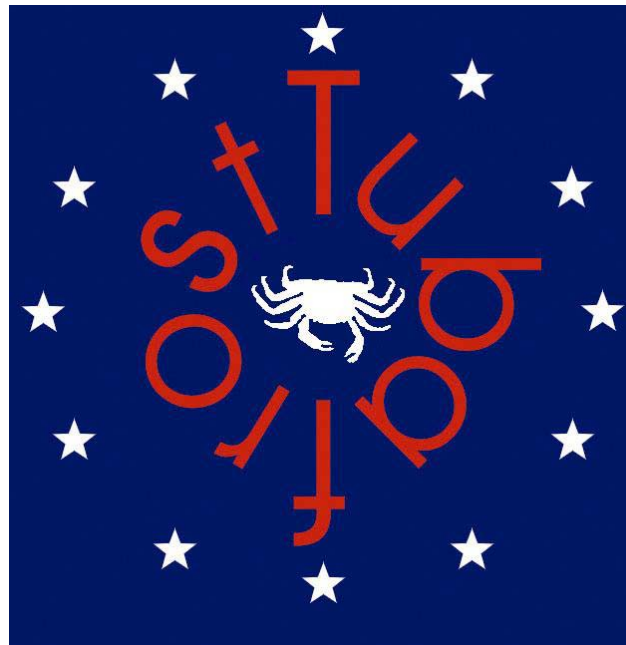


Quality of Life and Management of Living Resources
European Human Frozen Tumor Tissue Bank

TUBAFROST
QLRI-CT-2002-01551

Deliverable D 4.3

Search engine



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This deliverable (4.3) describes the tools that were developed for the online search engine, tissue-shopping cart and the tissue-order request system, making the central database accessible through the Internet. This deliverable is part of Work Package 4: “Hard and software for coordinated tissue storage”.

Introduction

The first section of this deliverables describes the procedures on using the search engine to look for tissue samples for a research project and then how to add the resulting search results to a tissue-shopping cart.

The second section of the deliverable explains how a tissue-order request can be created from the contents of the tissue-shopping cart and what is completed on this order request form to be submitted to the TuBaFrost central office and collectors.

The third section explains the order management tools that can be used by the members of the TuBaFrost central office, collectors and requestors to review the tissue orders created by the requestors and allow central office to send reminders or collectors to allow or deny access to the tissue items.

Finally Appendix A provides the technical details (database structure, relationships and webpage flow) of the central database system, search engine and tissue request system.

TuBaFrost Search Engine and Tissue Request System

Login Page (Home Page):
<http://www.eortc.be/vtb/demo/vtb/tubafrost/temptissue/searchengine/sedefault.asp>

TuBaFrost Central Database Search Engine

Number of Patient Case records currently in system: 904
Number of Tissue Sample records currently in system: 965

Username
Password

[REGISTRATION](#)

[Forgotten your username or password??](#)

- Clicking registration will take the user to a form which they will complete with their details (Firstname, Lastname, e-mail address, phone number etc..). After submission

an e-mail is sent to the database administrator automatically who can enter the user into the system. The user will then receive their login details via e-mail.

- The requestor, who has registered, can login into the search engine by entering his/her username and password and clicking 'Login' which open the 'search parameters' page.
- 'Forgotten your username or password' - this link will open a page where the user will be prompted to enter their e-mail address (given during initial registration). The system will then automatically send the user's username and password to their e-mail account if they are found in the system.

Search Parameter Page

This page will allow the requestor to set or enter a number of search parameters into a form (e.g. site of tumor, histopathological diagnosis, age at time of biopsy, gender/sex etc...). The ALL or ANY option at the top of the form will select whether the system will perform a search where 'all' parameters must be found in a tissue sample record or where 'any' parameter can be found. The ALL option is selected by default for a more accurate search. The keyword search can be set to search for mention of any of the key words entered or exact keyword phrase match for more accurate search.

The site of tumor (topography) and histopathological diagnosis (morphology) can be selected from an ICDO-3 code list or an entered code and text can be checked by clicking 'check ICDO-3 database'.

The collector institutes to be searched in can be selected or deselected by checking or unchecking the checkboxes. All institutes are checked by default. Clicking 'Submit parameter search' will submit the search parameters.

Search-Parameters:

Submit Parameter Search RESET

ALL ANY
(ALL = system will search the database for tissue records matching all search parameters;
 ANY=system will search the database for tissue records where at least one search parameter is found)

Keyword(s):	<input type="text"/>
	<input checked="" type="radio"/> Any keyword <input type="radio"/> Match keyword phrase
Site of tumor:	SKIN <input type="button" value="Show ICDO-3 list"/> <input type="button" value="Check ICDO-3 database"/>
Tumor Condition:	Tumor
Histopathological Diagnosis (inc SNOMED Code):	Malignant melanoma, NOS <input type="button" value="Show ICDO-3 list"/> <input type="button" value="Check ICDO-3 database"/>
Stage (and TNM):	<input type="text"/>
Grade:	<input type="text"/>
Age at time of biopsy/sampling (years):	20-30 <small>(e.g. <51; >49; 40-50; 34-34)</small>
Gender/Sex:	Male
Involved in clinical trial (yes/no); if yes: trial and patient reference:	<input type="text"/>
Medical History/Treatment/Complications/Secondary Tumors/Lab data:	<input style="width: 100%; height: 50px;" type="text"/>
Other:	<input type="text"/>
Collector Institutes:	<input type="checkbox"/> EORTC <input checked="" type="checkbox"/> Erasmus Medical Center <input type="checkbox"/> Institut Gustav Roussy <input type="checkbox"/> NTRAC <input checked="" type="checkbox"/> <input type="checkbox"/> University Hospital Leuven <input type="checkbox"/> Dutch Cancer Institute <input checked="" type="checkbox"/> CNIO <input checked="" type="checkbox"/> University of Vienna <small>(AKW) <input checked="" type="checkbox"/> Valencia Institute of Oncology <input checked="" type="checkbox"/> CRO Aviano</small>

Submit Parameter Search RESET

Search Results Page

The result page first performs the search on the central tissue database looking through each of the tissue sample records (and their associated patient case records) for possible matches. Every time a match is found a row is displayed in the table with the second column displaying the search parameters set initially and the third column displaying the match result and their exact values in the database.

