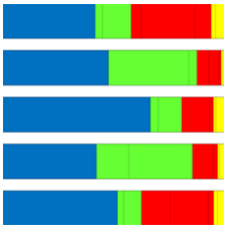

Explicet Advanced Tutorial: Create New Metadata within Explicet

"Explicet" is from the Latin: explain, unfold, extend, set forth, exhibit, disentangle

A brief introduction to program capabilities and functions for new users of the Explicet software

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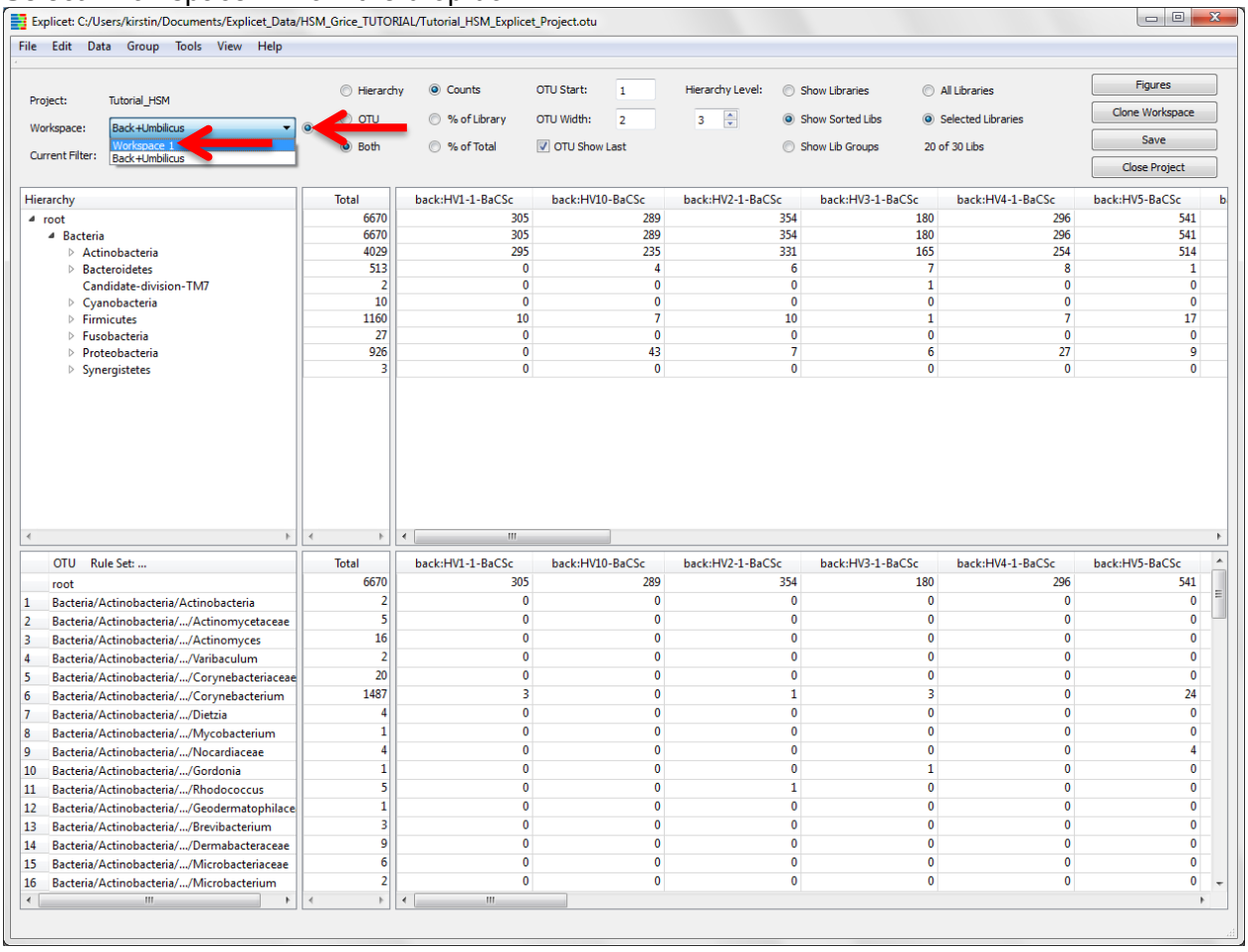
The data used in this tutorial come from an analysis of 16*S* ribosomal RNA gene sequences obtained from many distinct skin sites of healthy humans (Grice EA, *et al.* (2009) Topographical and Temporal Diversity of the Human Skin Microbiome. *Science* 324(5931): 1190–1192). For the purposes of this tutorial, we will create mock metadata. Therefore, the following metadata that we will create is completely artificial and does not represent the findings of the original study.

I. Create New Metadata within Explicet

Instead of importing metadata from an outside source, the user can create new metadata within Explicet. To begin, open the Tutorial_HSM project (created in the basic tutorial) by simply double-clicking on the project file.

Go to “Workspace 1”by clicking the radio button next to the **Workspace** field
Select “Workspace 1” from the drop down



A. Open the Existing Metadata

Data → Metadata
A window with three sections will open

- The left pane: **Defined Metadata**, the right pane: **Assigned Metadata**, the bottom area: **Metadata Definition**. The bottom section, **Metadata Definition**, allows creation of new metadata fields.

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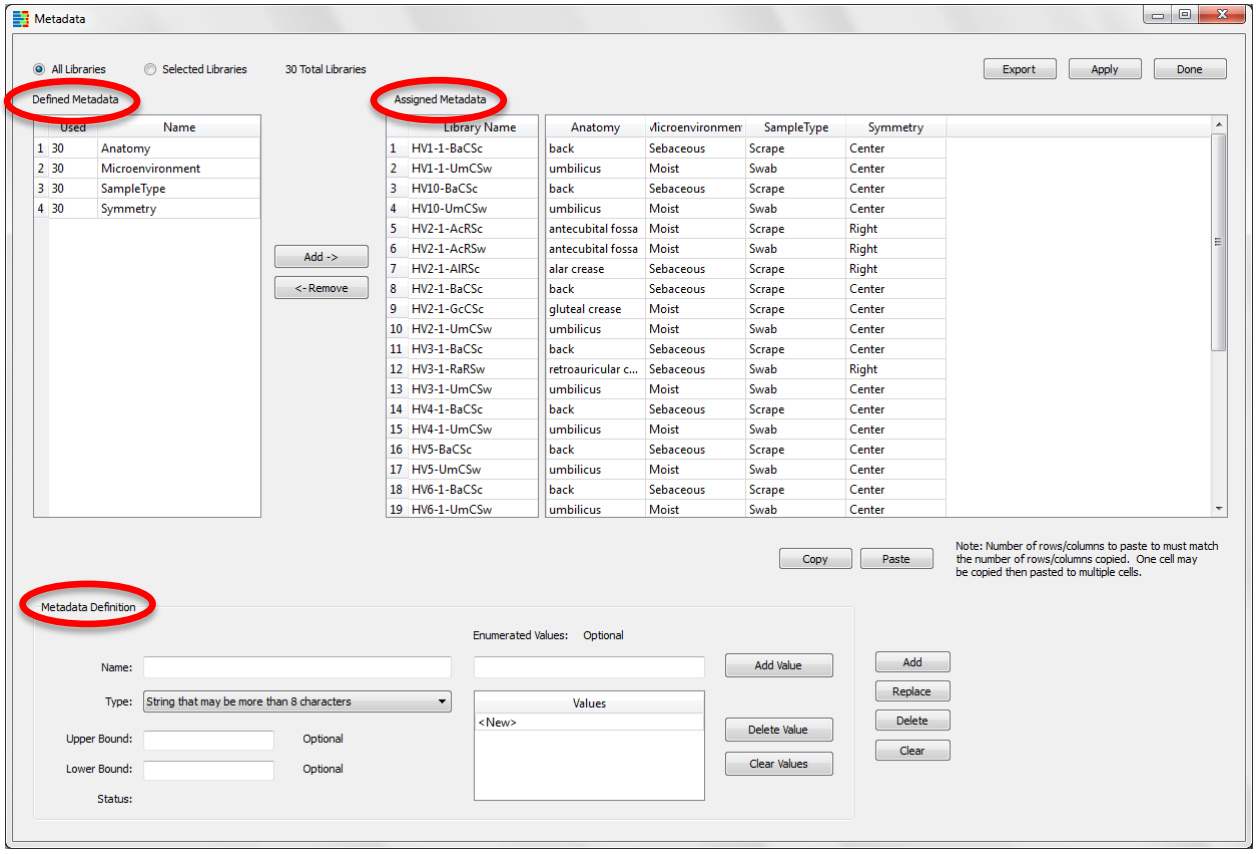

Now we will create a new metadata category and assign a value to each library.

B. Create Enumerated Metadata that is 8 characters or less

For this example, we will create a new metadata category of “Sex”, and we will assign each library as derived from either a “Male” or a “Female”. Since there are only a couple, distinct metadata values for the new definition, we will enter them as enumerated.

Type “Sex” into **Name** field
In **Type** drop-down, choose **String that is 8 characters or less** (words or strings of text 8 characters or less)
Enter “Female” under **Enumerated Values**
Click **Add Value**

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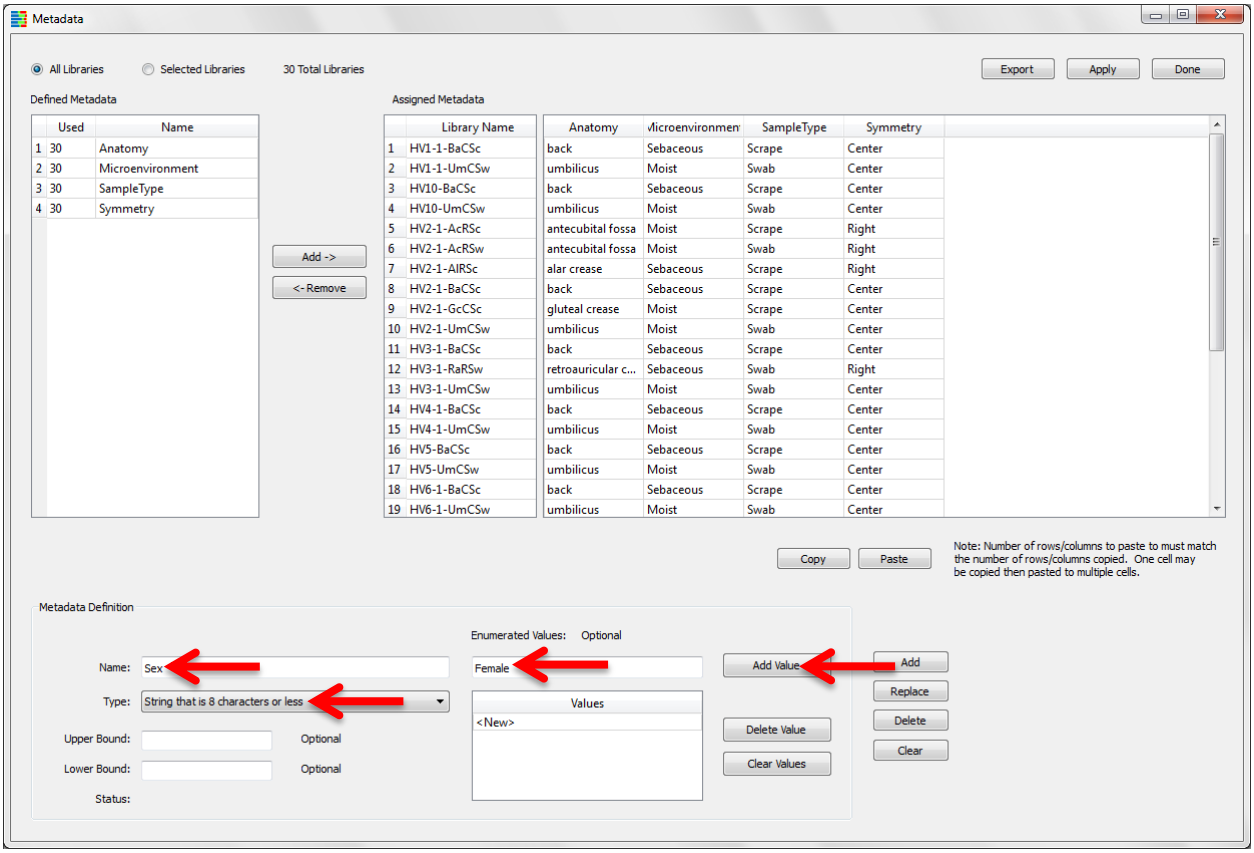
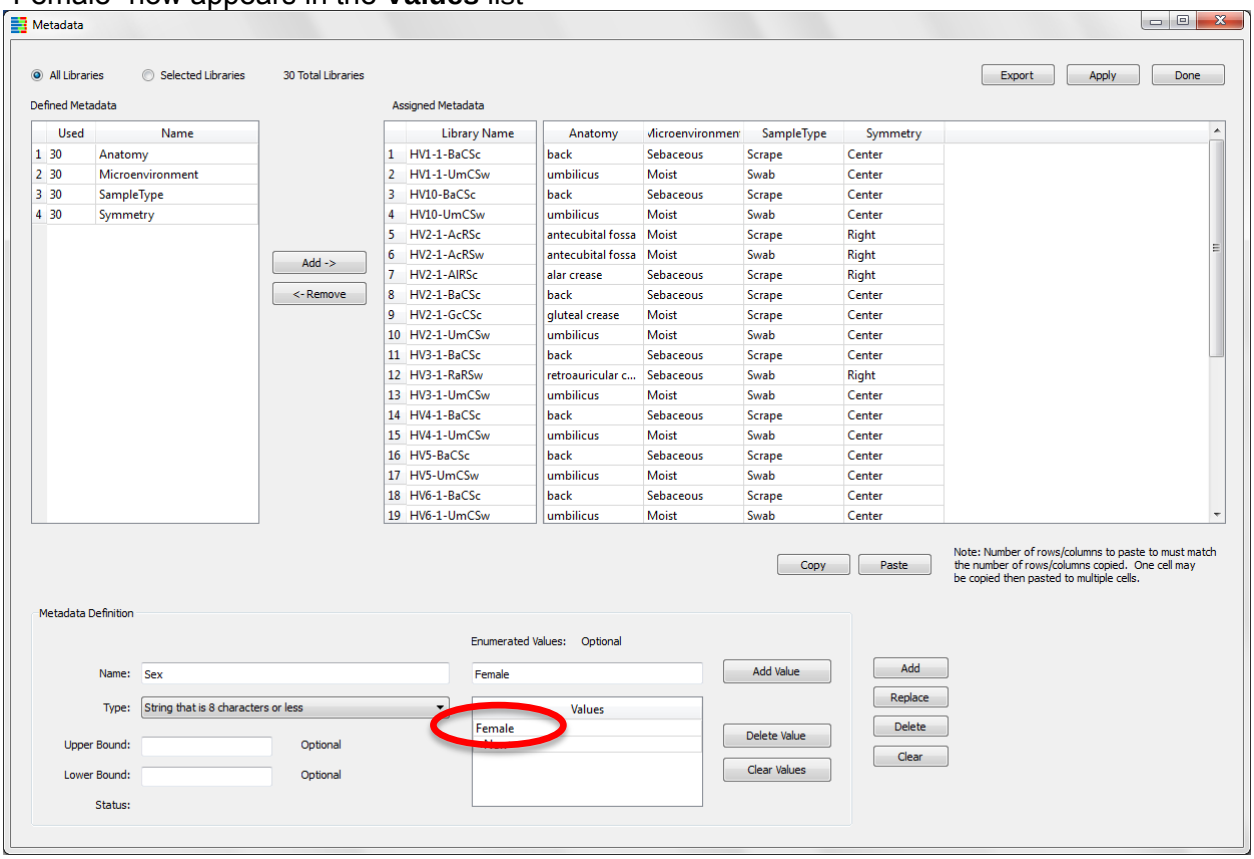


