop**, in 2002, discussed the categorization of external and soft tissue anomalies listed in the IFTS, using the classification system agreed at the second Berlin Workshop.  
The manuscript is in preparation but is anticipated to be submitted for publication in December 2002.

↑ Last update: 20-Aug-2002 | Contact: [coordinator@DevTox.org](mailto:coordinator@DevTox.org)

**DevTox** www.DevTox.org  
A Resource for Developmental Toxicology




[.Background](#) [.Nomenclature](#) [.Data](#)

## DevTox.Background: Project partners

The following organizations have been involved in the development and realization of the **DevTox** project:

- ▶ Federal Institute for Risk Assessment (BfR)  
(formerly BgVV)  
FG 701  
Thielallee 88-92  
D-14195 Berlin  
Germany
- ▶ Fraunhofer Institute of Toxicology and Aerosol Research  
Drug Research and Clinical Inhalation  
Nikolai-Fuchs-Str. 1  
D-30625 Hannover  
Germany
- ▶ Institute of Clinical Pharmacology and Toxicology  
Department of Toxicology  
Free University Berlin  
Garystrasse 5  
D-14195 Berlin  
Germany

▶ In addition, the valuable contribution of many prominent international scientists from research institutions, regulatory agencies, and industry is gratefully acknowledged.



↑ Last update: 10-Aug-2002 | Contact: [coordinator@DevTox.org](mailto:coordinator@DevTox.org)

# DevTox Version 1 (2002)

Home ? Help Configuration **DevTox** Rat Mouse Rabbit Other

External Findings **Skeletal Findings** Soft Tissue Findings show as  List View  Tree View

Skeletal Findings	①	②	③	④	Exoccipital	①	②	③	④
• Skull	✓	✓	✓	✓	Absent	M	M	M	M
•• Alisphenoid	✓	✓	✓	✓	Fused	M	M	M	M
•• Auditory ossicles	✓	✓	✓	✓	Hole(s)	✓	✓	✓	✓
• Basioccipital	✓	✓	✓	✓	Incomplete ossification	V	V	V	V
•• Basisphenoid	✓	✓	✓	✓	Misshapen	✓	✓	✓	✓
•• Exoccipital	✓	✓	✓	✓					
•• Frontal	✓	✓	✓	✓					
• Hyoid	✓	✓	✓	✓					
• Interparietal	✓	✓	✓	✓					
•• Lacrimal	✓	✓	✓	✓					
•• Mandible	✓	✓	✓	✓					
•• Maxilla	✓	✓	✓	✓					
•• Nasal	✓	✓	✓	✓					
• Palatine	✓	✓	✓	✓					
•• Parietal	✓	✓	✓	✓					
•• Premaxilla	✓	✓	✓	✓					
•• Presphenoid	✓	✓	✓	✓					
•• Squamosal	✓	✓	✓	✓					
• Supraoccipital	✓	✓	✓	✓					
•• Tympanic annulus	✓	✓	✓	✓					
• Vomer	✓	✓	✓	✓					
•• Zygomatic	✓	✓	✓	✓					
• Vertebra	✓	✓	✓	✓					
• Cervical vertebra	✓	✓	✓	✓					
•• Cervical centrum	✓	✓	✓	✓					
•• Cervical centrum cartilage	✓	✓	✓	✓					
•• Cervical arch	✓	✓	✓	✓					
• Thoracic vertebra	✓	✓	✓	✓					
•• Thoracic centrum	✓	✓	✓	✓					

Home Locations Findings Manuscript Comments ? Help **DevTox** Rat Mouse Rabbit Other

Exoccipital – Misshapen Skeletal finding

**Synonym(s):** Abnormally shaped; Irregularly shaped  
**Non-preferred term(s):** –

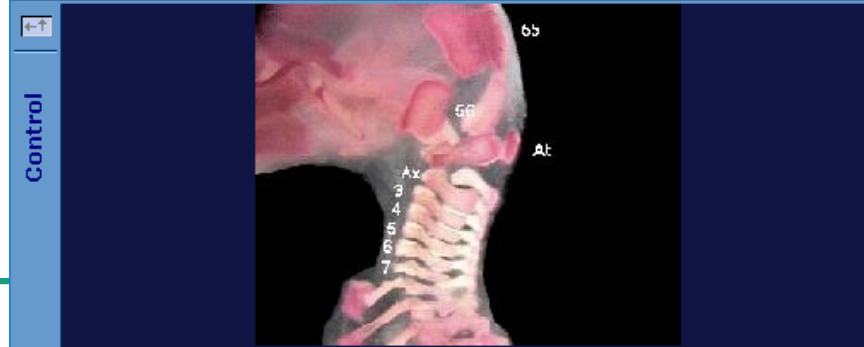
**Definition:**  
 Abnormally shaped [Not to be used to describe sites of incomplete ossification].