Result	Parameter: All parameter Any Keyword	Match Value
Result 1	Search parameter value: Histopathological Diagnosis=malignant melanoma, nos Age at time of biopsy/sampling=20-30	Search match value: Histopathological Diagnosis 1=Malignant melanoma, NOS Age at time of biopsy/sampling=25
Result 2	Search parameter value: Histopathological Diagnosis=malignant melanoma, nos Age at time of biopsy/sampling=20-30	Search match value: Histopathological Diagnosis 1=Malignant melanoma, NOS Age at time of biopsy/sampling=27
Result 3	Search parameter value: Histopathological Diagnosis=malignant melanoma, nos Age at time of biopsy/sampling=20-30	Search match value: Histopathological Diagnosis 1=Malignant melanoma, NOS Age at time of biopsy/sampling=30
Result 4	Search parameter value: Histopathological Diagnosis=malignant melanoma, nos Age at time of biopsy/sampling=20-30	Search match value: Histopathological Diagnosis 1=Malignant melanoma, NOS Age at time of biopsy/sampling=28
Result 5	Search parameter value: Histopathological Diagnosis=malignant melanoma, nos Age at time of biopsy/sampling=20-30	Search match value: Histopathological Diagnosis 1=Malignant melanoma, NOS Age at time of biopsy/sampling=29
Result 6	Search parameter value: Histopathological Diagnosis=malignant melanoma, nos Age at time of biopsy/sampling=20-30	Search match value: Histopathological Diagnosis 1=Malignant melanoma, NOS Age at time of biopsy/sampling=24
Result 7	Search parameter value: Histopathological Diagnosis=malignant melanoma, nos Age at time of biopsy/sampling=20-30	Search match value: Histopathological Diagnosis 1=Malignant melanoma, NOS Age at time of biopsy/sampling=27

The first column displays a result link which, when clicked, will open a new window (TuBaFrost Patient/Tissue Information Page for Search Engine) displaying the tissue sample record and the patient case data entered by the collector.

TuBaFrost Patient/Tissue Information Page for Search Engine

a) Patient Case data:

Histopathological Diagnosis 1 (morphology):	Malignant melanoma, NOS
Histopathological Diagnosis 2:	-
Histopathological Diagnosis 3:	-
Stage (and TNM) <input type="checkbox"/>	-
Grade:	-
Age at time of biopsy/sampling (years):	25
Gender/Sex:	Male
Involved in clinical trial (yes/no); if yes: trial and patient reference:	-
Medical History/Treatment/Complications/Toxicity/Concomitant disease/Secondary Tumours/Laboratory data:	-
Comments:	-

b) Tissue sample data:

TuBaFrost Tissue Code:	TF10008140960 Add to Shopping Cart
Site of tumor/topography:	LYMPH NODES
Tissue condition:	tumor
Time (in hours and mins) elapsed after biopsy was performed and tissue sample was frozen <input type="checkbox"/>	30 min
Comment:	Snap frozen in liquid N2; Position 125 E10
Images:	
Virtual Slide Images:	

Tissue-Shopping Cart

Within the 'TuBaFrost Patient/Tissue Information Page for Search Engine' shown above there is link below the TuBaFrost Tissue code: 'Add to Shopping Cart'. When this link is clicked the tissue item is added to a tissue-shopping cart in the central database.

Tissue Shopping Cart		
Go to CheckOut		
Continue Shopping		
Item	TuBaFrost Tissue ID	Empty Cart of All Tissue Items
1	TF1000B140960	Remove item from Shopping Cart

The requestor can remove specific tissue items from the cart and empty the cart of all tissue items. He/she can continue to search for other tissue or continue to add tissue items to the cart by clicking 'continue shopping' which will close the window and return the user to the list of search results where he can modify the parameters on the form below the table of results or try a new search by clicking 'new search'.

Once the requestor has all the tissue items he/she wants in the shopping cart, they can click 'go to checkout' in the shopping cart window which will open the tissue-order request form. The requestor must then complete this form with information about the project, ethic committee information, research activities, financial support for the project etc... (as detailed in the tissue request form section of deliverable 6.2 - 'Policy and rules for monitoring and use of banked tissues in research '). The project PDF file can be uploaded with the request form by clicking browse and selecting the file from his/her computer. The tissue-order request form can now be submitted.

1 TF1000B140960	
First Name:	Martin
Last Name:	Isabelle
Institution Name:	EORTC
Address:	Avenue E Mounier, 83; Brussels; Belgium
E-mail:	mis@eortc.be
Phone Number:	+32 2 774 1033
Fax Number:	+32 2 774 0000
Research Project Description and experiments to be performed (250 characters max):	p53 gene analysis using melanoma samples.... Project file: C:\Backup\2005\EORTC Browse...
Number of samples necessary to carry out the research proposal:	56
Local Medical Ethics Commission (MEC) or Multi-centre Research Ethics Committee (MCREC):	Acquired approval? Yes Reference number of approval: HGDF55595 Address of MEC/MCREC: Chaussee Louvain, Brussels, Belgium Comments of the MEC/MCREC: project has been accepted
Additional clinical patient case data or tissue sample data required?	
	Publications in the last five years (only the five most important):

Once submitted the form and order details are entered into the central database, the requestor and TuBaFrost central office are automatically sent a copy of this form and link to the project file via e-mail. All the collectors who have collected tissue items that were included in the order are automatically sent a copy of the request form and link to the project by e-mail. In order to review and decide whether the tissue items can be used for the research project, the collectors can use the TuBaFrost Order Management system (described below). The TuBaFrost central office and requestors also use this management system to monitor the status of the tissue-order requests and take action when needed.

TuBaFrost Order Management System

Central Office

As a member of the central office, in the Table of Tissues page of the central database there will be a link "View Order History (Central Office)". The link is found on the first page after login at the central database when registered as member of the central office on the Institution Tissue Database page

Institution: EORTC	Tissue Database for Institution: EORTC	
User: Martin Isabelle	Order (descending) by <input type="text" value="Date tissue record added"/>	
Create New Tissue Record	Group by Local Patient Code	
Upload database record data		
View Order History [Central Office]	Local Inventory Tissue Code	Local Patient Case Code
View Order History [Collector]	testagain	B-1359372
Logout		
	testinqnew local inventory code	B-1359146

Clicking this link will open a page 'TuBaFrost Order-Tissue Status' which will display ALL orders made to the collectors. Each row resembles the order (made of multiple tissue items). The OrderID is created during order creation.