"Female" now appears in the **Values** list



Enter "Male" under **Enumerated Values**
Click **Add Value**

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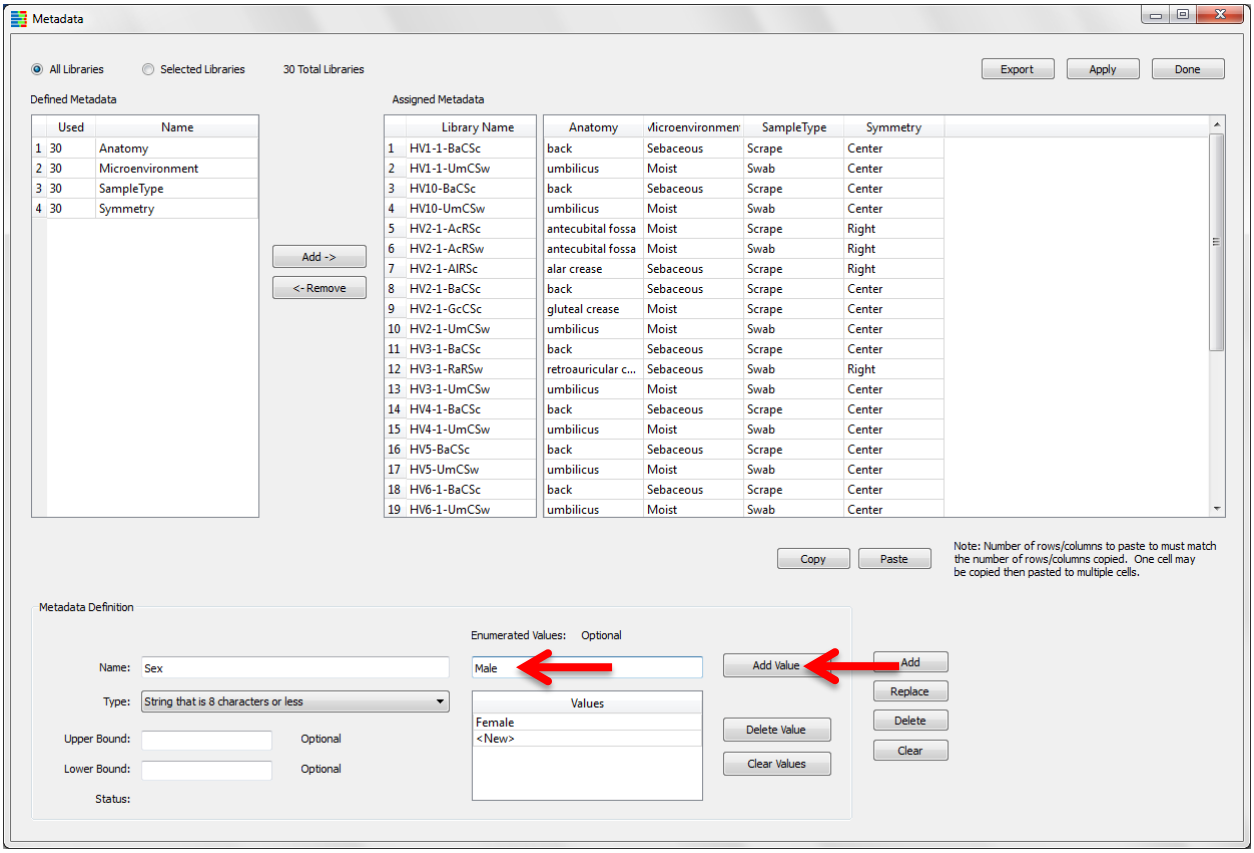
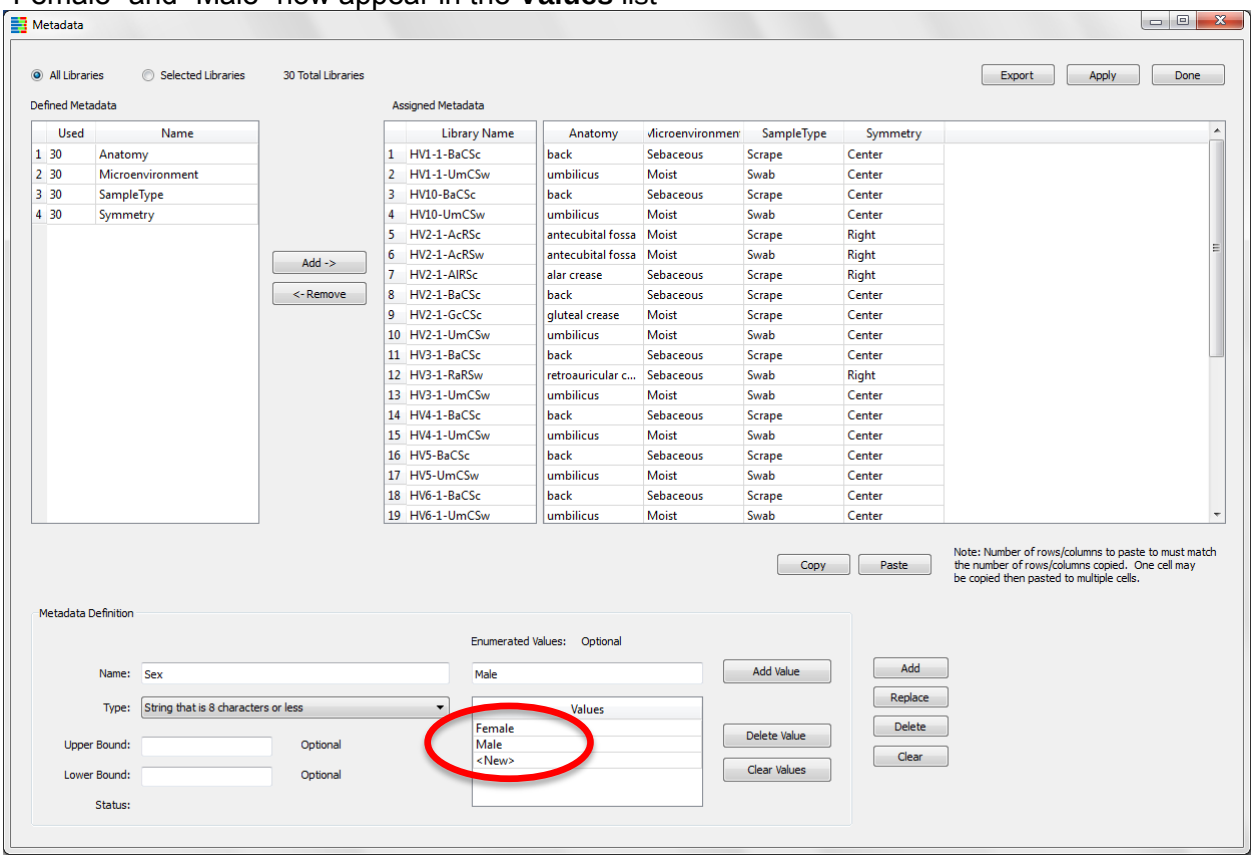


"Female" and "Male" now appear in the **Values** list



Click **Add** button to the right of the **Metadata Definition** section to add "Sex" to the **Defined Metadata** list

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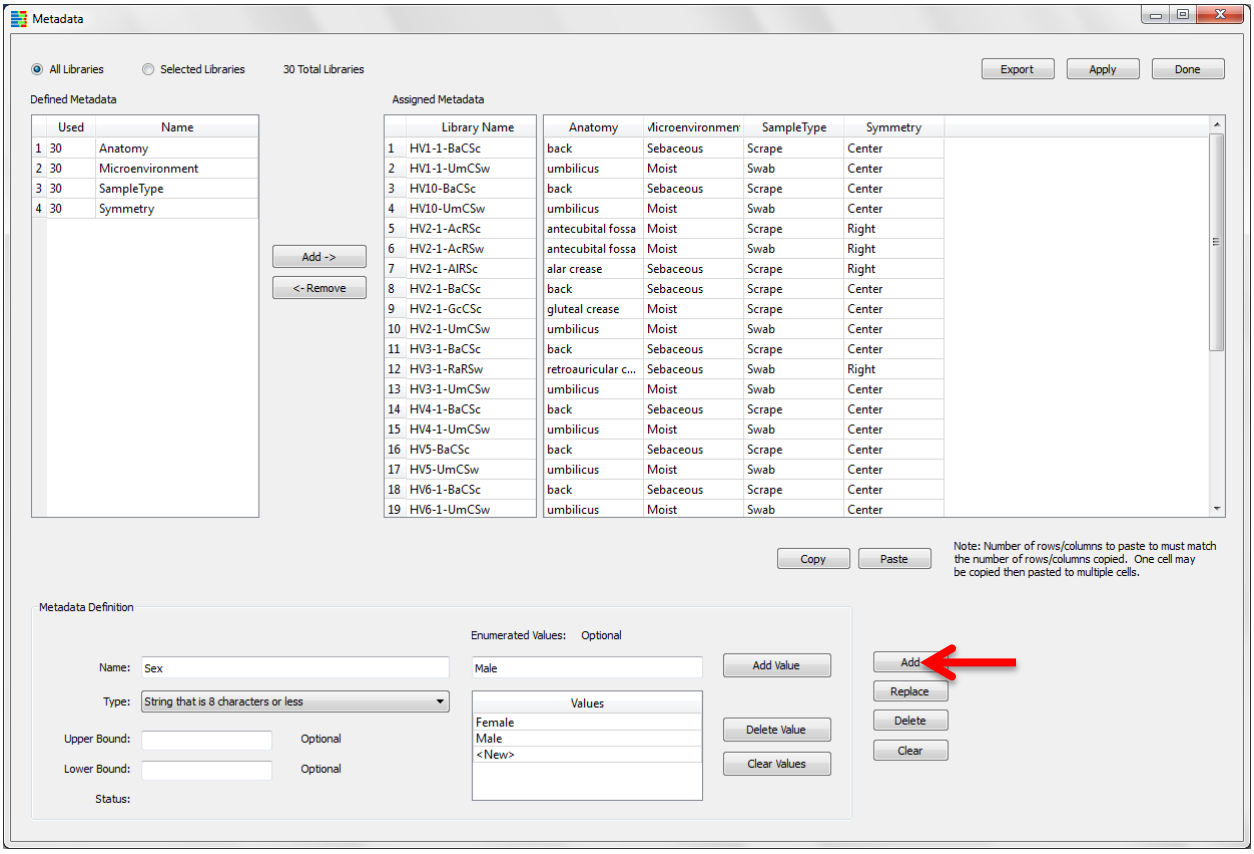
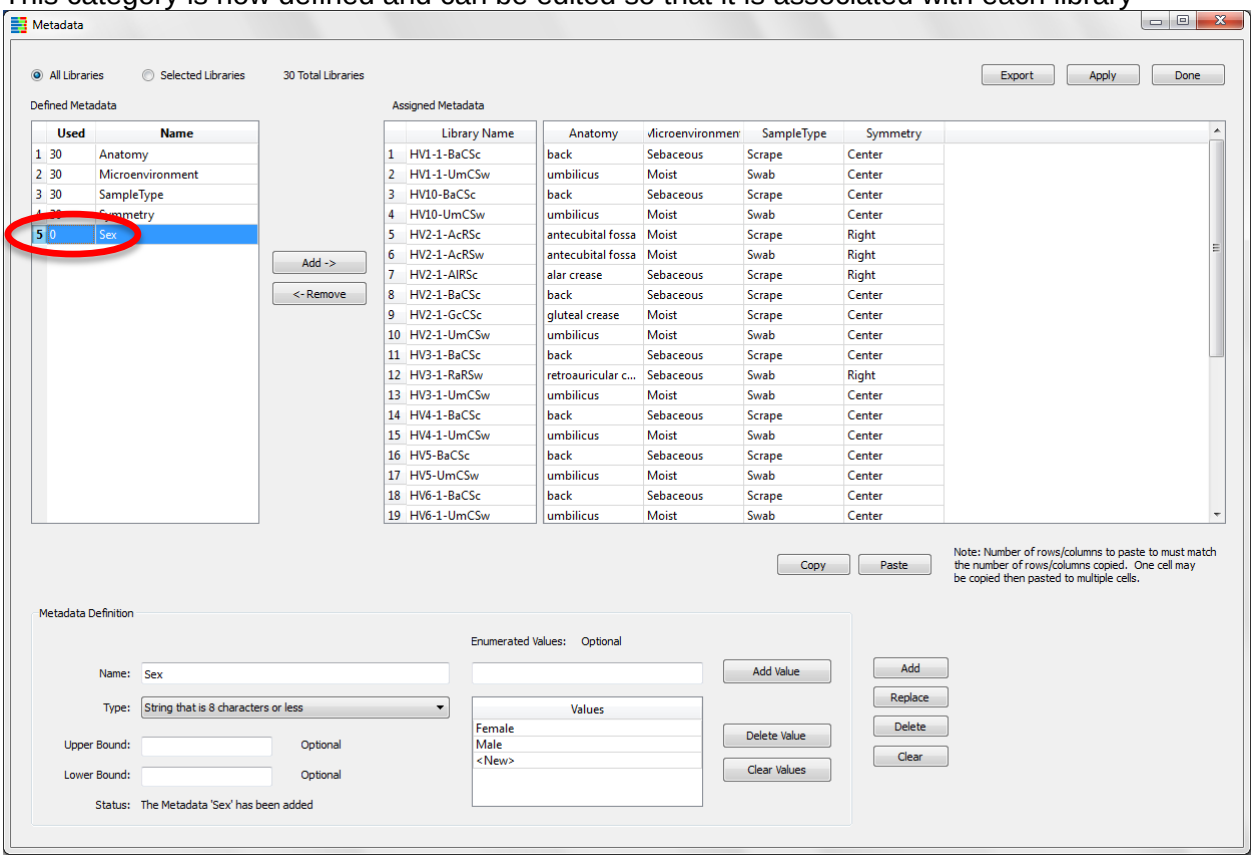