**Notes:**  
 –

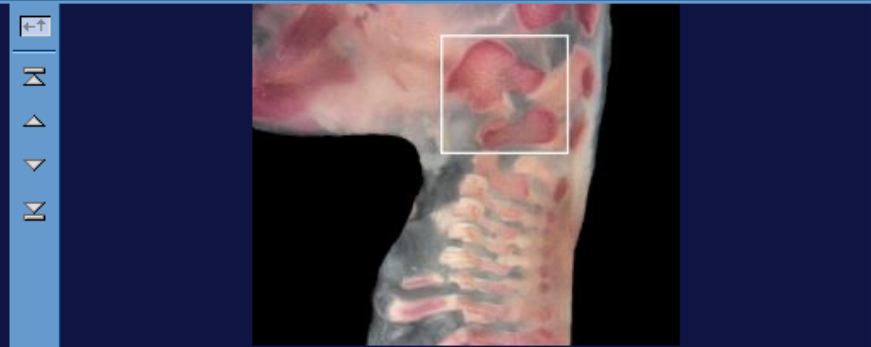
**Fig. 1:** Exoccipital bone fused with a bone of atlas-like structure  
*Additional finding:* Cervical rib

**Fig. 2:** Exoccipital bone irregularly shaped  
*Additional finding:* Cervical rib

**Fig. 3:** –



Rat, Exoccipital: control image



**Fig. 2:** Rat, Exoccipital – Misshapen.  
 Exoccipital bone irregularly shaped  
*Additional finding:* Cervical rib

# DevTox Version 1 (2002)

- External Findings

- 396 images (288 anomalies, 108 control)

- Skeletal Findings

- 570 images (390 anomalies, 180 control)

- Soft Tissue Findings

- 92 images (79 anomalies, 13 control)

- Species

- Rat: 532 images
- Mouse: 392 images
- Rabbit: 134 images
- Other (placeholder)

- HTML tree

- 4340 files

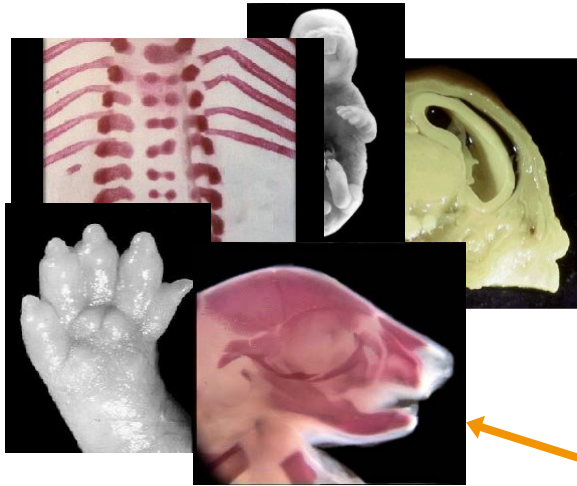
- 9549 files

- 4290 files

- Difficult to handle

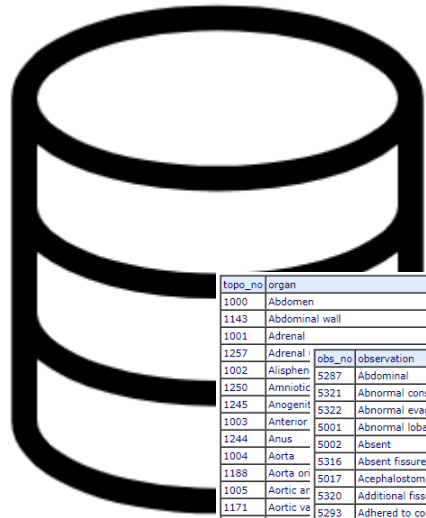
- Advantage:  
Offline usage (could be put on CD)