List of Orders for all Collectors: (Central Office)							
OrderID	Tissue Items				Order made by	Date order made	Days elapsed since order placed
Isab9.8.2005.105156	Number of tissue samples ordered for this collector	Collector Institute	Collector Name	Status of tissue orders for this collector	Martin Isabelle (EORTC) mis@eortc.be	09/08/2005 10:51:56	0
	1	EORTC	EORTC (Martin Isabelle) mis@eortc.be	Decision has been made: ALLOW ORDER-TISSUE request			
Isab3.8.2005.13:28	Number of tissue samples ordered for this collector	Collector Institute	Collector Name	Status of tissue orders for this collector	Martin Isabelle (EORTC) mis@eortc.be	03/08/2005 13:28:47	6
	3	CRO Aviano	CRO Aviano (A Gloghini) agloghini@cro.it	Awaiting response <input type="button" value="Send Reminder"/>			

Clicking this link will open a new window which will display the complete order details (tissue request form) along with a link to the PDF project file and list of tissue items requested.

List of TuBaFrost Tissue Records - Mozilla Firefox							
OrderID:	Isab3.8.2005.13:28						
Date order created:	03/08/2005 13:28:47						
First Name:	Martin						
Last Name:	Isabelle						
Institution Name:	EORTC						
Address:	Avenue E Mounier, 83; Brussels; Belgium						
E-mail:	mis@eortc.be						
Phone Number:	+32 2 774 1033						
Fax Number:	+32 2 774 0000						
Research Project Description and experiments to be performed (250 characters max):	dqsdqsdqsdqsdqsdqdq Project file: errordisplaycoderemovedfrombatchdisplay.txt						
Number of samples necessary to carry out the research proposal:	15						
Local Medical Ethics Commission (MEC) or Multi-centre Research Ethics Committee (MCREC)	Acquired approval? unknown Reference number of approval: 45257425 Address of MEC/MCREC: adresqds Comments of the MEC/MCREC: qsdqsqds						
Additional clinical patient case data or tissue sample data required?	qdqsdq						
Research activities of the requestor:	Publications in the last five years (only the five most important): qdqsdq Most relevant publications related to the project research (only the five most important): sdqsdqsd Summary of the scientific activities: qdqsdq Others: dqsdqsdqs dqsdqsdqs						
Expected benefits derived from investigation:	dqsdqsdqs						
Is there any possibility that the project will lead to a patent application or is it part of a larger project aimed at a patent application?:	no						
Financial support for the project indicating the financing bodies: government, pharmaceutical industry, private funds, others.:	qsdqsdq						
Comments:	qsdqsdq						
List of Tissue items:	<table border="1"> <tr> <td>TF1000B156890</td> <td>Awaiting response</td> </tr> <tr> <td>TF1000B153353</td> <td>Awaiting response</td> </tr> <tr> <td>TF1000B157299</td> <td>Awaiting response</td> </tr> </table>	TF1000B156890	Awaiting response	TF1000B153353	Awaiting response	TF1000B157299	Awaiting response
TF1000B156890	Awaiting response						
TF1000B153353	Awaiting response						
TF1000B157299	Awaiting response						

The last three columns provide details about the order (who made it, when it was made and number of days elapsed since order was made). Within the Tissue item column, there are 4 individual split columns and each row in this main column represents the grouped tissue items for each collector institute involved in the tissue-order.

List of Orders for all Collectors: (Central Office)							
OrderID	Tissue Items				Order made by	Date order made	Days elapsed since order placed
Isab9.8.2005.105156	Number of tissue samples ordered for this collector	Collector Institute	Collector Name	Status of tissue orders for this collector	Martin Isabelle (EORTC) mis@eortc.be	09/08/2005 10:51:56	0
	1	EORTC	EORTC (Martin Isabelle) mis@eortc.be	Decision has been made: ALLOW ORDER-TISSUE request			
Isab3.8.2005.13:28	Number of tissue samples ordered for this collector	Collector Institute	Collector Name	Status of tissue orders for this collector	Martin Isabelle (EORTC) mis@eortc.be	03/08/2005 13:28:47	6
	3	CRO Aviano	CRO Aviano (A Gloghini) agloghini@cro.it	Awaiting response <input type="button" value="Send Reminder"/>			

The central office can create an e-mail to the requestor who made the order by clicking e-mail address click in 'order made by'. The central office can also automatically send a reminder e-mail to the collector institutes who have not responded to the order request by clicking the button "Send Reminder" or they can click the e-mail address link within the 'collector name' column to write a specific e-mail to the collector.

Collectors

As a TuBaFrost Collector, in the Table of Tissues page there will be a link "View Order History (Collector)".

Institution: CRO Aviano	Tissue Database for I		
User: Antonino Carbone	Order (descending) by		
Create New Tissue Record	Group by Local Patient		
Upload database record data			
View Order History [Collector]	Local Inventory Tissue Code	Local Patient Case Code	Sit (to
Logout	B115837	B115837	S

Clicking this link will open a page 'TuBaFrost Order-Tissue Status' which will display orders made to his/her institute. Each row resembles the order (made of multiple tissue items). The OrderID is created during order creation. Clicking this link will open a new window (see central office section) which will display the complete order details (tissue request form) along with a link to the PDF project file and list of tissue items requested.

List of Requested Orders for Collector: CRO Aviano							
OrderID	Tissue Items				Order made by	Date order made	Days elapsed since order placed
Isab3.8.2005.13:28	Number of tissue samples ordered for this collector	Collector Institute	Collector Name	Status of tissue orders for this collector	Martin Isabelle (EORTC) mis@eortc.be	03/08/2005 13:28:47	5
	3	CRO Aviano	CRO Aviano	Awaiting response <input type="button" value="ALLOW"/> <input type="button" value="DENY"/>			

The collector can create an e-mail to the requestor who made the order by clicking e-mail address click in 'order made by'. When the order is first created the status is: 'awaiting response' which means that the collector must decide whether he/she wishes these tissue items in this order to be used for the research project. If the user clicks 'ALLOW', it will ask for a confirmation and then will set this order (group of tissue items) to 'Allowed'

Collector Name	Status of tissue orders for this collector
CRO Aviano	Decision has been made: ALLOW ORDER-TISSUE request

If the collector clicks 'DENY', the system will ask for a confirmation and then the collector must complete a field with the reason why the order was denied and collector clicks 'submit reason' and the order will be set to 'Denied'

Reason for Order Denial

18:13:34 PM

Monday 8/8/2005

The tissue request has been denied, because the suggested research was considered not to be of the standard needed to issue the for us valuable requested samples. Especially, because you requested large volumes of sample instead of reuesting part of the requested sample. Terminating a sample for an experiment, results in high expectations for that experiment. In addition, we have a research group working on that particular tissue type, resulting in even higher expectations. I am sorry I have to deny your request and wish you success in your further request attempts at other institutes.