This category is now defined and can be edited so that it is associated with each library



Select “Sex” in the **Defined Metadata** pane

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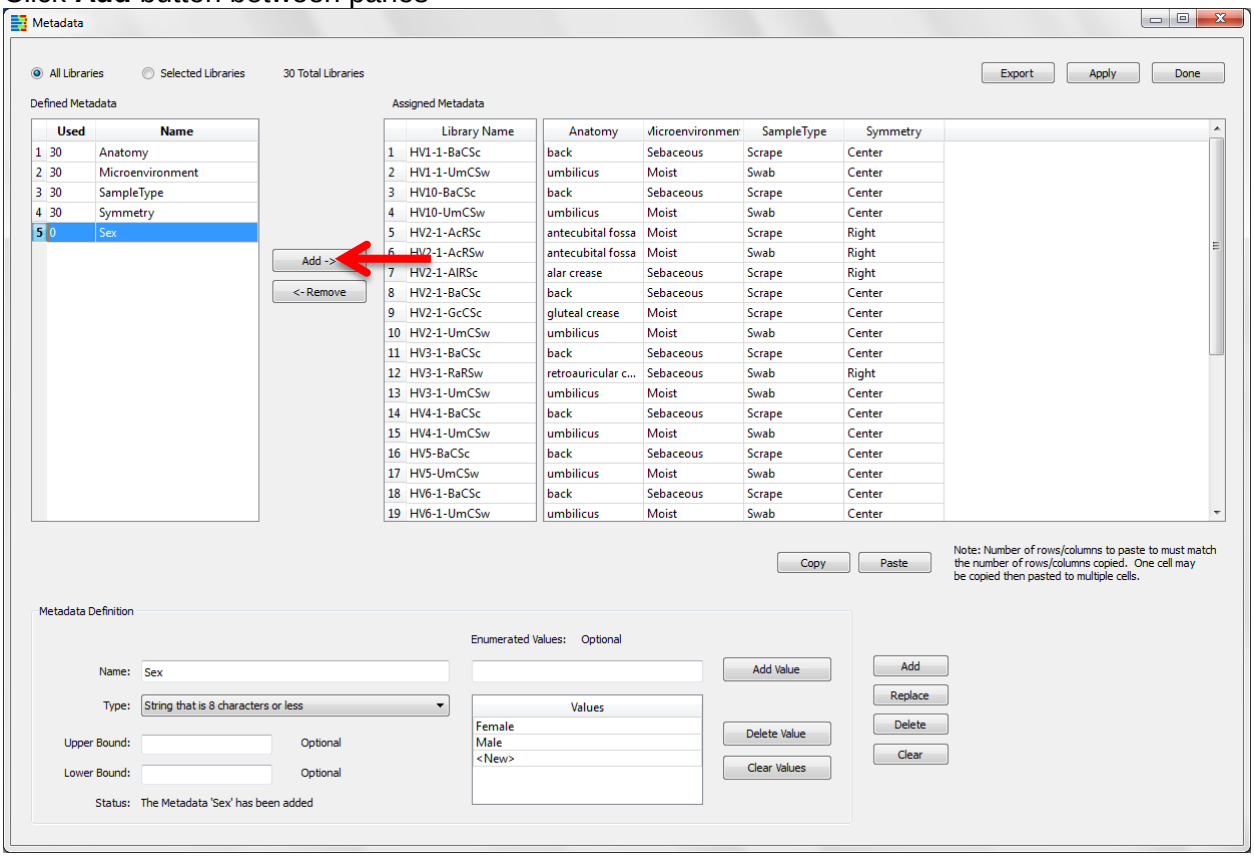
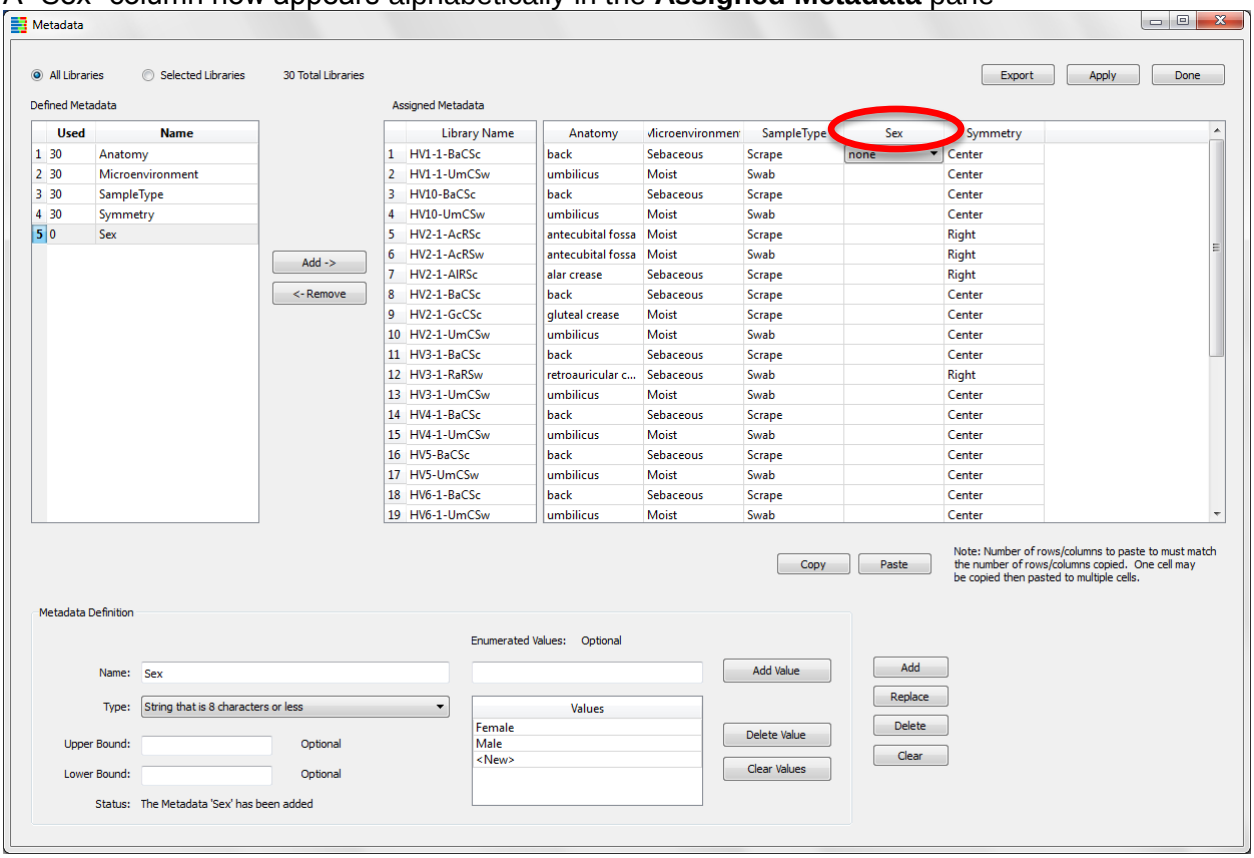
Click **Add** button between panes



A “Sex” column now appears alphabetically in the **Assigned Metadata** pane



From the drop-down selector in the first cell in the column, choose “Female”

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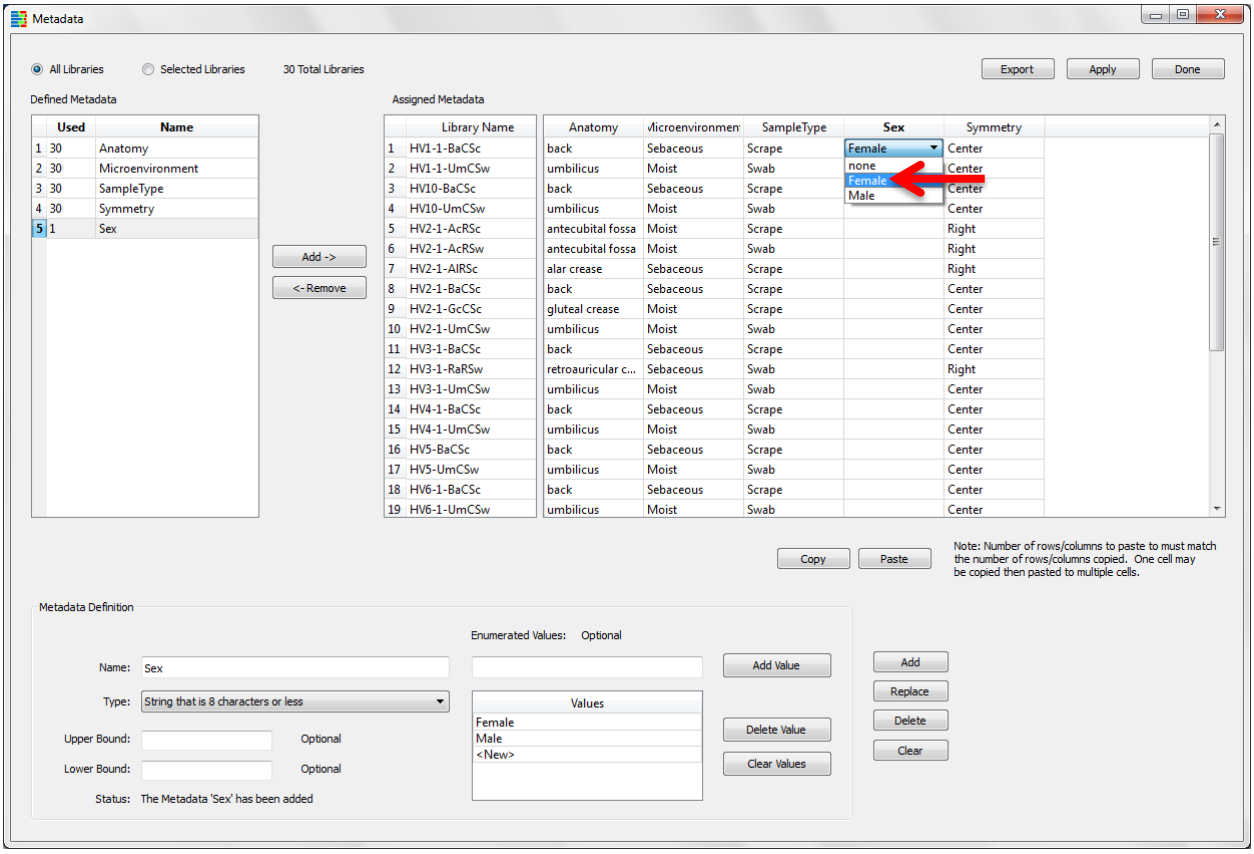
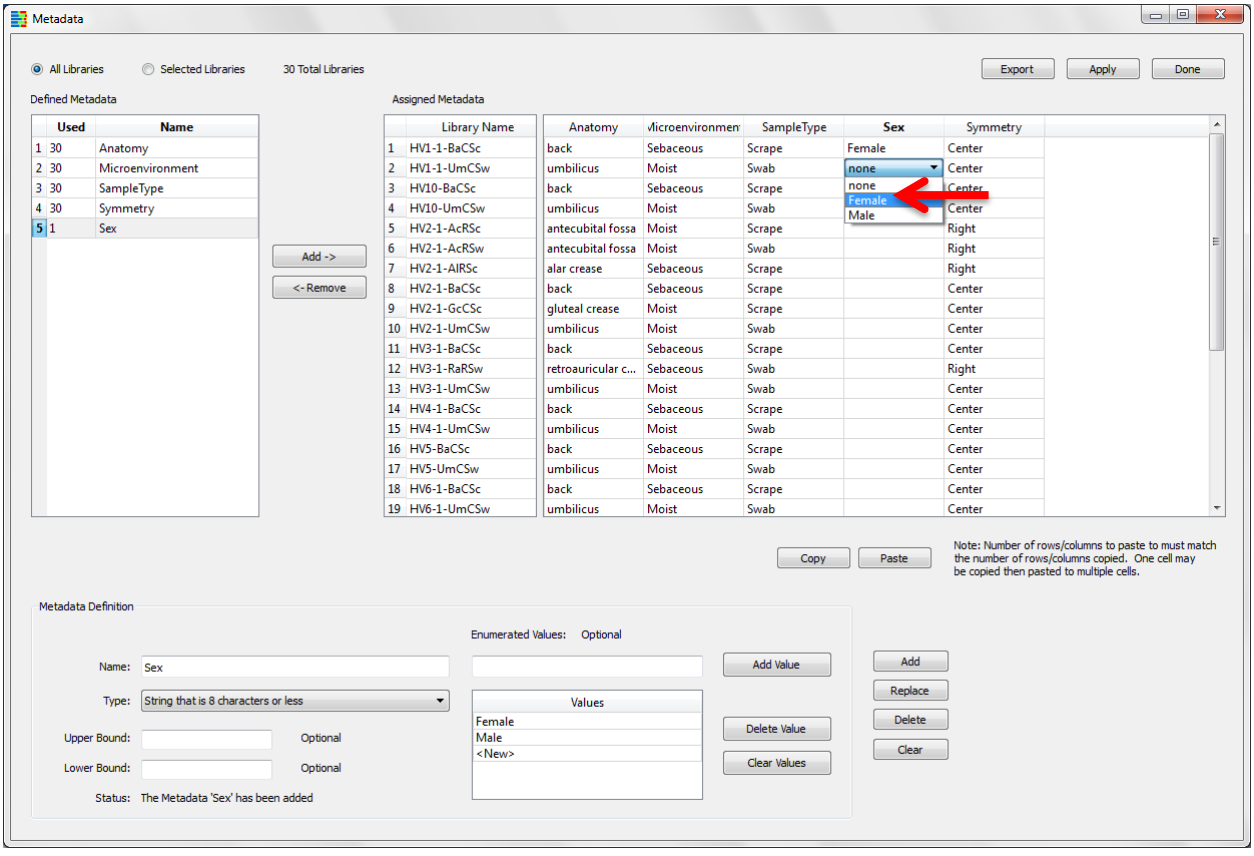


Click on the second cell in the column
A drop down selector will appear
Select “Female”