# DevTox Version 2 (2004)

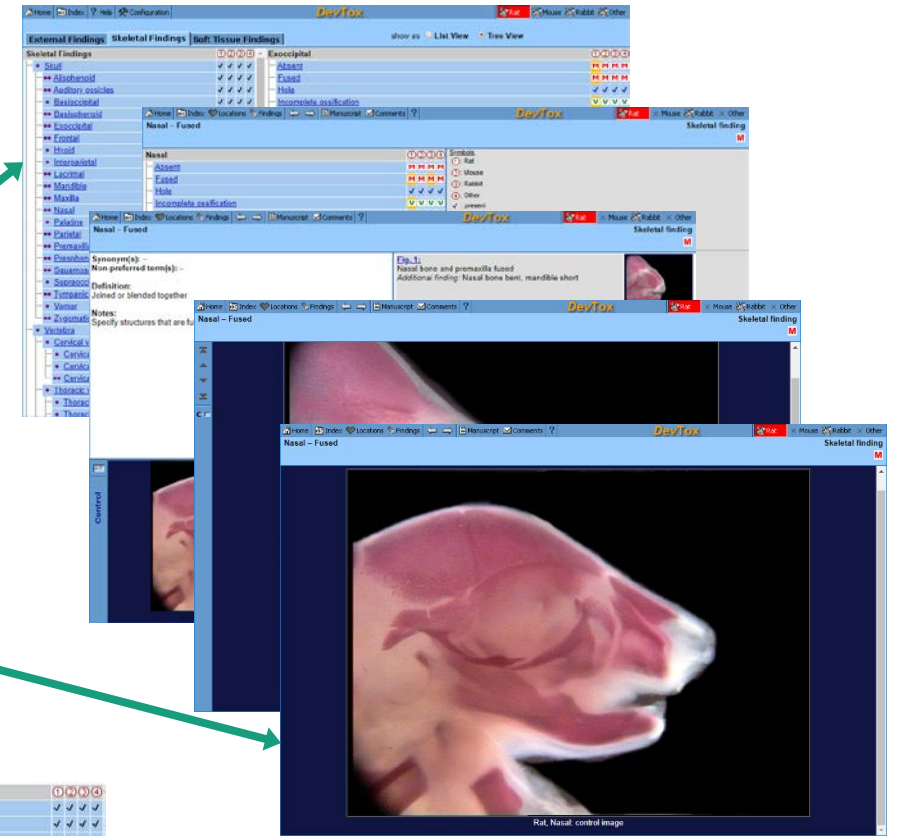


32 files

php



topo_no	organ	paired	species_def	
1000	Abdomen	-	1111111111	
1143	Abdominal wall	-	1111111111	
1001	Adrenal	P	1111111111	
1257	Adrenal	obs_no	observation	species_def
1002	Alisphen	5287	Abdominal	1111111111
1250	Anmotic	5321	Abnormal consistency	1111111111
1245	Anogenit	5322	Abnormal evagination	1111111111
1003	Anterior	5001	Abnormal lobation	1111111111
1244	Anus	5002	Absent	1111111111
1004	Aorta	5316	Absent fissure	1111111111
1188	Aorta on	5017	Acephalostomia	1111111111
1005	Aortic ar	5320	Additional fissure	1111111111
1171	Aortic va	5293	Adhered to cornea	1111111111
1193	Aorticop	5349	Altered consistency	1111111111
1159	Aqueous	5336	Altered surface texture	1111111111
1189	Artery	5294	Altered texture	1111111111
1140	Atlas, ve	5027	Anencephaly	1111111111
1172	Atrial sd	5028	Aneurysm	1111111111
1173	Atrium	5262	Asymmetric	1111111111
1006	Auditory	5264	Asymmetric ossification	1111111111
1174	A-V cans	5040	Atritic	1111111111
1175	A-V osti	5043	Bent	1111111111
1176	A-V sept	5342	Bifurcated	1111111111
1007	Azygos v	5310	Bilateral	1111111111
1008	Basioccl	5044	Bilobed	1111111111
1009	Basisphe	5045	Binipartite ossification	1111111111



Skeletal findings		Skeletal Findings	
Alisphenoid	✓✓✓✓	Skull	✓✓✓✓
Auditory ossicles	✓✓✓✓	Alisphenoid	✓✓✓✓
Basioccipital	✓✓✓✓	Auditory ossicles	✓✓✓✓
Basisphenoid	✓✓✓✓	Basioccipital	✓✓✓✓
Calcaneus	✓✓✓✓	Basisphenoid	✓✓✓✓
Carpal	✓✓✓✓	Exoccipital	✓✓✓✓
Caudal arch	✓✓✓✓	Frontal	✓✓✓✓
Caudal centrum	✓✓✓✓	Hyoid	✓✓✓✓
Caudal vertebra	✓✓✓✓	Intersadetal	✓✓✓✓
Cervical arch	✓✓✓✓	Lacrimal	✓✓✓✓
Cervical centrum	✓✓✓✓	Mandible	✓✓✓✓
Cervical centrum cartilage	✓✓✓✓	Maxilla	✓✓✓✓
Cervical vertebra	✓✓✓✓	Nasal	✓✓✓✓
Clavicle	✓✓✓✓	Palatine	✓✓✓✓
Exoccipital	✓✓✓✓	Parietal	✓✓✓✓
Femur	✓✓✓✓	Premaxilla	✓✓✓✓
Fibula	✓✓✓✓	Prasphenoid	✓✓✓✓
Forepaw phalanx	✓✓✓✓	Squamosal	✓✓✓✓
Frontal	✓✓✓✓	Supraoccipital	✓✓✓✓
Hindpaw phalanx	✓✓✓✓	Tympanic annulus	✓✓✓✓
Humerus	✓✓✓✓	Vomer	✓✓✓✓
Hyoid	✓✓✓✓	Zygomatic	✓✓✓✓
Ilium	✓✓✓✓		
Interparietal	✓✓✓✓	Vertebra	✓✓✓✓
Ischium	✓✓✓✓	Cervical vertebra	✓✓✓✓
Lacrimal	✓✓✓✓	Cervical centrum	✓✓✓✓
Lumbar arch	✓✓✓✓	Cervical centrum cartilage	✓✓✓✓
Lumbar centrum	✓✓✓✓	Cervical arch	✓✓✓✓
Lumbar centrum cartilage	✓✓✓✓	Thoracic vertebra	✓✓✓✓
Lumbar vertebra	✓✓✓✓	Thoracic centrum	✓✓✓✓
Mandible	✓✓✓✓	Thoracic centrum cartilage	✓✓✓✓
Maxilla	✓✓✓✓		