With kind regards,

Peter Riegman,
Erasmus MC Tissue Bank Manager

Number of tissue samples ordered for this collector	Collector Institute	Collector Name	Status of tissue orders for this collector	Martin Isabelle (EORTC) mis@eortc.be
3	CRO Aviano	CRO Aviano	Decision has been made: DENY ORDER-TISSUE request Reason for denial: Tissues are being used for research project within hospital	

Requestors

The requestor can also view the status of his/her orders by logging into the search engine section.

Once logged in, there will be a link 'View Order History'

[Search](#)

[Log Out](#)

[View Shopping Cart](#)

[View Order History](#)

Search-Parameters:

ALL ANY

(ALL = system will search the database for tissue records matching all sear
 ANY=system will search the database for tissue records where at least one

Clicking this link will open a new window displaying all the orders made by him/her.

List of Orders for Requestor: Martin Isabelle						
OrderID	Tissue Items				Date order made	Days elapsed since order placed
Isab9.8.2005.105156	Number of tissue samples ordered for this collector	Collector Institute	Collector Name	Status of tissue orders for this collector	09/08/2005 10:51:56	0
	1	EORTC	EORTC (Martin Isabelle) mis@eortc.be	Decision has been made: ALLOW ORDER-TISSUE request		
Isab3.8.2005.13:28	Number of tissue samples ordered for this collector	Collector Institute	Collector Name	Status of tissue orders for this collector	03/08/2005 13:28:47	6
	3	CRO Aviano	CRO Aviano (A Gloghini) agloghini@cro.it	Awaiting response		

Each row resembles the order (made of multiple tissue items). The OrderID is created during order creation. Clicking this link will open a new window (see central office section), which will display the complete order details (tissue request form) along with a link to the PDF project file and list of tissue items requested.

The requestor is able to communicate directly with the collectors by clicking the e-mail address in the 'collector name' column.

For orders that have been allowed by the collector, it is now their responsibility to organize the material transfer form (MTF) and the transfer of the tissue items with the requestor (see deliverable 6.2 - 'Policy and rules for monitoring and use of banked tissues in research').

Summary

As collectors use the central database to enter their locally collected and stored frozen tissue samples, more and more data and material will become available to the scientific community via the search engine and tissue request system. Once registered, the scientific community (or requestors) can use the online search engine to enter their search parameters corresponding to the needs of their research projects.

From the results, they can view the tissue and patient information and images to assess whether the tissue items do match their requirements and then add to a tissue-shopping cart. Once this tissue-shopping cart is full of tissue items, the requestors can go the 'check-out' and complete a tissue request form which will provide the information to the collectors about the research project in order to make their decision about allowing access to the tissue items as well as the necessary information to the TuBaFrost Central Office. The requestors can access the status of their orders at any time and contact the central office if there are problems.

The tissue-order management page also allows the collectors to respond to the tissue requests and provide reasons for their decisions and provides a channel of communication between them and the requestors.

Through the management page, the Central Office can automatically or manually send reminders to collectors if they have not responded to the order request after one month.

Appendix A - Technical manual for TuBaFrost Central Database

Database Structure

TuBaFrostInstitutions (Collector Institutes):

Data Type	
AutoNumber	InstitutionuniqueID
Text	Institution Name
Number	Tubafrost Inventory code prefix

Users (Collectors):

Data Type	
Text	Id of User
Text	User's Login
Text	FirstName
Text	LastName
Text	E-mail address
Text	Phone Number
Text	Password
Text	Reason for Registration
Number	Level of Access to Member Only Section
Number	Number of visits to website
Text	InstitutionName
Text	StreetName and number
Text	Box
Text	Zip Code / Post Code
Text	Town
Text	City
Text	Country
Text	Fax
Text	Title
Number	TuBaFrostInstitutionNo

PatCaseData (Patient Case Data):

Data Type		Desc
AutoNumber	PatientID	
Text	Local Patient Code	
Text	Histopathological Diagnosis 1 (morphology)	
Text	Histopathological Diagnosis 2	
Text	Histopathological Diagnosis 3	
Text	Stage (and TNM)	
Text	Grade	
Text	Age at time of biopsy/sampling (years)	
Text	Gender/Sex	
Text	Involved in clinical trial (yes/no); if yes: trial and patient reference	
Text	Medical History/Treatment/Complications/Toxicity/Concomitant disease	
Text	Comments	
Number	Link to TuBaFrostInstitutions	

TissSamData (Tissue Sample Data):

Data Type	
AutoNumber	TissueID
Text	Local inventory Tissue Code
Text	Site of tumor/topography
Text	Tissue condition
Text	Time (in hours and mins) elapsed after biopsy was
Text	Availability of tissue sample
Text	Comment
Number	Link to Patient table
Number	Link to Institution table

TFTrackPatient (Patient Case Record Tracking):

Data Type	
AutoNumber	PatientTrackID
Number	Link to Patient table
Text	Date patient record entered into Central Database
Text	Date patient record last updated

TFTrackTissues (Tissue Sample Record Tracking):

Data Type	
AutoNumber	TissueTrackID
Number	Link to Tissue table
Text	Date Tissue record entered into Central Database
Text	Date Tissue record last updated

ReplImages (Representative Image data):

Data Type	
AutoNumber	RepImageID
Number	Link to Tissue Table
Text	Image file Name
Text	Location of Image on server
Text	Image Comment

Virtualimages (Virtual Image data):

Data Type	
AutoNumber	VirtualImageID
Number	Link to Tissue Table
Text	Image filename
Text	Web server location of full virtual slide file VS
Text	Web server location of thumb nail file