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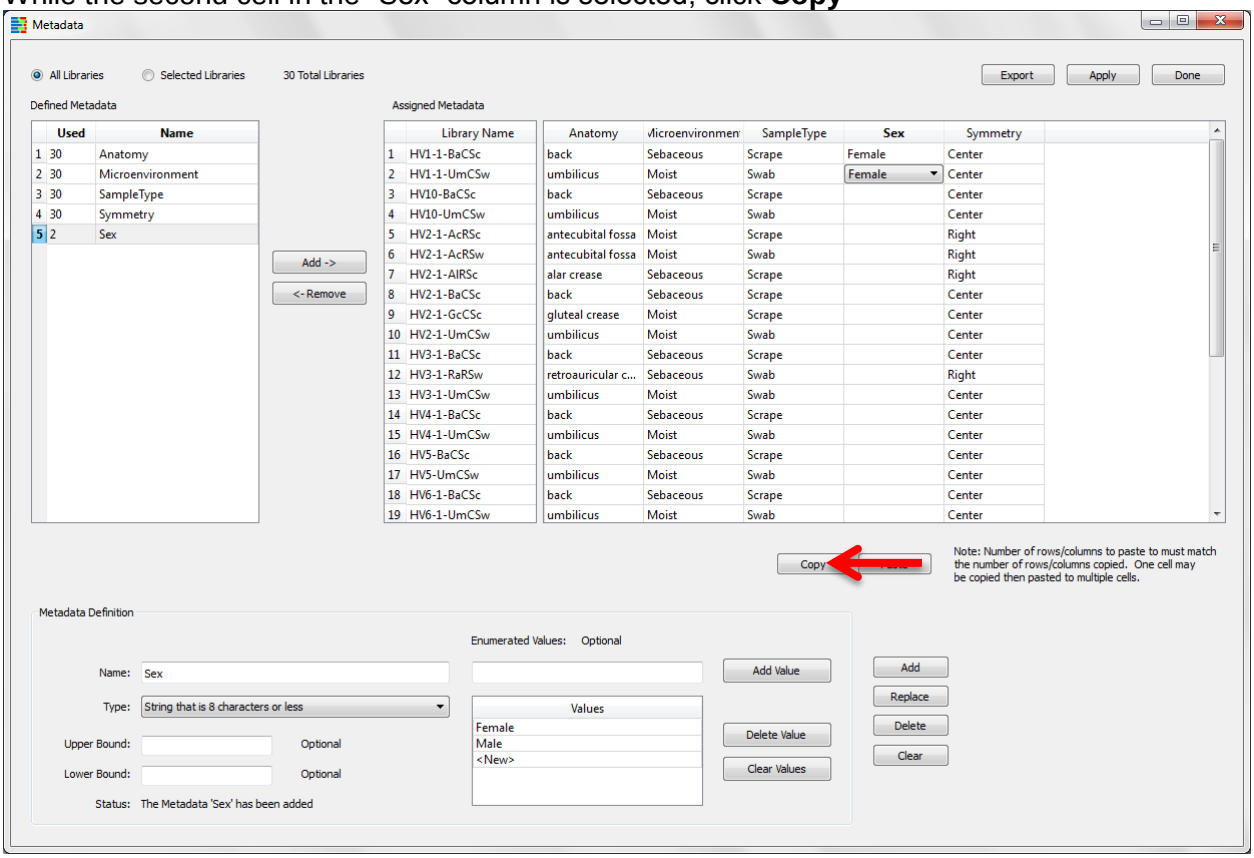
Instead of selecting the corresponding value for each library one-by-one, “Female” can be copied and pasted into multiple cells.

C. Copy and Paste Functions

While the second cell in the “Sex” column is selected, click **Copy**



For this tutorial, we will assume that libraries beginning with HV1, HV3, HV5, HV7, and HV8 are “Female”
Ctrl-click the cells whose **Library Name** begins with these numbers
Click **Paste**

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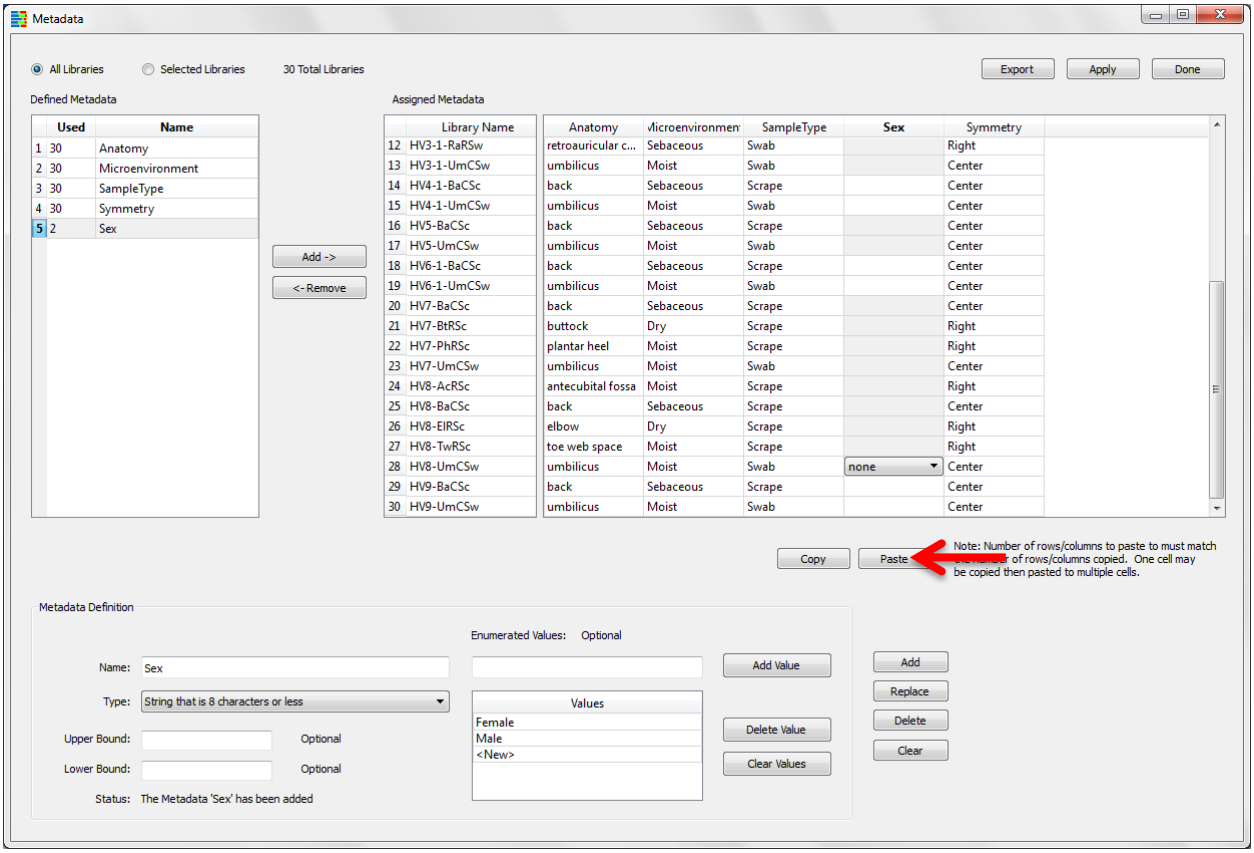
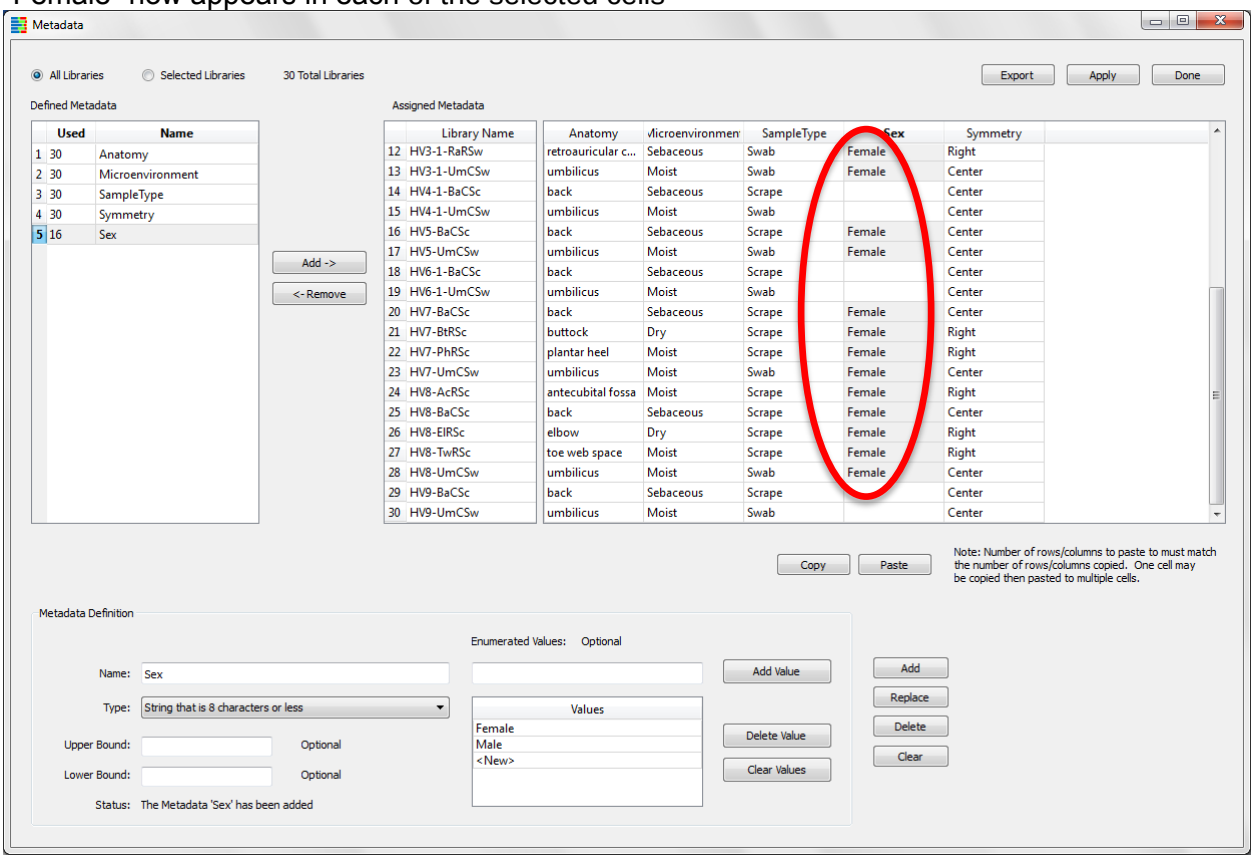


"Female" now appears in each of the selected cells



To fill in the remaining empty cells with "Male", click on the third cell in the column
A drop-down selector will appear
Select "Male"

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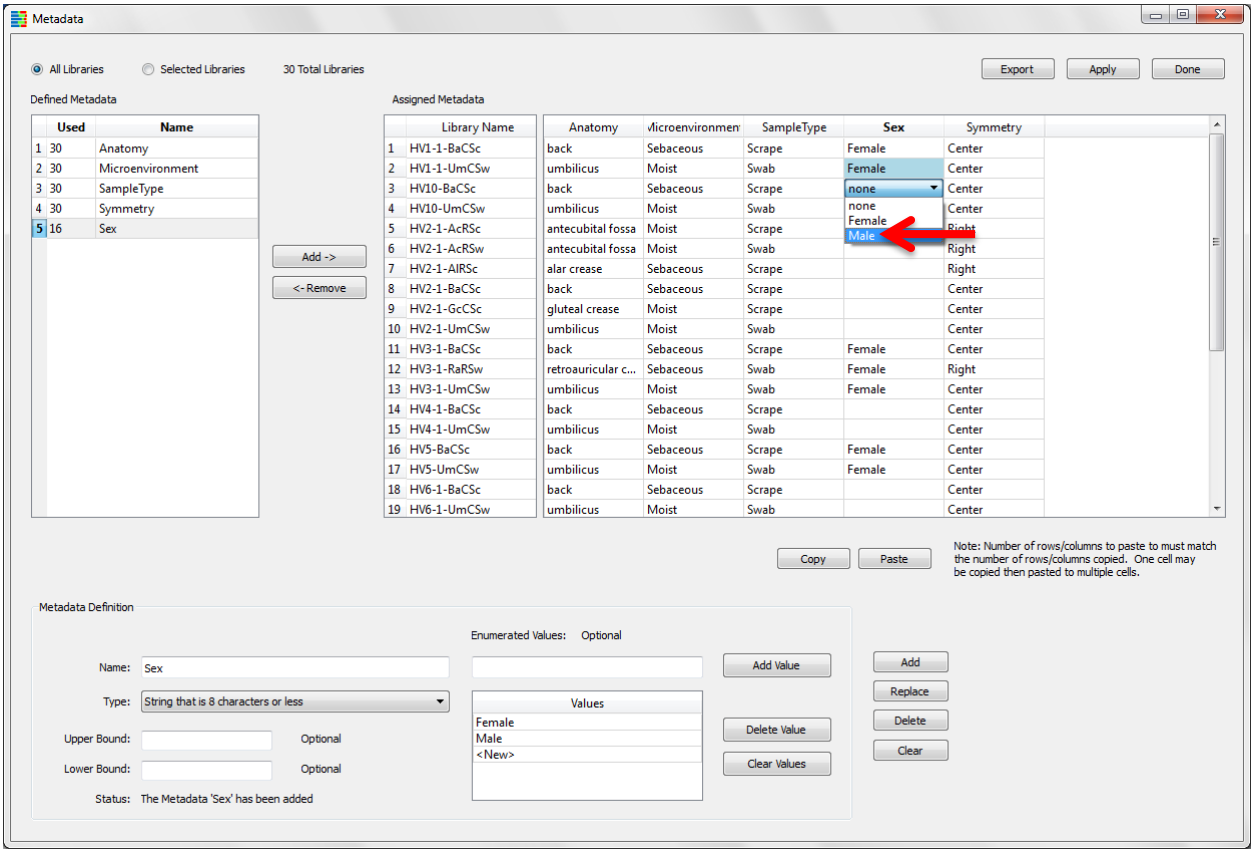
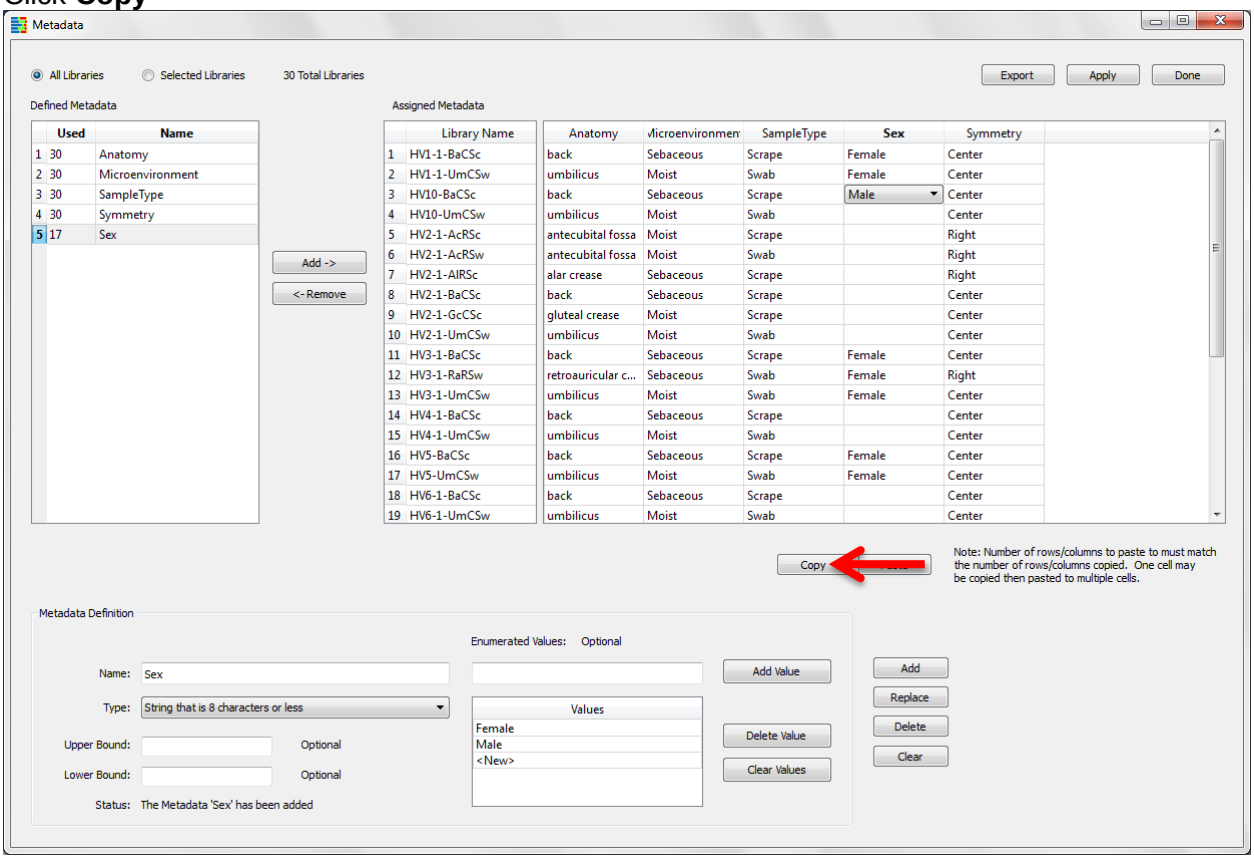