# DevTox Images in Version 2 (2009)

- Last release on December 09, 2009
  - with 371 new images
- >1.700 images
- Anomalies per species
  - Rat: 677 images
  - Mouse: 259 images
  - Rabbit: 314 images
  - Other: 53 images  
incl. Hamster, Monkey, Quail
- New findings

The screenshot displays the DevTox website interface. At the top, the DevTox logo is visible, along with the tagline 'A Resource for Developmental Toxicology' and the URL 'www.DevTox.org'. A navigation menu includes links for '.Background', '.Nomenclature', '.Data', and '.Masthead'. The main content area features a 'Welcome' message and a list of project areas: 'DevTox .Background', 'DevTox .Data', and 'DevTox .Masthead'. A search result for 'Gallbladder - Supernumerary' is shown, with a small thumbnail image of a rabbit's gallbladder. The result includes a definition, synonyms, and notes. A larger image of the gallbladder is shown in a separate window, with the caption 'Fig. 1: Rabbit, Gallbladder - Supernumerary.' The website footer indicates the last update date as '11-Nov'.

# New Terminology

- Terminology of developmental anomalies (version 2)
- Published by Makris et al. 2009
- Changes necessary in the *DevTox* Nomenclature

Diagnoses	External	Skeletal	Visceral	Maternal-Fetal
Number old	151	467	277	(2)
- delete	38	11	17	
- rename	113	456	260	2
- add	54	567	273	17
Number new	167	1023	533	19



Terminology of developmental abnormalities in common laboratory mammals (version 2)<sup>☆,☆☆</sup>

Susan L. Makris<sup>a,\*,1,4</sup>, Howard M. Solomon<sup>b,1,4</sup>, Ruth Clark<sup>c,2,4</sup>, Kohei Shiota<sup>d,3,4</sup>, Stephane Barbellion<sup>e,2</sup>, Jochen Buschmann<sup>f,2</sup>, Makoto Ema<sup>g,3</sup>, Michio Fujiwara<sup>h,3</sup>, Konstanze Grote<sup>i,2</sup>, Keith P. Hazelden<sup>j,1</sup>, Kok Wah Hew<sup>k,1</sup>, Masao Horimoto<sup>l,3</sup>, Yojiro Ooshima<sup>m,3</sup>, Meg Parkinson<sup>n,2</sup>, L. David Wise<sup>o,1</sup>

# Changes in Terminology

- Example: Visceral findings

Old No.	Local.	Finding	New No.	Localization	Finding
3.1005.5040	Aortic arch	Atresia	3.1005.5040	Aortic arch	Atretic
3.1005.5072	Aortic arch	Dilated	3.1005.5072	Aortic arch	Dilated
3.1047.5008	Heart	Absent left A-V valve	3.1179.5002	Left A-V valve	Absent
3.1047.5094	Heart	Enlarged left A-V valve	3.1179.5088	Left A-V valve	Large
3.1047.5175	Heart	Misshapen left A-V valve	3.1179.5172	Left A-V valve	Misshapen
3.1047.5216	Heart	Small left A-V valve	3.1179.5211	Left A-V valve	Small
3.1047.5008	Heart	Enlarged atrial chamber	3.1173.5088	Atrium	Large
			3.1173.5172	Atrium	Misshapen
			3.1173.5211	Atrium	Small