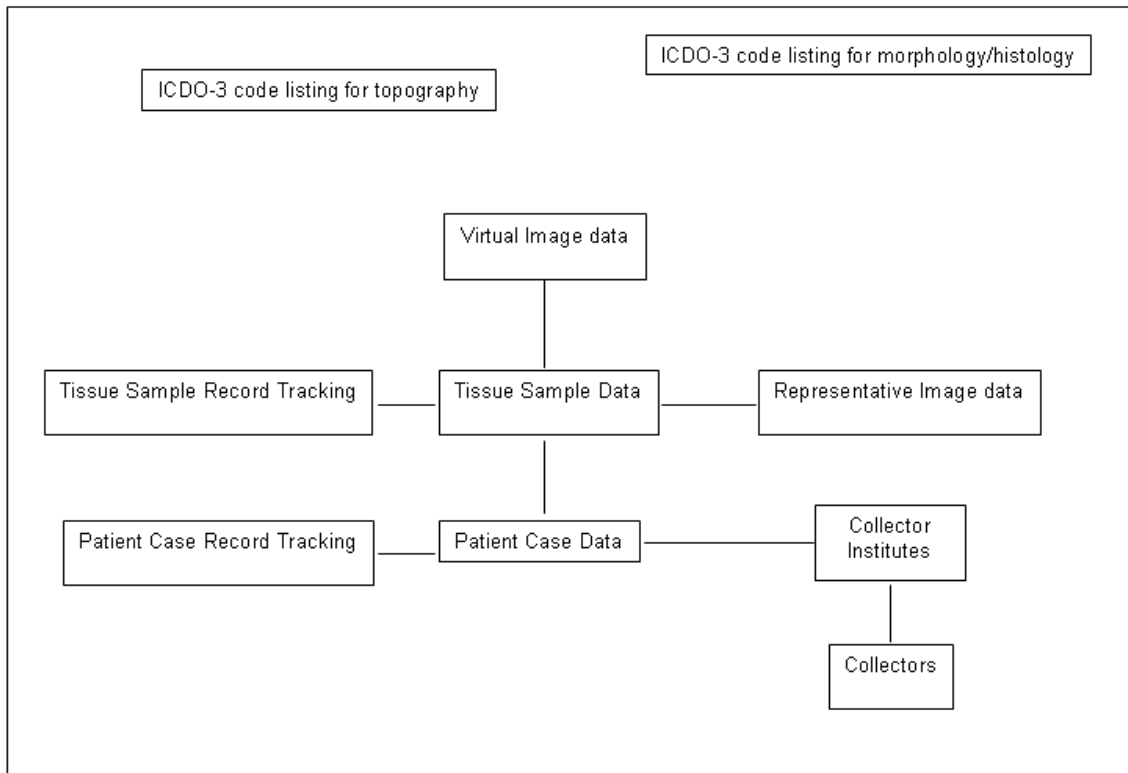
SiteTopICDO3 (ICDO-3 code listing for topography):

Data Type	
AutoNumber	SiteICDO3ID
Text	Site ICDO-3 code
Text	Site ICDO-3 code description

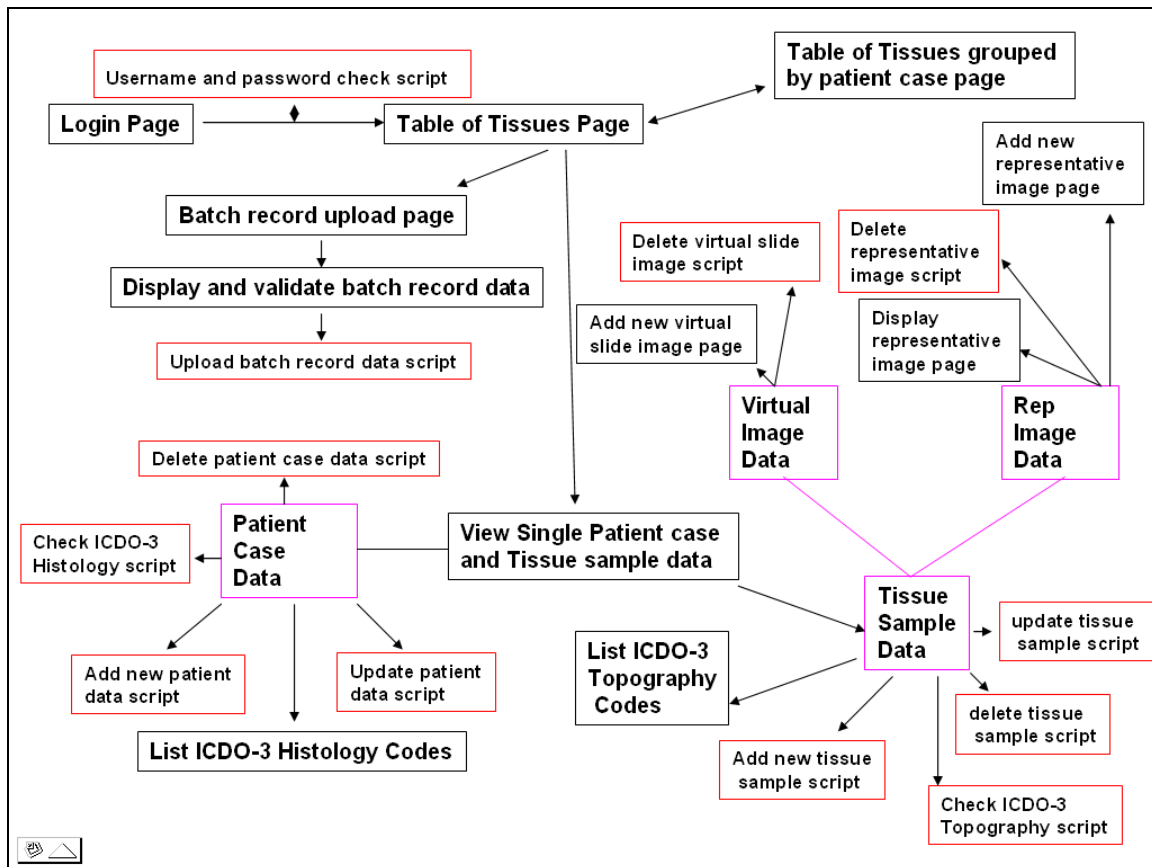
HisMorICDO3 (ICDO-3 code listing for morphology/histology):

Data Type	
AutoNumber	HisICDOCodeID
Text	Histology ICDO-3 Code
Text	Histology ICDO-3 Code Description

Database relationships



Web Page Flow Diagram



Web Site Description

Login Page and Login Verification:

- Form to enter username and password
- Submit -> posts username and password entry to username and password verification script which opens the database and checks that a record exists in Users (Collectors) table with matching username and password
- If no record exists then user returned to login page
- If record exists:
 - Session variables set (login, full name, institute, access level)
 - Users moves to Table of Tissues Page

Table of Tissues Page:

- ¹Verifies that a session username exists (i.e. user has logged in correctly and session has not timed out)
 - If no session username exists redirect to login page with error message:
 - If session username exists continue with code....
- Opens database and for each tissue record (in the user's institute) in Tissue Sample data table a new row is created in a table. Corresponding patient case data is also collected from Patient Case Data table. Each tissue record row will have a link to 'View Single Patient case and Tissue sample data' page with TissueID and PatientID
- Select box created above table to select display order (by date entered, topography, histology, age.....) which reloads page with 'order by ****' in sql query.
- Web links are created for:
 - Create new single patient case or tissue sample data (-> View single patient case and tissue sample data page with new patient)
 - Upload batch record data (->Batch record upload page)
 - Log out (->return to login page)

Group by Local Patient Code

- Similar to Table of Tissues Page code however first column in table is: Local Patient Case Code where each group (patient) is displayed in alternating row colors. Records are ordered by Local Patient Case Code only
- Link to display Table of Tissues Page ungrouped

Single Patient and Tissue Record Entry

- Opens database and patient case table and creates a select box with Patient Case Code displayed that the user can select. There is also a select option for new patient.
- When the user selects to create a new patient:
 - an empty patient case form will be displayed for the user to complete
- When the user selects an existing patient from the list:
 - A patient case form will be displayed but with the data displayed in the boxes which can be alternated.
- In both modes it is possible to select an ICDO-3 histology code/description from a drop down list (selected from ICDO-3 histology code table) or user can enter or change text in histology field and click 'check ICDO-3 histology code' which will check with the histology entry in the form exists in the ICDO-3 histology code table in the database.
 - If so an alert message is displayed with match and the ICDO-3 is entered into the field
 - If not, an alert is displayed informing user of no match and the field entry is unchanged

¹ This login/session verification script will be installed on all pages.

- Once the data has been entered or updated, they click 'Save Case Data' or 'Update Case Data'. The form is validated using the javascript code (e.g. required form fields are not empty or unselected and only numbers are used in age field).
- If new patient data, the form is posted to add new patient case script where a new record is created in Patient Case data table and the form data is entered into the relevant fields. A new record is also created in Patient Case Record Tracking table and new PatientID and current date is entered. An e-mail is created and sent to the Database administrator with a copy of the form values.
- If already existing patient data, the form is posted to 'update patient data script' where the record with matching PatientID in the Patient Case Record table is updated. The record with matching PatientID is updated in the Patient Case Record Tracking table with current data. An e-mail is created and sent to the Database Administrator with a copy of the new updated form values.
- The user can delete a patient case record (and all associated tissue and image data) by clicking 'delete patient case record, tissues and images'. A warning is displayed first which the user must confirm action. Once clicked the delete patient case data script is run which deletes the patient case record with matching PatientID from Patient Case Record table; deletes all image record data with matching TissueIDs from Representative Image table and Virtual Slide image table; deletes all tissue records with matching PatientID from Tissue Sample Record table; updated Patient Case Record Tracking and Tissue Sample Tracking tables with current date.
- Display Tissue Sample data and Images
 - By selecting an already existing patient or submitting a new patient case record, the existing tissue sample data (taken from Tissue Sample Record table with matching PatientID) for the patient is displayed in a table below the patient case data along with any representative image and virtual slide images (taken from Image tables-see below). Also an empty tissue sample form is displayed to be completed for a new tissue sample record
 - The representative images and virtual slides images are displayed as thumbnails within the bottom of each column of the tissue sample data (so each column is a tissue record).
 - Representative images
 - Clicking this thumbnail image opens the display representative image page which displays the image at 600x600 and user can resize this image resolution clicking zoom in or zoom out or by entering new resolution value.
 - Clicking 'Add new Image' opens the add new representative image page where the user can select a file from his hard drive and enter an image comment into a form. The selected image is previewed on the page. Click upload runs the add

new rep image script which uses aspSmartUpload to pick and store the image file on the image server into a directory and then creates a new record in the Representative Image table with image name, comments, TissueID, PatientID and location on the image server. If invalid file type or no image file selected the user is redirected back to the add image upload page with error message.

- Virtual Slide Images
 - Clicking the thumbnail image opens the virtual slide http viewer (supplied by Hamamatsu Photonics) which opens the matching VMS image file (using the VirtualImageID) stored on the image server. The window allows the user to change the magnification and position of the virtual slide image.
 - Clicking 'Add New Virtual Slide Image link' opens the add virtual slide image page where the EORTC Tissue Bank Administrator can enter the http image server thumbnail image location and http image server virtual image location into the form. Click submit opens the 'add virtual slide image' script which creates a new record in the Virtual Slide Image table with TissueID, PatientID, thumbnail and image server locations.
- Enter new tissue sample data or update existing tissue sample data
 - Enter new tissue sample
 - When user has entered new patient case data or selected existing patient case record a form will be displayed in the Tissue data section for the user to complete.
 - In both modes (enter and update) it is possible to select an ICDO-3 topography code/description from a drop down list (selected from ICDO-3 topography code table) or user can enter or change text in topography/site of tumor field and click 'check ICDO-3 topography code' which will check with the topography entry in the form exists in the ICDO-3 topography code table in the database.
 - If so an alert message is displayed with match and the ICDO-3 description is entered into the field
 - If not, an alert is displayed informing user of no match and the field entry is unchanged
 - Once the new tissue data has been entered into the form, the user clicks 'Submit Tissue Data' and the add new tissue data script is run which validates the form data and then creates a new record in Tissue Sample Data (checking tissue sample record does not already exist->if so error message) from the posted form data.
 - An e-mail is sent to database administrator that a new tissue record has been entered by user listing the form values.