Click **Copy**



For this tutorial, we will assume that libraries beginning with HV10, HV2, HV4, HV6, and HV9 are “Male”
Ctrl-click the remaining empty cells whose **Library Name** begins with these numbers
Click **Paste**

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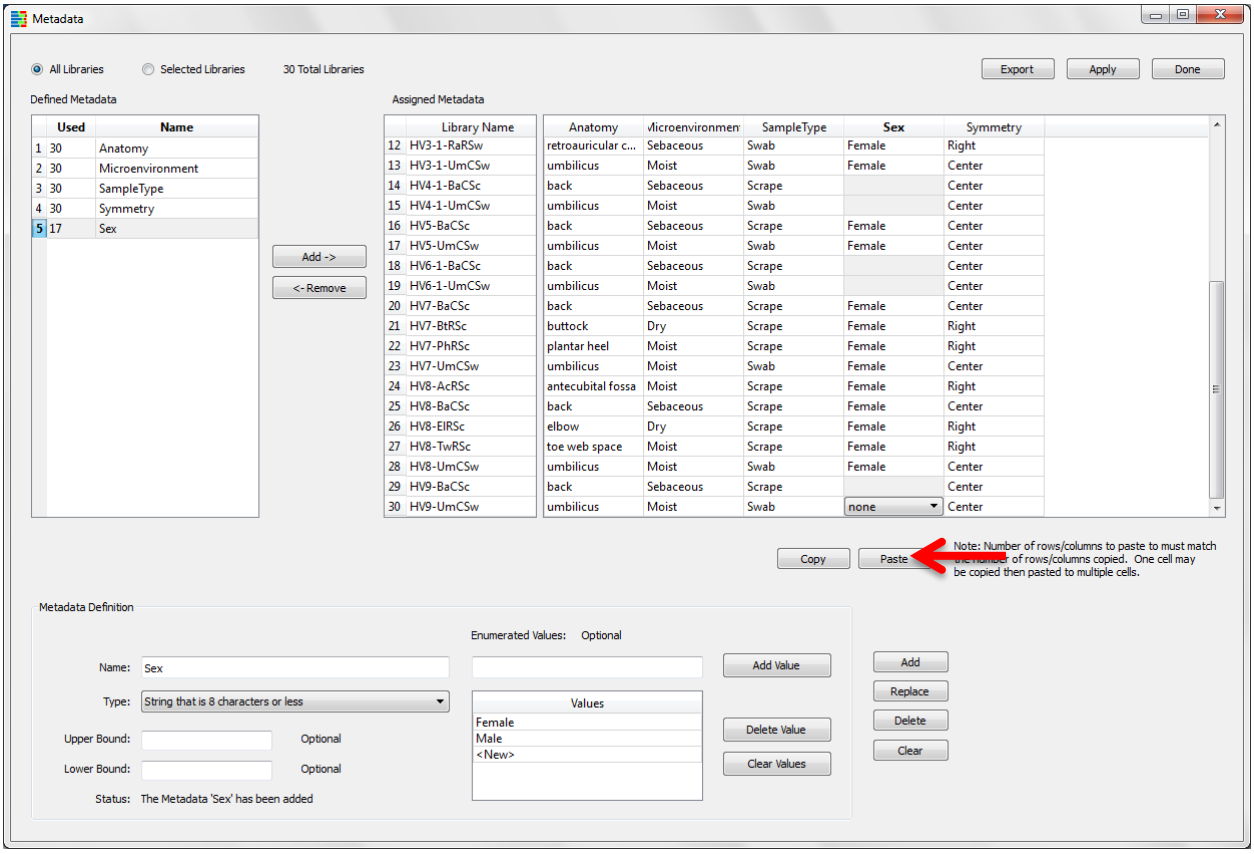
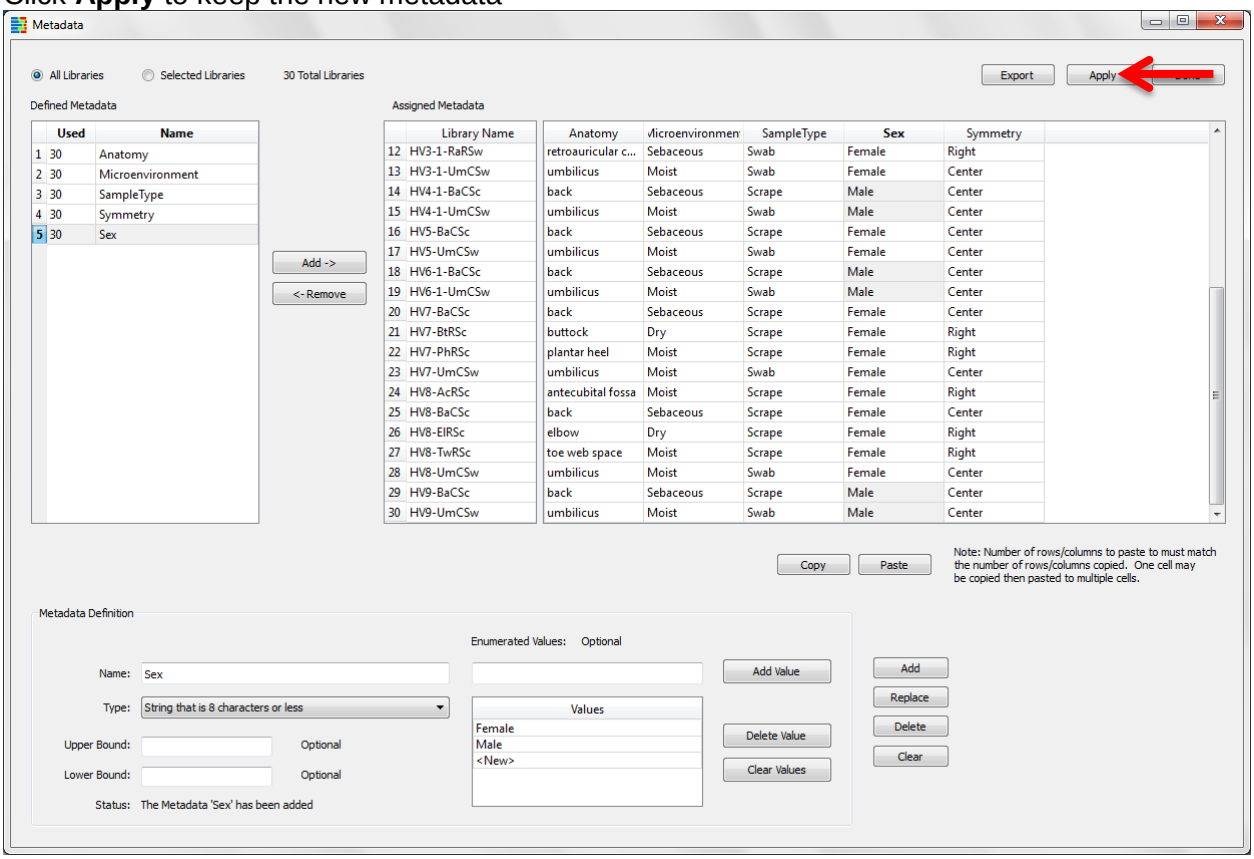


Click **Apply** to keep the new metadata



Each library in the project is now assigned as “Male” or “Female” for the “Sex” metadata category

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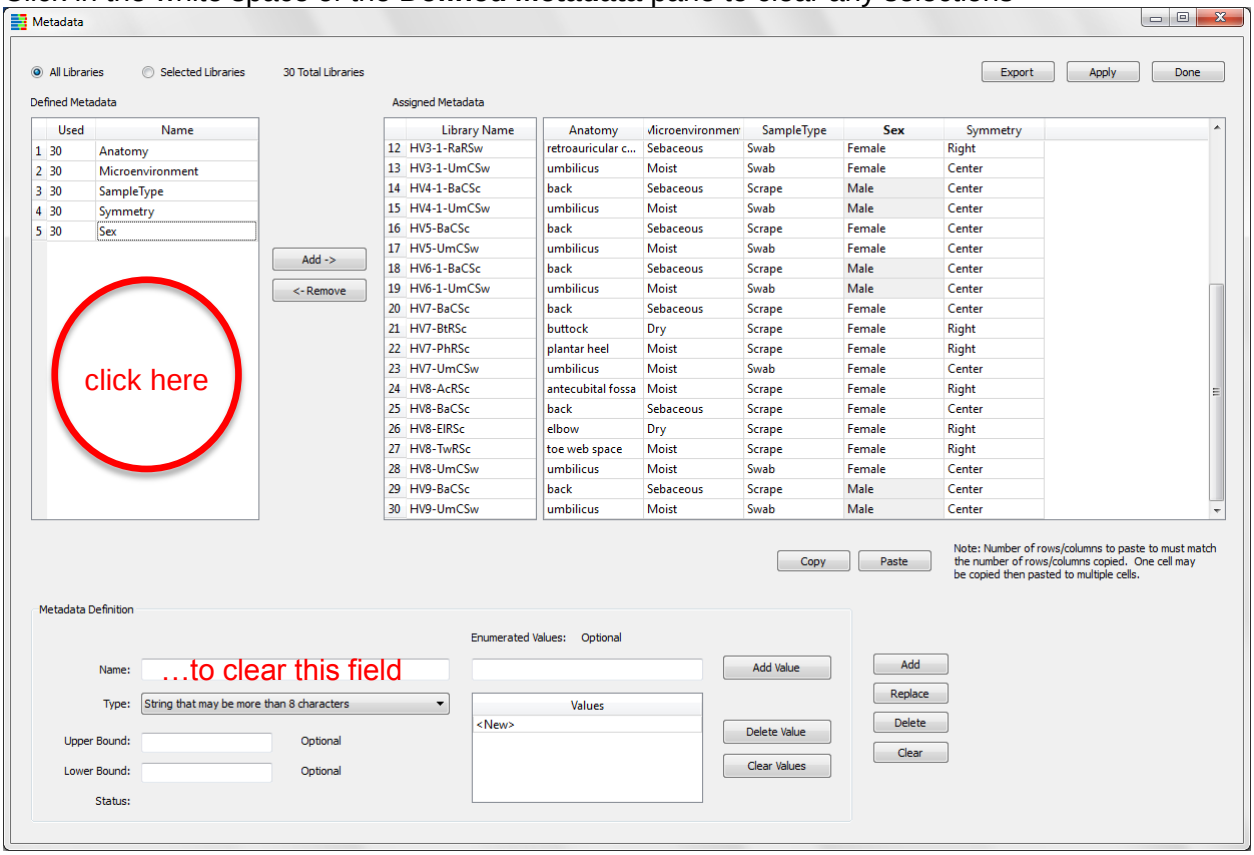
Now we will create another new metadata category and assign a value to each library. For this example, we will create a new metadata category of “Age”, and we will assign a variety of ages to the collection of libraries.

D. Create 64 bit Integer Metadata

Because there is high variability in the ages of the patients, we will not create **Enumerated Values**. Instead, the values will be entered manually for each library. This metadata category is in the format of a **64 bit Integer** (a whole number/number with no fractional part).