Image

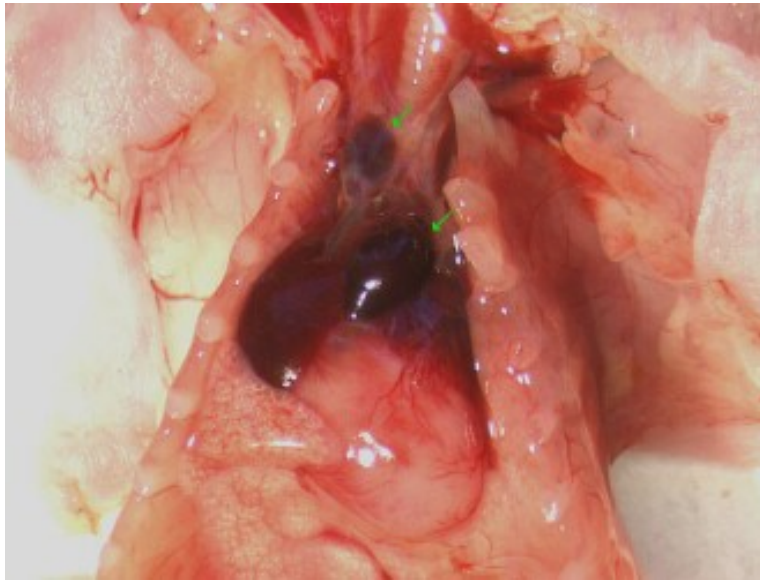
Image

Image



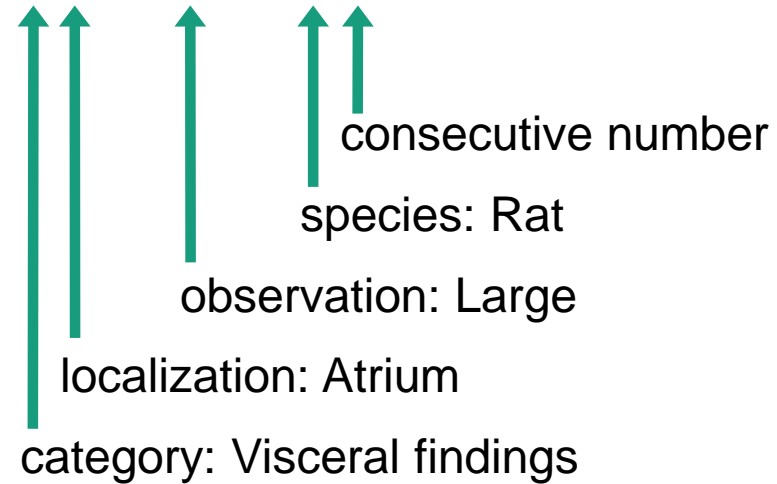
# DevTox Images

## ■ Example: Atrium – Large



3.1047.5091-1-02 (old)

3.1173.5088-1-02 (new)



# DevTox Version 3 (2012)

**DevTox** A Resource for Developmental Toxicology

www.DevTox.org

.Background .Nomenclature .Data .Masthead

## Welcome

You have reached the relaunched Web site of the **DevTox Project (Version 3.0)**.

This Web site is intended to provide a valuable resource for health professionals and researchers working in the field of developmental toxicology and represents one of the most comprehensive sources of images of developmental abnormalities.

There are three areas accessible on this site from the menus above, reflecting the main parts of the project:

- ▶ **DevTox .Background**  
Supplementary information on the **project** itself, the publications of the **DevTox Project** and the **Berlin workshops**, a list of **project partners** and relevant **links**.
- ▶ **DevTox .Nomenclature**  
The updated **harmonized nomenclature** for developmental toxicology, based on the revised IFTS terminology (Makris et al. 2009): More than **2.500 images** show examples for **external**, **skeletal**, **soft tissue** and **maternal-fetal** anomalies [last update October 2012].
- ▶ **DevTox .Data**  
An electronic **data base** is under development, in which experimental data from developmental studies in rats and rabbits in different labs can be evaluated to develop a historical control data base in various strains of common laboratory animals.

The **DevTox Project** was initiated by the German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) and the Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU) under the auspices of the International Programme on Chemical Safety (IPCS).

In order to make ongoing improvements to this Web site, your comments and suggestions are most welcome. Please direct your comments to the **DevTox Project** co-ordinator at [DevTox@bfr.bund.de](mailto:DevTox@bfr.bund.de). If you would like to contribute

- Launched on August 16, 2012
- New nomenclature
  - Maternal-fetal category
- Additional species / images
  - Hamster
  - Primate
  - Bird
- >2500 images
  - incl. post-natal images

# Selection Lists for Anomalies in DevTox

Pre-2012

①	②	③	④	Symbol:
M	M	M	M	①: Rat
M	M	M	M	②: Mouse
✓	✓	✓	✓	③: Rabbit
✓	✓	✓	✓	④: Other
✓	✓	✓	✓	✓: present
✓	✓	✓	✓	—: absent
✓	✓	✓	✓	M: malformation
✓	✓	✓	✓	V: variation
✓	✓	✓	✓	☐: image(s) available