- A new record is created in Tissue Sample Record Tracking table with TissueID and current date.
 - Update Tissue Sample record
 - The user can select a tissue record from the Table of Tissues Page which will collect the data from the Tissue Sample Record table with matching TissueID and PatientID. This data is entered automatically into the tissue form.
 - The user can then modify the details in the form (changed text turns red) and clicks 'Update Tissue Record' which runs the update tissue record script that:
 - Validates form data
 - Opens and updates the Tissue sample record in the Tissue Sample record table with the matching TissueID and PatientID
 - Opens and updates the record in the Tissue Sample record tracking table with matching TissueID and updates with current date for data last updated.
 - An e-mail is created and sent to the Database Administrator with a copy of the new updated tissue sample form values.

Batch data upload

- Entering or updating tissue records using batch upload
 - Click the link: 'Upload database record data' from the table of tissues page will open the Batch upload page.
 - On this page, the user will be presented with a form to select and upload a text file and a link to download an excel template document.
 - This excel template contains the column setup and headers required for the user to copy and paste their database data into. Or they can use this template to setup their own tissue extraction query in their database.
 - Once the data has been copied or extracted in the correct order the user will save the data as a tab-delimited text file (*.txt) which creates a copy of the database where each record (row) is separated by a linefeed or vbLf/vbCrLf and each field or column is separated by a tab or vbTab. Since this tab-delimited text file format is a universal file type used by most databases and the system can use these linefeed and tab separations to identify the different fields and records, this is the best format for a universal central database.
 - Now that the tab-delimited text file has been created, the user will click 'browse' to select the file from this hard drive and click upload which will run the display batch data script:
 - Will use mySmartUpload to upload the tab-delimited text file to a directory on the server (i.e. /TextFiles/). The filename will be set to: username_HourMinuteSeconds_originalfilename.txt.
 - Will open the text file (objFSO.OpenTextFile):
 - Checks correct template (i.e. order of columns) is used and column headings exist
 - Check there is at least one record in the file

- Separate records by linefeed (vbCrLf/vbCr/vbLf) and perform checks on data:
 - Local patient case code exists for each record
 - Age exists for each record and contains only numbers
 - Local inventory tissue code exists for each record
 - Gender exists for each record
 - Availability of tissue exists for each record
- If any of these errors are encountered, they are added to an array noting record number and field and type of error
- Creates a table and for each record:
 - Increments n by 1
 - Defines and allocates a variable for each field value and adds the n value (so record1, record2.....)
 - Creates a row and displays each value under its column heading within an input and select field
 - If an error is detected the field value is highlighted red and must be corrected (before data can be submitted)
 - There is an ICD-O link check for all diagnoses and topography which like above describes checks the values automatically.
- When the user clicks 'Validate Form Data' the system will first run a javascript to check all errors have been corrected.
 - If error still found - a pop window will inform the user of the error and which record and will focus on the record.
 - Once all errors have been found and corrected the form table data will run the add batch record to database script:
 - Number of patient records entered, Number of patient records updated, number of tissue records entered, number of tissue records updated set to 0
 - Opens the database reads the posted n value and creates a for...next loop for each record which:
 - Checks whether the local patient case code of the record exists in Patient Case Data table:
 - If already patient case code already exists:
 - The record with matching Local Patient Case Code is updated with new values
 - Record in Patient Case Record tracking table

- matching PatientID is updated with current date
 - Number of patient records updated incremented by one
 - If patient case code does not exist already
 - New patient record created in Patient Case Record table from form data
 - New record created in Patient Case Record table from field data.
 - Number of patient records entered incremented by 1
- Checks whether the local inventory tissue code of the record exists in Tissue Sample record table already
 - If already local inventory tissue code already exists:
 - Tissue record in Tissue Sample Record table with matching Local Inventory tissue code updated with new field data
 - Record in Tissue Sample tracking table with matching TissueID updated (date last updated) with current date
 - Number of tissue records updated incremented by 1
 - If local inventory code does not exist already
 - New tissue record created in Tissue Sample record table from field data
 - New record created in Tissue sample tracking table with TissueID and current date
 - Number of tissue records entered incremented by 1

- Once each record/line has been processed and upload success message is set.
- E-mail created and sent to Database Administrator informing him/her user has entered or updated X number of patient and tissue records.
- User redirected back to batch upload page.

Search Engine and Tissue Request System

Additional Tables used by Search Engine and Tissue-Order Request System:

Requestors:

RequestorID (autonumber)
 Requestor Name (text)
 Requestor Institute (text)
 Requestor Address (text)
 Requestor e-mail address
 Requestor phonenumber
 Requestor Username
 Requestor Password

Shopping Cart:

ShoppingCartID (text: requestorID_currentdateandtime)
 TissueIDs (text)
 RequestorID (number)
 Date (date)
 Time (number)

Orders:

OrderID (text: requestorID_currentdateandtime)
 RequestorID (number)
 DateofOrder (date)
 Project Description (text)
 Project pdf file location (text)
 Number of samples necessary to carry out the research proposal (number)
 Local Medical Ethics Commission (MEC) or Multi-centre Research Ethics Committee (MCREC) approval number, address and comments (text)
 Additional clinical patient case data or tissue sample data required (text)
 Research activities of the requestor (text)
 Expected benefits derived from investigation (text)
 Financial support for the project (text)
 Comments (text)

Order-Tissue:

OrderID (text)

TissueID (number)

Status of Tissue-Order (Awaiting response; ALLOW tissue request; DENY tissue request)

CollectorID (number)

Order-Decision

OrderID (text)

Decision (text)

Comment (text)

CollectorID (number)

RequestorID (number)

Registration Page

- This page will allow someone to enter their details (full name, institute, address etc..) into a form. This data is e-mailed to the database administrator who will be responsible for enter the user into the 'requestors' table

Forgotten username/password page

- If a registered user has forgotten either of both their username and password they will enter their e-mail address (submitted at registration) into a form and when submitted the system will open the 'requestors' table check for the matching e-mail address and if found will send the username and password to the user's e-mail account.