Click in the white space of the **Defined Metadata** pane to clear any selections



Type “Age” into **Name** field
In **Type** drop-down, choose **64 bit Integer**

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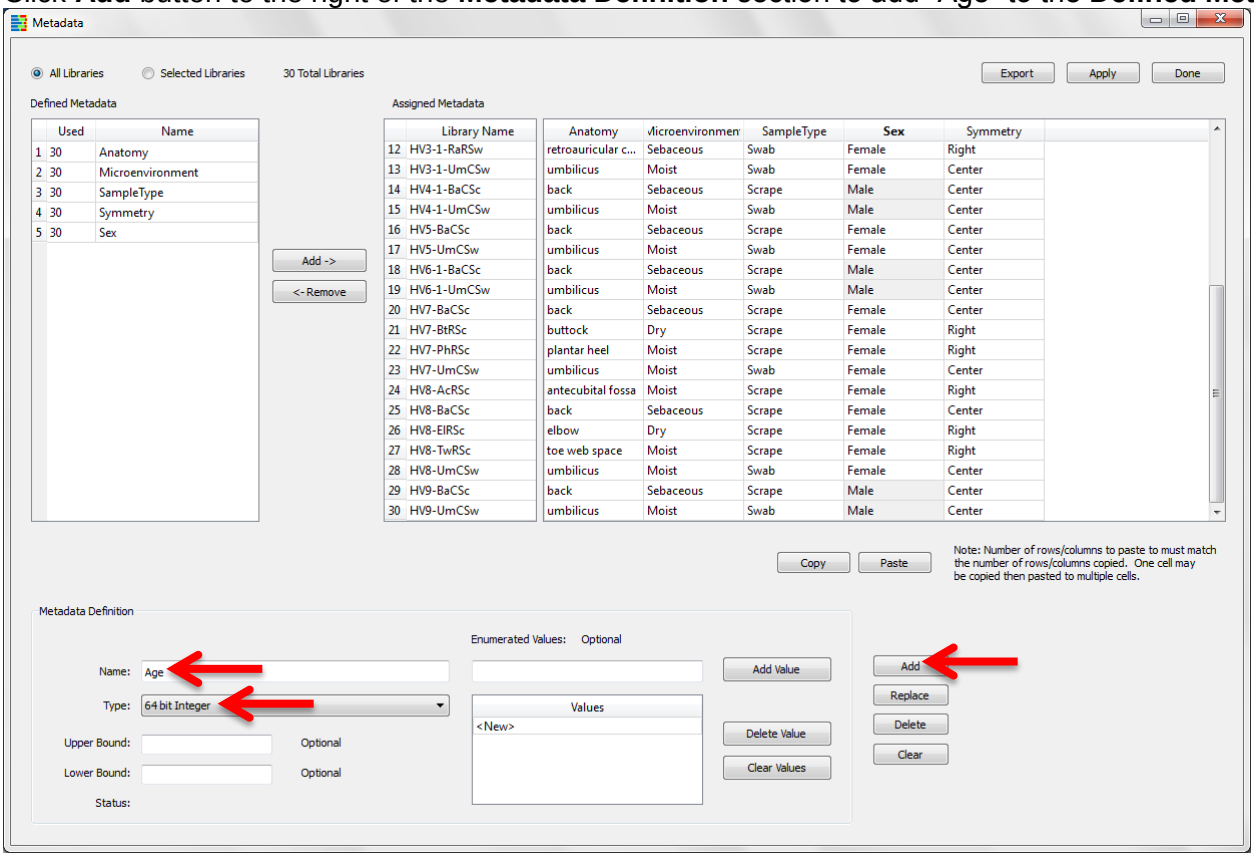
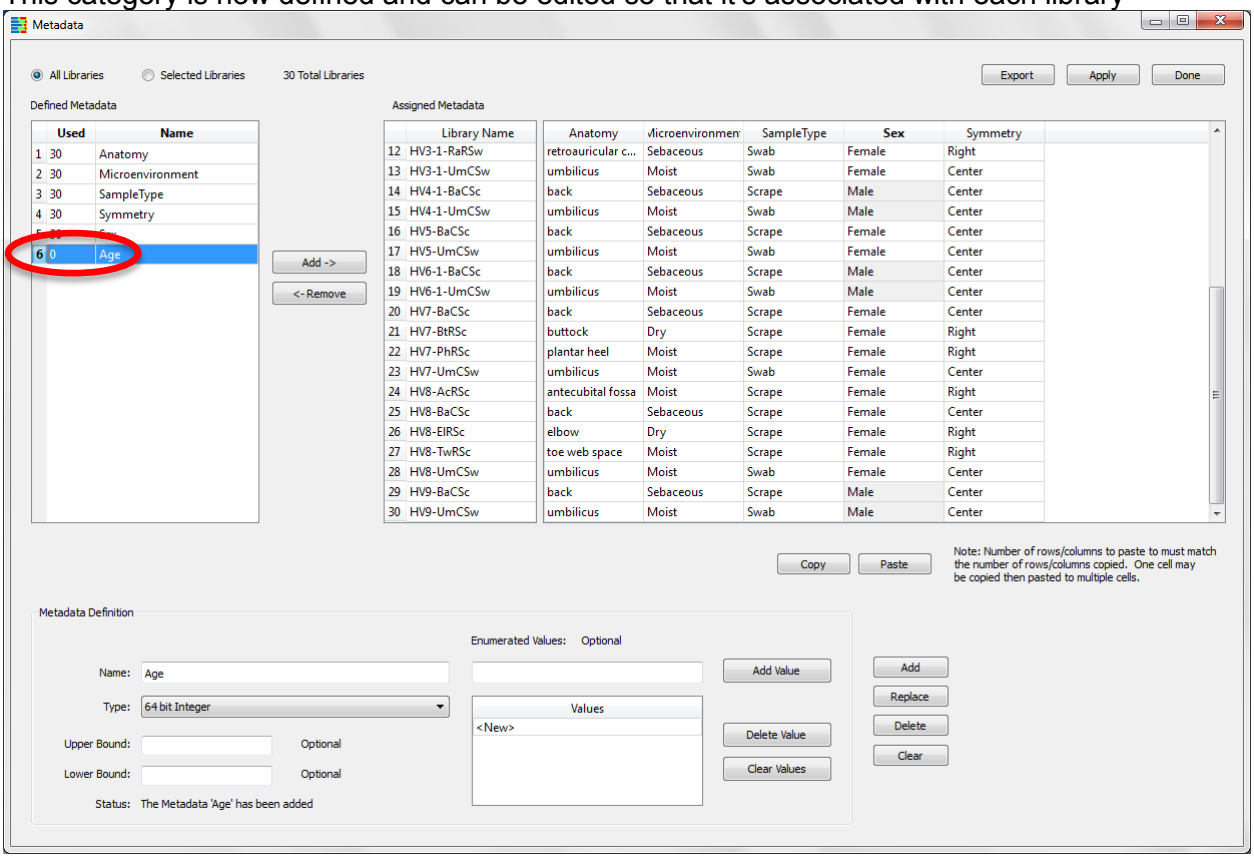
Click **Add** button to the right of the **Metadata Definition** section to add “Age” to the **Defined Metadata** list



This category is now defined and can be edited so that it’s associated with each library



Select “Age” in the **Defined Metadata** pane
Click **Add** button between panes

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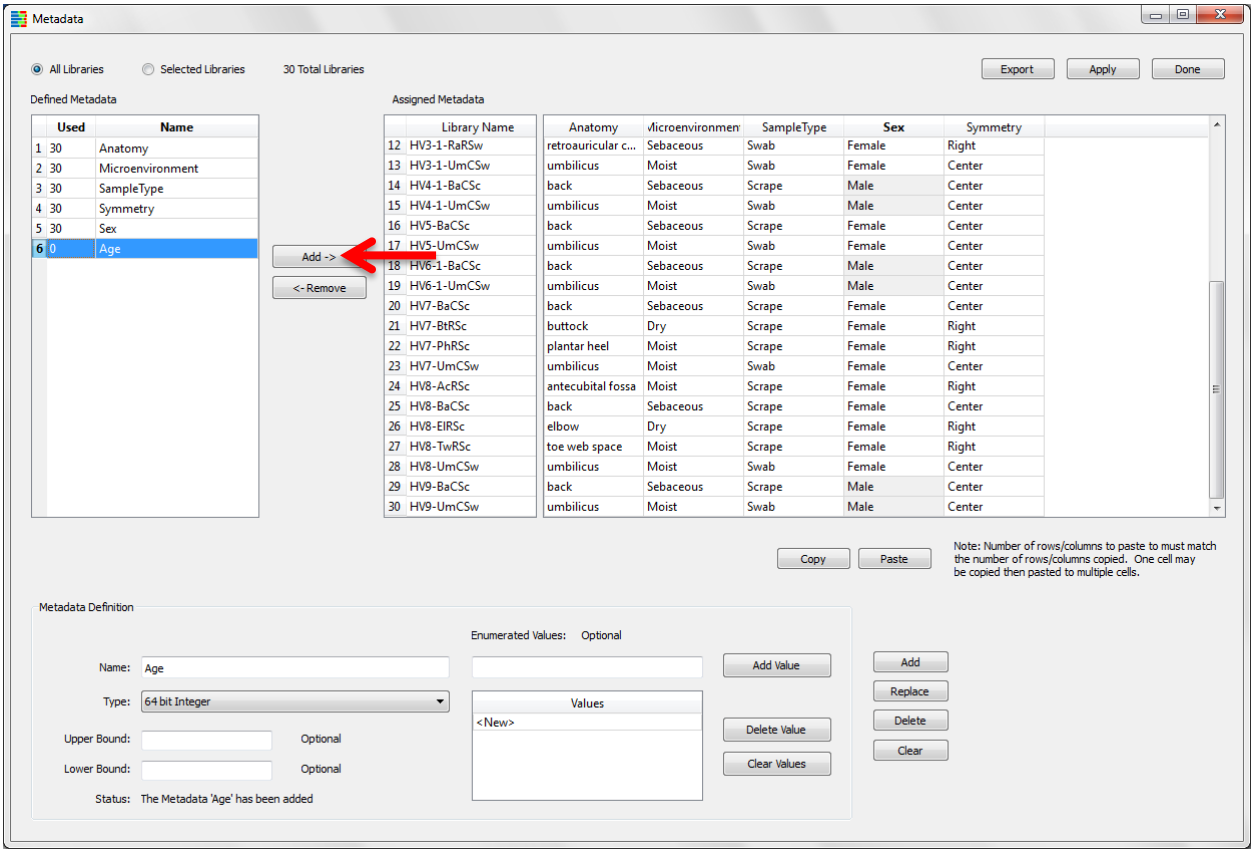
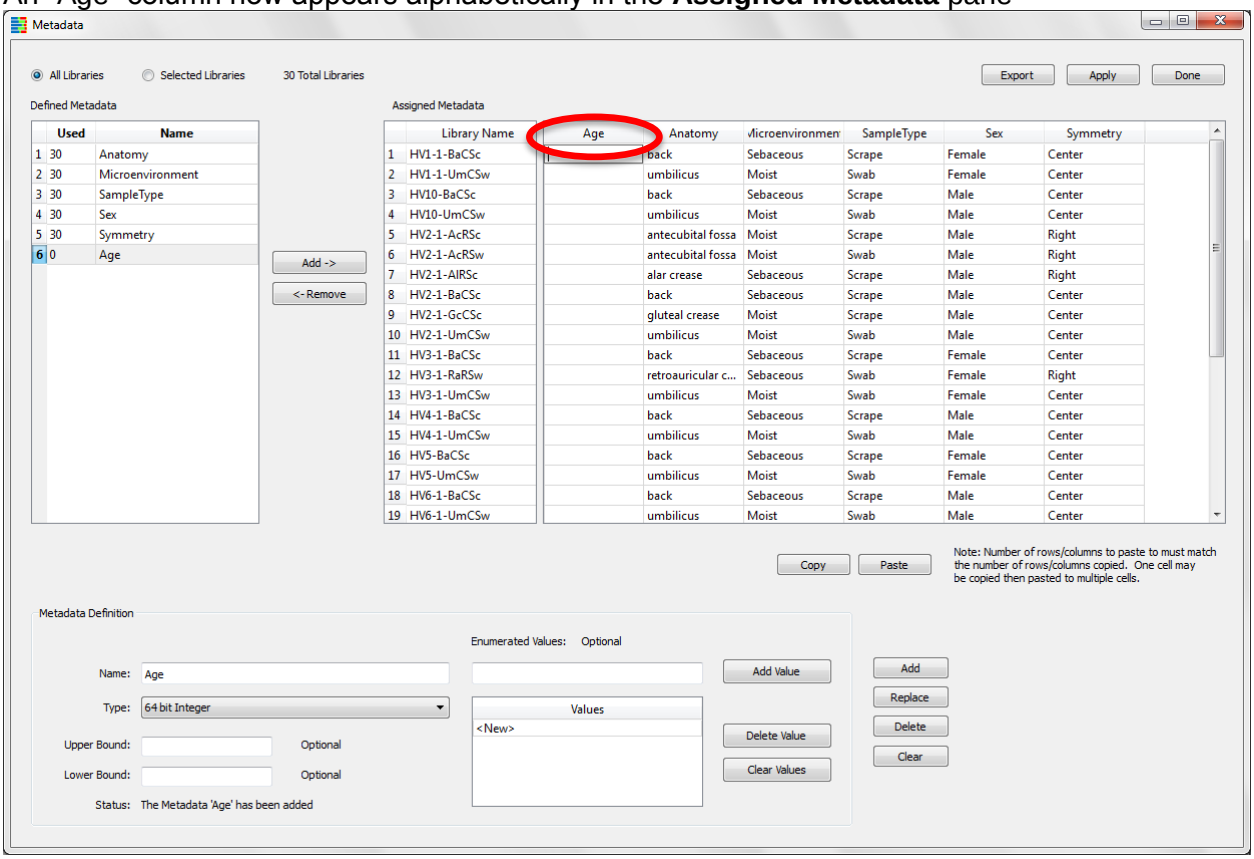


An “Age” column now appears alphabetically in the **Assigned Metadata** pane



For this tutorial, we will assume that libraries beginning with HV1 = 37 years old, HV10 = 36 yrs, HV2 = 48 yrs, HV3 = 63 yrs, HV4 = 74 yrs, HV5 = 34 yrs, HV6 = 52 yrs, HV7 = 54 yrs, HV8 = 41 yrs and HV9 = 75 yrs.

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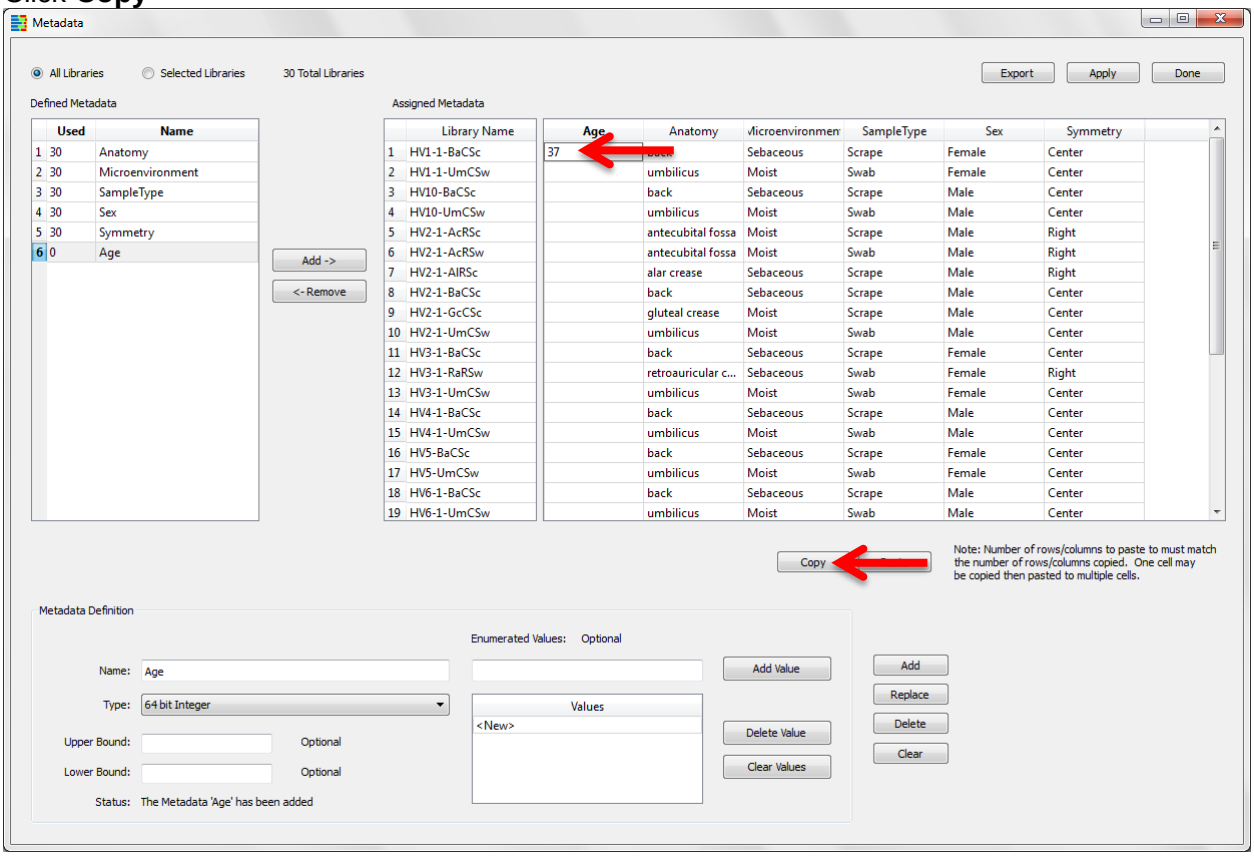
Because the ages are highly variable, it would probably be a waste of time to create **Enumerated Values**, so we will manually enter the ages and then use the **Copy**/**Paste** functions to fill the values down.