Mandible	Mandible	2016	①	②	③	④	⑤	⑥	⑦	⑧	⑨
<a href="#">Absent</a>	<a href="#">Absent</a>										
<a href="#">Bent</a>	<a href="#">Bent</a>										
<a href="#">Fused</a>	<a href="#">Fused</a>						✓				
<a href="#">Hole</a>	<a href="#">Hole</a>										
<a href="#">Incomplete ossification</a>	<a href="#">Incomplete ossification</a>		✓								
<a href="#">Increased ossification</a>	<a href="#">Increased ossification</a>										
<a href="#">Isolated ossification site</a>	<a href="#">Isolated ossification site</a>										
<a href="#">Large</a>	<a href="#">Large</a>										
<a href="#">Long</a>	<a href="#">Long</a>										
<a href="#">Malpositioned</a>	<a href="#">Malpositioned</a>										
<a href="#">Misaligned</a>	<a href="#">Misaligned</a>										
<a href="#">Misshapen</a>	<a href="#">Misshapen</a>				✓						
<a href="#">Short</a>	<a href="#">Short</a>		✓			✓				✓	
<a href="#">Single incisor socket</a>	<a href="#">Single incisor socket</a>										
<a href="#">Small</a>	<a href="#">Small</a>		✓	✓							
<a href="#">Splayed</a>	<a href="#">Splayed</a>										
<a href="#">Supernumerary</a>	<a href="#">Supernumerary</a>										
<a href="#">Supernumerary site</a>	<a href="#">Supernumerary site</a>										
<a href="#">Thick</a>	<a href="#">Thick</a>										
<a href="#">Thin</a>	<a href="#">Thin</a>										
<a href="#">Unossified</a>	<a href="#">Unossified</a>										
<a href="#">Unossified area</a>	<a href="#">Unossified area</a>										

According to:  
Survey in 2013  
Workshop 2014

Symbols:

- ①: Rat (Ra)
- ②: Mouse (Mo)
- ③: Rabbit (Rb)
- ④: Hamster (Ha)
- ⑤: Primate (Pr)
- ⑥: Guinea Pig (Gp)
- ⑦: Minipig (Mp)
- ⑧: Dog (Do)
- ⑨: Bird (Bi)
- : absent in species
- : malformation
- : grey zone
- : variation
- ✓: image(s) available
- P: post-natal image(s) available

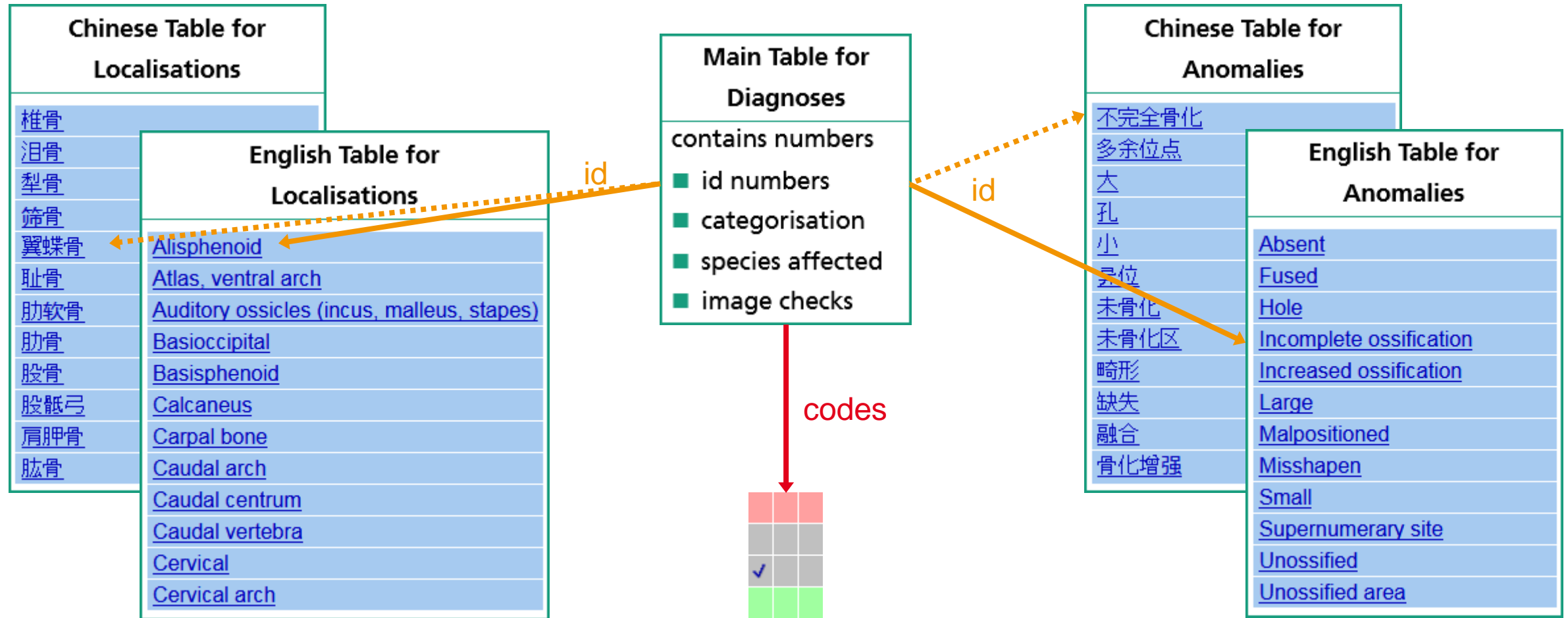
# Translation of *DevTox*

## Translation into Chinese

- Proposal / templates in 2014
- Translation in China (Dr. Weihua Li)
  - Shanghai Institute of Planned Parenthood Research
  - WHO Collaboration Centre for Research in Human Reproduction
  - Fudan University
- Final checks at BfR (Dr. Wenna Xu)
- Release to the public on October 28, 2016