Login Page

- The user will enter their username and password to enter the search engine system. When submitted the system will check that matching username and password exists in 'requestor' table and if found will open the search parameter page and set session variables (full name, requestorID etc...). If no record found matching username and password user returned to login page with error message

Search Parameter Page

- Left column displays links to:
 - Reset search parameters (new search)
 - View shopping cart
 - View Order History
 - Log Out
- Page will display a form with fields for:
 - All or Any match (radio button)
 - Keywords (text)
 - Topography (text field and ICDO-3 list/check)
 - Tissue Condition (select)
 - Morphology/histology/diagnosis (text field and ICDO-3 list/check)
 - Stage (text)
 - Grade (text)
 - Age (select for age range)

- Sex/gender (select)
- Medical History (text)
- Other (text)
- Institutes (check boxes to select/deselect collector institutes in search)
- The user will select the parameters for their search by entering text, selecting options or checking/unchecking boxes.
 - For topography and histology search fields, like the central database, there will be a button for 'list ICDO-3 codes' and button for 'check entry for ICDO-3'. The user can select histology or topography from the ICDO-3 list (script will select ICDO-3 from relevant table and list them all as options for user to select which is then automatically entered into the form field) or enter text and check ICDO-3 tables for matching codes. See above for more explanation.
 - The institutes are displayed by the system selecting all records from the 'collector institutes' table and displaying them as checkboxes to be selected or deselected.
- The user will then submit their search parameters and the system will run the search script and display in results page

Result Page

- Left column displays links to:
 - Reset search parameters (new search)
 - View shopping cart
 - View Order History
 - Log Out
- Two methods of search depending on whether ALL or Any match was selected in search parameters and whether a keyword was entered
- Any
 - The system will check the Patient Case Record table and Tissue Sample Table (limited fields for search) using do while...loop to see whether one of the criteria match:
 - E.g. Histopathological diagnosis = histology text field or sex=sex/gender select field
 - E.g. gender, grade.etc..... = keyword field
 - E.g. Histology = melanoma or age=45-50 or topography=breast
 - If there is any match the result is entered into a row into a table with a link to the 'View Patient case and Tissue sample data page' using TissueID and PatientID
 - If there is no match 'no result' message displayed
- All
 - The system will check the Patient Case Record table and Tissue Sample Table (limited field for search) to see whether ALL search parameters match for a tissue or patient record using do while...loop
 - E.g. Gender=male and histology=melanoma and topography=skin.....

- If there is any match the result is entered into a row into a table with a link to the 'View Patient case and Tissue sample data page' using TissueID and PatientID
- If there is no match 'no result' message displayed
- Below the result table is the search form with the submitted parameters automatically entered in (request.form vbscript) which the user can modify and resubmit again which will post the new parameters to the search script.

View Patient case and Tissue sample data page

- This page displays the patient case, tissue samples and images for the selected Patient and Tissue.
- Some items will not be displayed (Local Patient Code, involved in clinical trial, local inventory tissue code, availability of tissue)
- For each tissue item, there is a link: 'Add to shopping cart'. If the user clicks this, the system will run a script which will create a new record in Shopping Cart Table with ShoppingCartID (created for session requestorID and current data and time) and TissueID. A system will display the Shopping Cart Page to the user

Shopping Cart Page

- This page will open the shopping cart record from the Shopping Cart table created today for the session RequestorID and will display the tissue items chosen
- The user can delete particular tissue items which will run the script to delete the record with matching ShoppingCartID and session RequestorID from the Shopping Cart table.
- The user can empty the shopping cart of all items which will run the script to delete all records with session RequestorID from the Shopping Cart table.
- Continue shopping and close the shopping cart window (self.close Javascript)
- Go to checkout (->Tissue-order request page)

Tissue-order Request Page

- Here the user will be presented with a list of the tissue items he/she wishes to request for their project
- Form will display user details (address, instit, phone number...) automatically taken from Requestors table using session RequestorID
- Tool to upload research project pdf file onto server
- Additional field:
 - Brief description of research project
 - Ethical and scientific committee approval number.....
 - Etc... (see main section)
- Once all the required fields are completed the user will submit the request
 - Will create a record in Orders table with information from the tissue request form (OrderID, date of order, project details, ethics commission details, research activities, financial support...)
 - Create records in Order-Tissue table for each tissue item involved in the order (OrderID, TissueID, Status of order (=awaiting response))

- Create record in Order-Decision (OrderID, CollectorID, RequestorID, Decision (=awaiting response))
- Generate an e-mail to Database Administrator listing orderID and all tissue items (with local inventory tissue codes) within the order
- Generate an e-mail to each collector user which entered a tissue item from a tissue item within the order (with local inventory tissue codes)
 - Brief description of research project
 - Web link to pdf file research project
 - Access to tissue request form
 - Asking him to approve or decline use of tissue item(s) for project
 - Contact details (name, e-mail address) for requestor in order to contact for more details
- Delete all records with session RequestorID from the Shopping Cart table.

Order Management Page

a) TuBaFrost Central Office (link in Tissue Table page) - this page will open the orders table and display on the page the orders (as rows) created by all requestors as well as a link to the tissue request form (opens in new window) and list of tissue items (taken from table order-tissue and orders) and the status of the orders. The central office can click a button for each collector to send an e-mail reminder to take some action.

In addition, there will be a link to open the page for registration of requestors, collectors and members of the TuBaFrost central office. This page will give a listing of registered persons with their function and offer edit capabilities of the records present in the list as well as removal or addition operations.

b) TuBaFrost Collectors (link in Tissue Table page) - this page will open the orders table and display on the page the orders (as rows) created by requestors where the collector has tissue items in the order request. They can open a link to view the tissue request and list of items.

The system will also check the status of the orders (from the orders, order-tissue and order-decision tables) and if no decision (order-decision table) has been made regarding the tissue order it will display two buttons: - 'ALLOW tissue order' or 'DENY tissue order'. Clicking either of these buttons will ask the collector for confirmation of the decision.

If the ALLOW button was pushed the system will update the status of the tissue-order of the order-tissue table with 'allowed tissue request' for all TissueIDs with CollectorID matching the collector. It will also update the decision in the order-decision table to 'Allowed tissue request'. An e-mail will then be sent to the requestor automatically informing him/her of the decision.

If the DENY button was pushed the system will open a new page for the collector to complete the reason for denial of the tissue-order. Once this is submitted the system will update the status of the tissue-order of the order-tissue table with 'denied tissue request' for all TissueIDs with CollectorID matching the collector. It will also update the decision in the order-decision table to 'Denied tissue request' along with the reason of the denial

decision in the comment field. An e-mail will then be sent to the requestor automatically informing him/her of the decision.

c) TuBaFrost Requestors (link in search parameter page) - this page will open the orders table and display on the page the orders (as rows) created by the requestor as well as a link to the tissue request form (opens in new window) and list of tissue items (taken from table order-tissue and orders) and the status of the orders. The requestor can send an e-mail to the collectors by clicking the e-mail link.