Enter “37” into the first cell in the “Age” column
Click **Copy**



Click the other HV1 “Age” cell (in row 2)
Click **Paste**

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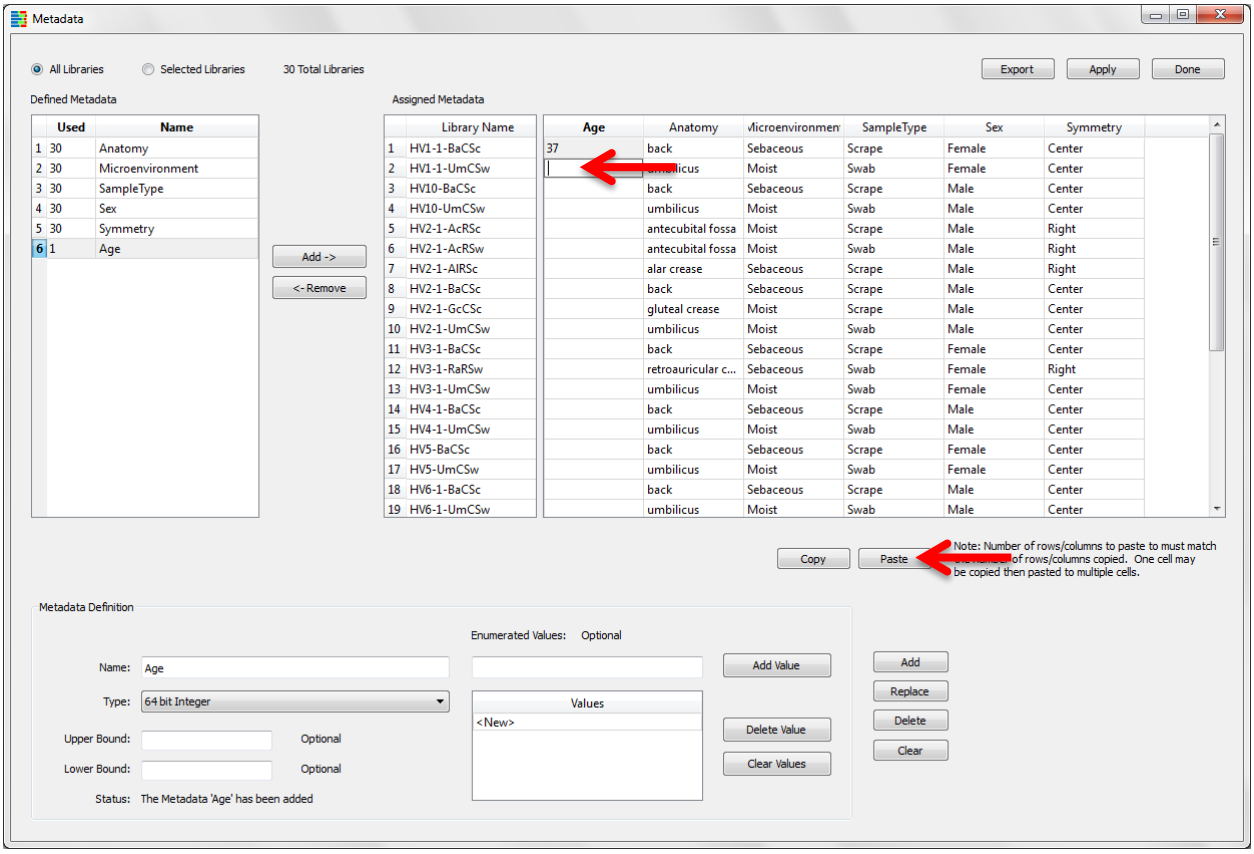
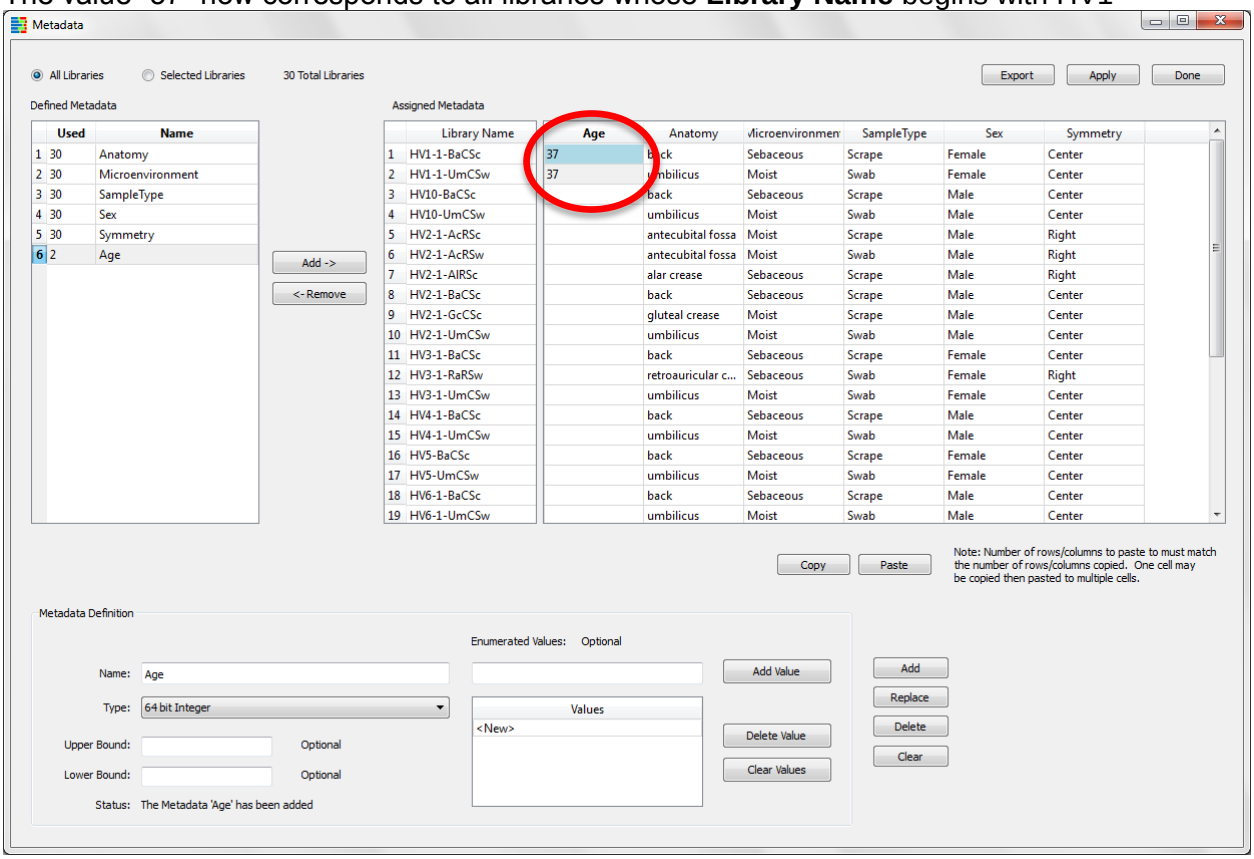


The value “37” now corresponds to all libraries whose **Library Name** begins with HV1



Click on the third cell in the column
Enter “36” into the third cell in the “Age” column
Click **Copy**

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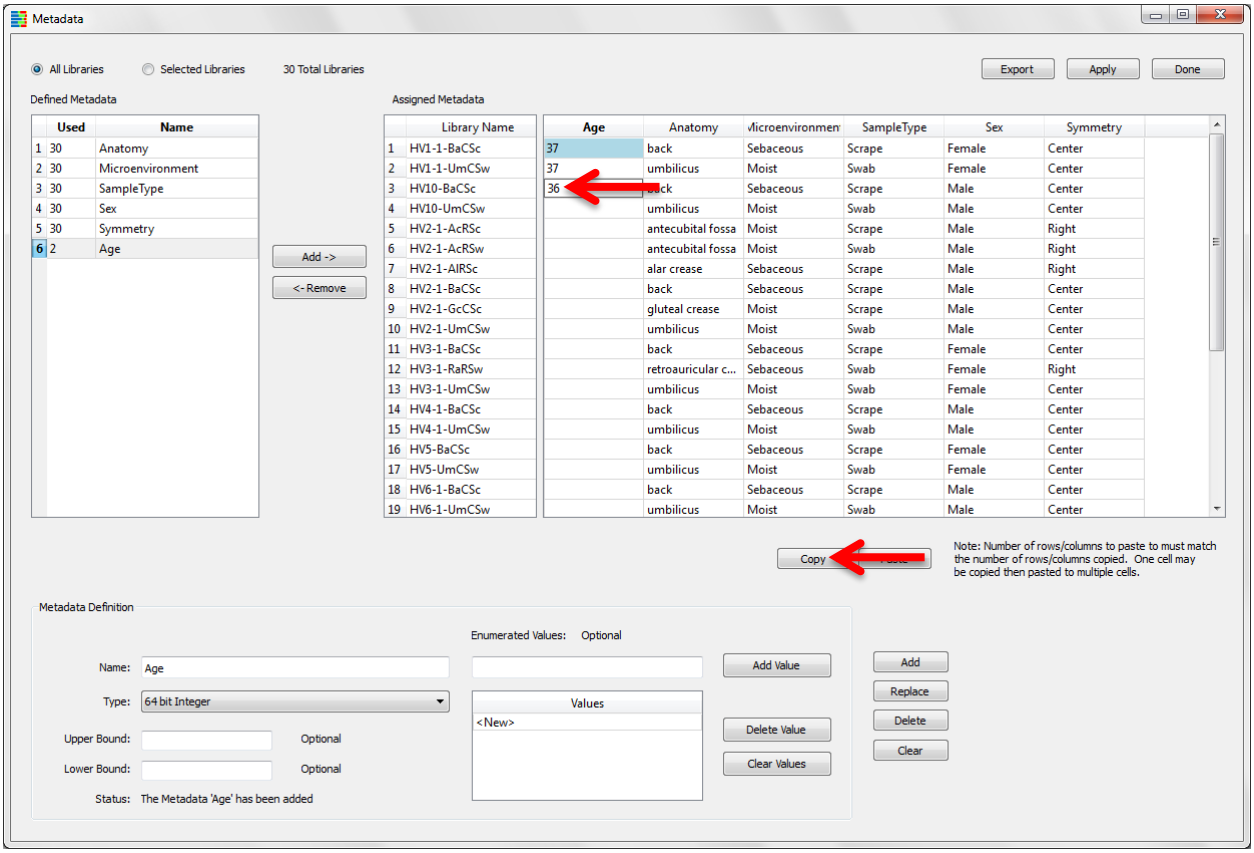
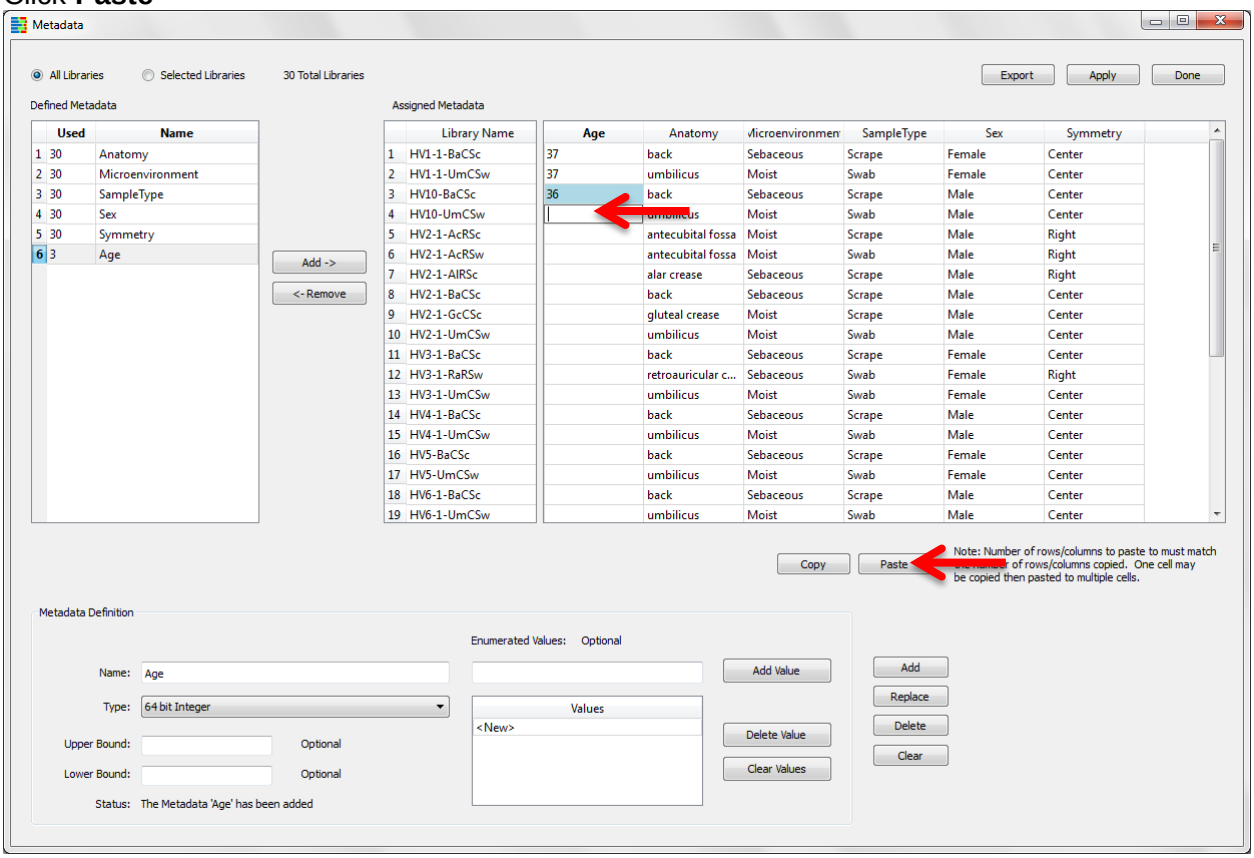