# Internal Structure of the Database



# New Abstraction Level

## Reduction of the variety of text sources

### Original English version

- Text files (HTML)
- PHP program scripts (Server)
- Database tables
- JavaScript programs (Browser: Menus)
- Button icons with info



### Modified English version

- Text files (PHP)
- Database tables

Can be applied to other languages

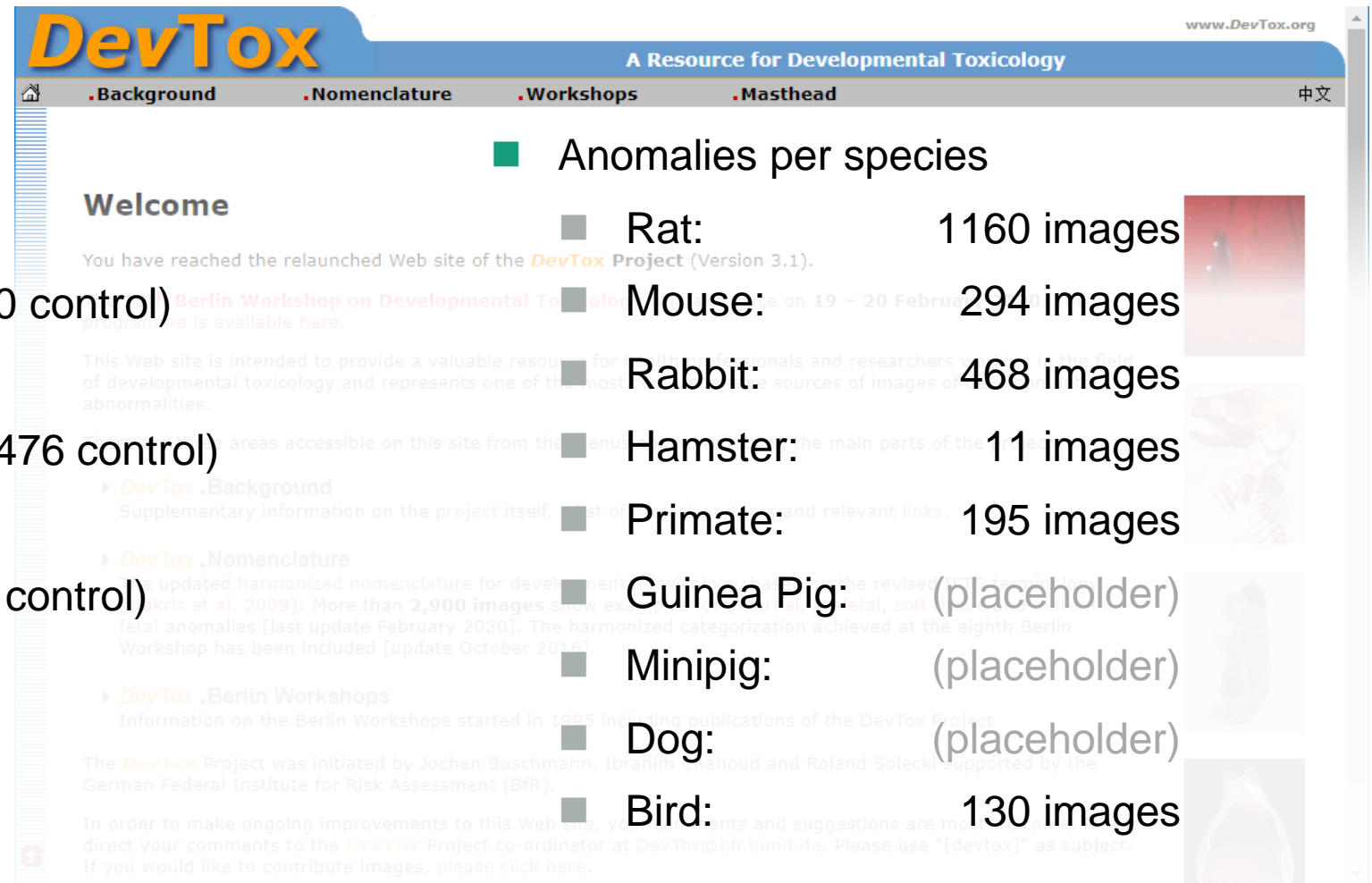
Chinese, ...

# DevTox Version 3.1 (2020)

>2900 images:

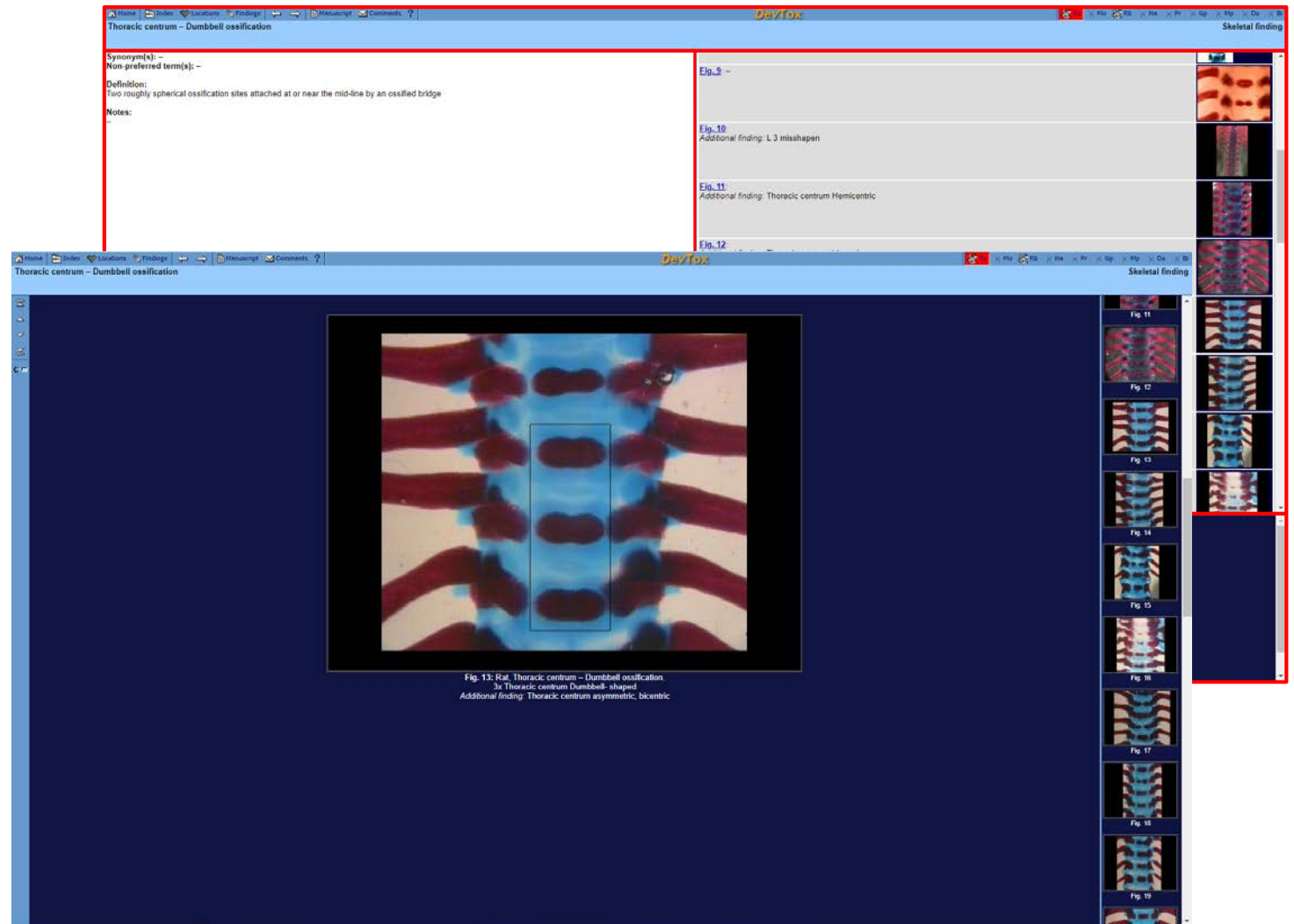
- External Findings
  - 678 images (508 anomalies, 170 control)
- Skeletal Findings
  - 1964 images (1488 anomalies, 476 control)
- Soft Tissue Findings
  - 308 images (262 anomalies, 46 control)

- Anomalies per species
  - Rat: 1160 images
  - Mouse: 294 images
  - Rabbit: 468 images
  - Hamster: 11 images
  - Primate: 195 images
  - Guinea Pig: (placeholder)
  - Minipig: (placeholder)
  - Dog: (placeholder)
  - Bird: 130 images



# DevTox Perspectives

- Current layout for 4:3 screens
  - Mode A: 800 x 600 pixel
  - Mode B: 1024 x 768 pixel
- Split into several frames
  
- Could be replaced by a modern layout





**Thank you for your attention!**

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