Click the other HV10 “Age” cell (in row 4)
Click **Paste**



The value “36” now corresponds to all libraries whose **Library Name** begins with HV10

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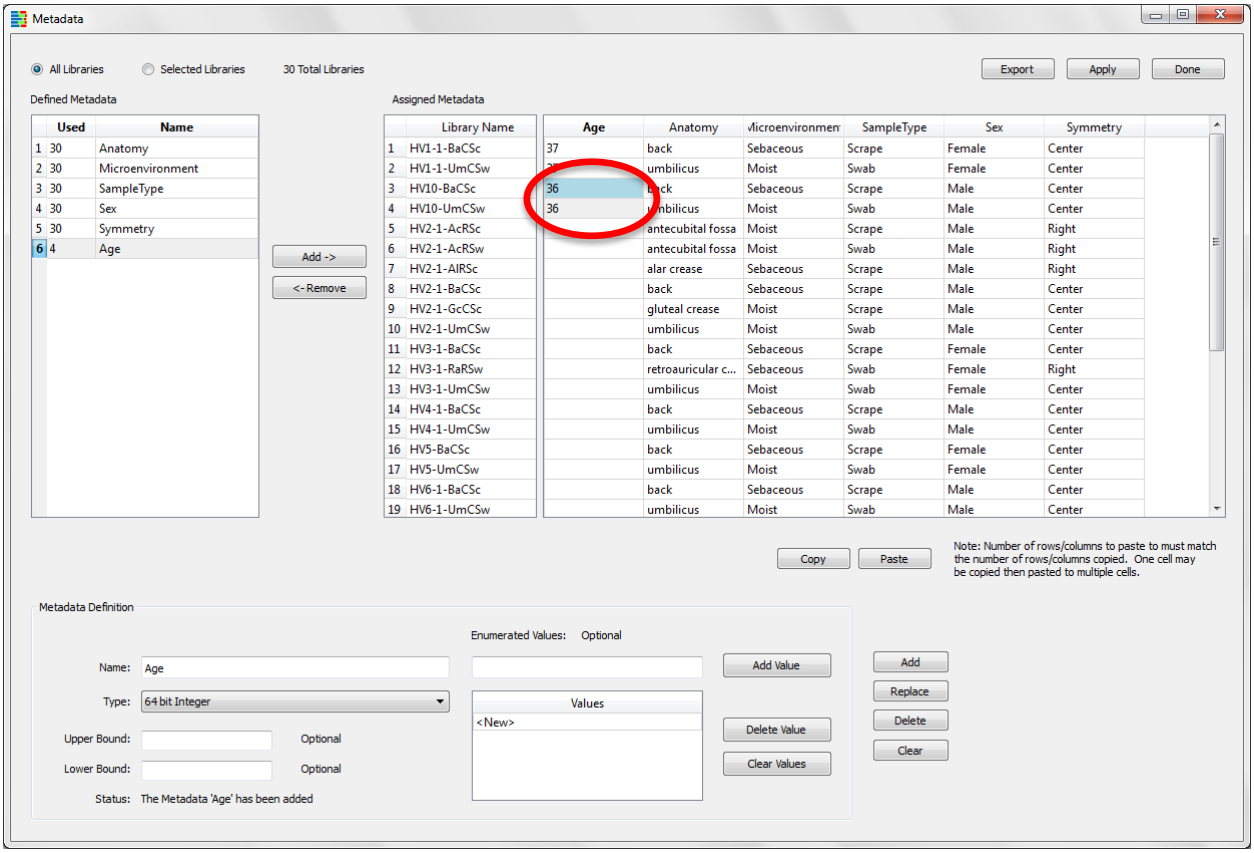
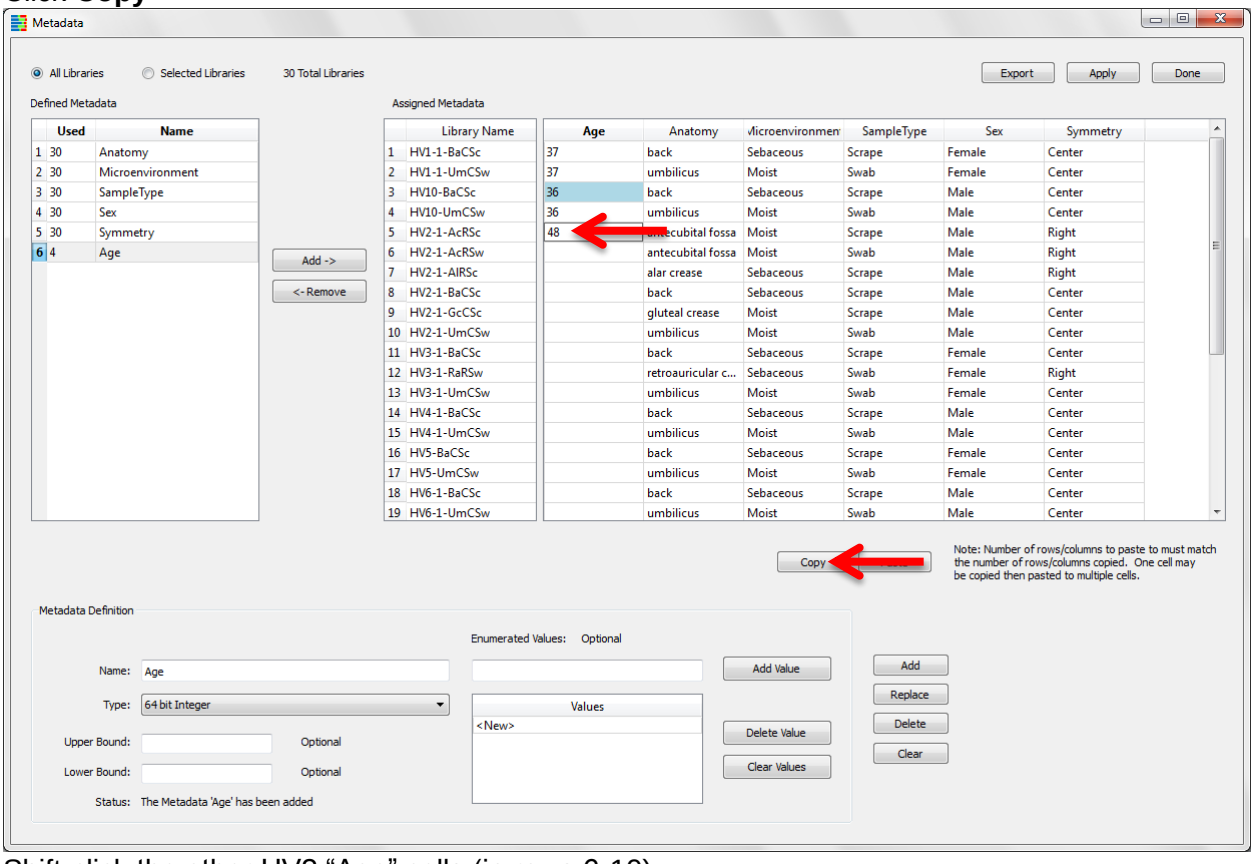


Click on the fifth cell in the column
Enter “48” into the fifth cell in the “Age” column
Click **Copy**



Shift-click the other HV2 “Age” cells (in rows 6-10)

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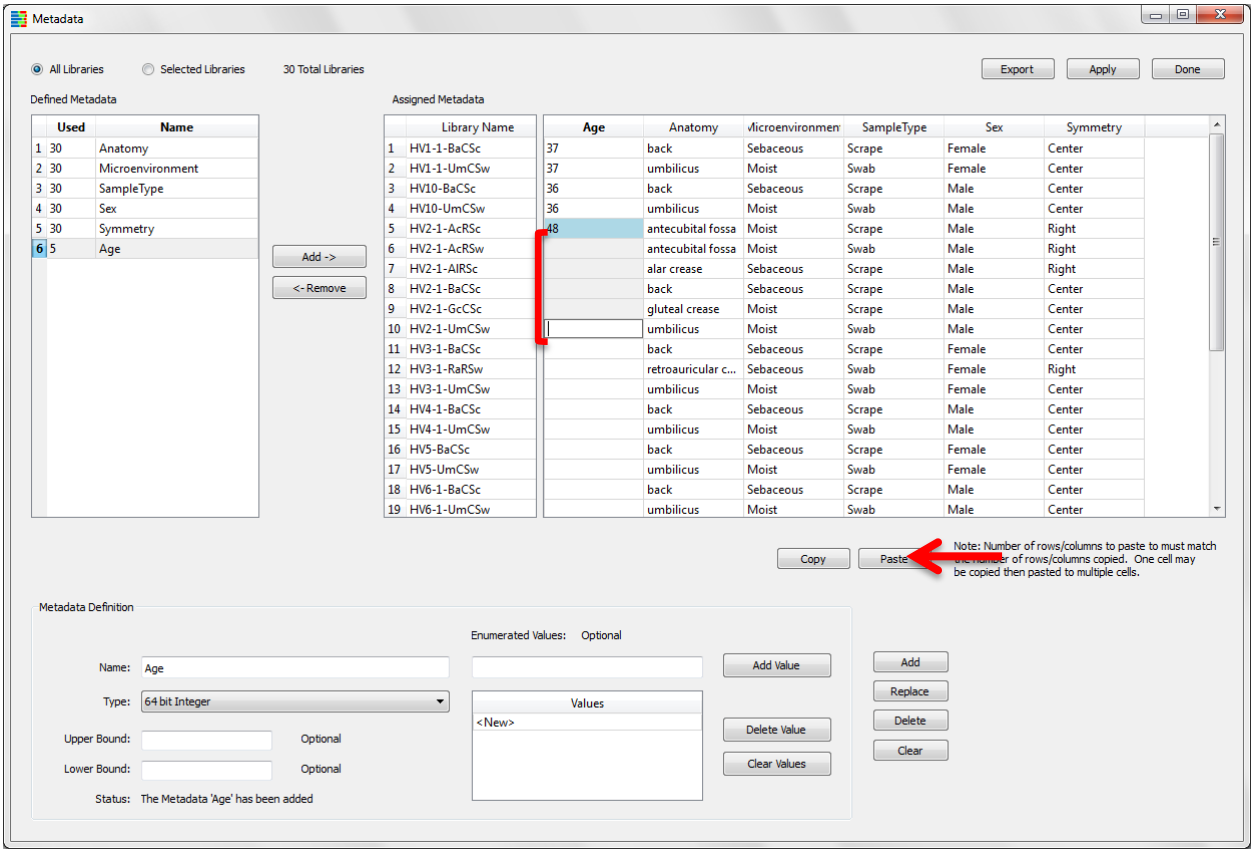
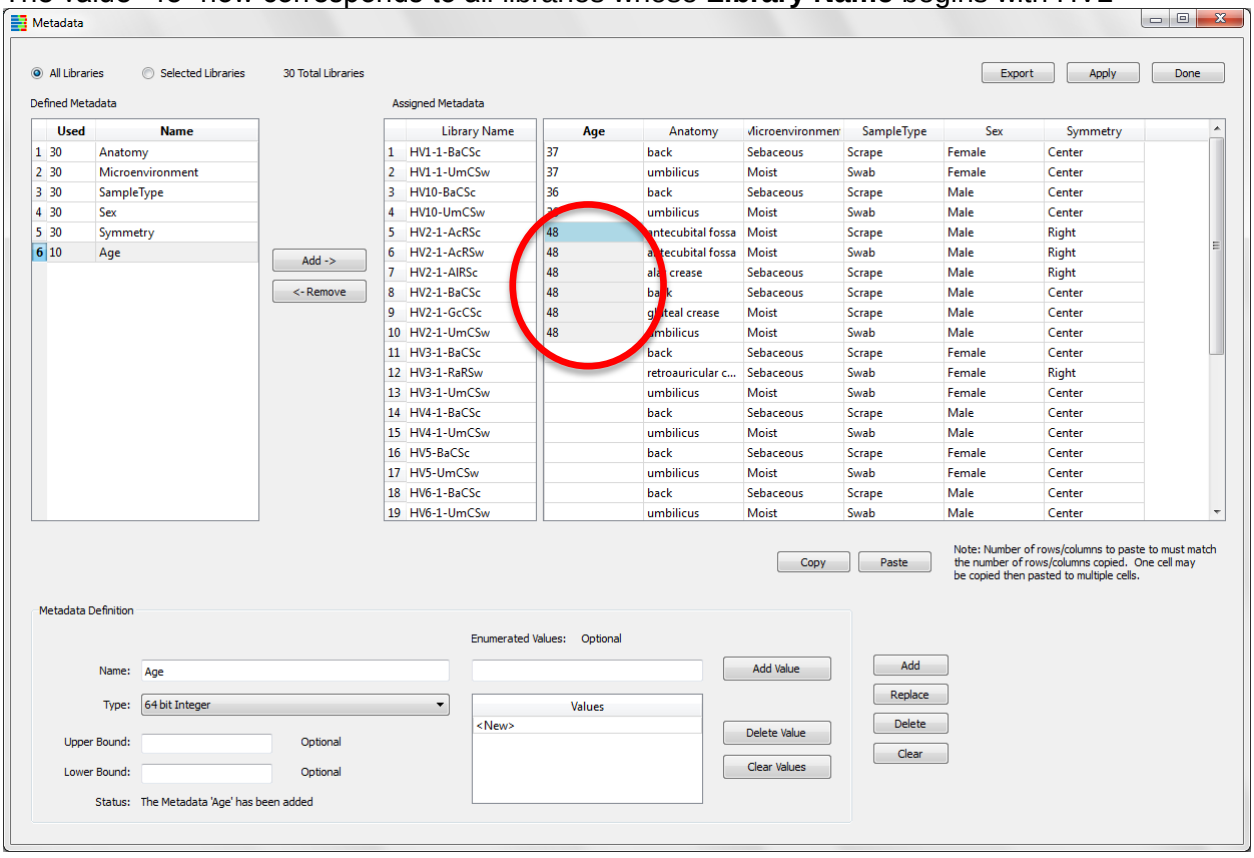
Click **Paste**



The value “48” now corresponds to all libraries whose **Library Name** begins with HV2



Repeat the same process until the “Age” column is completely filled in…

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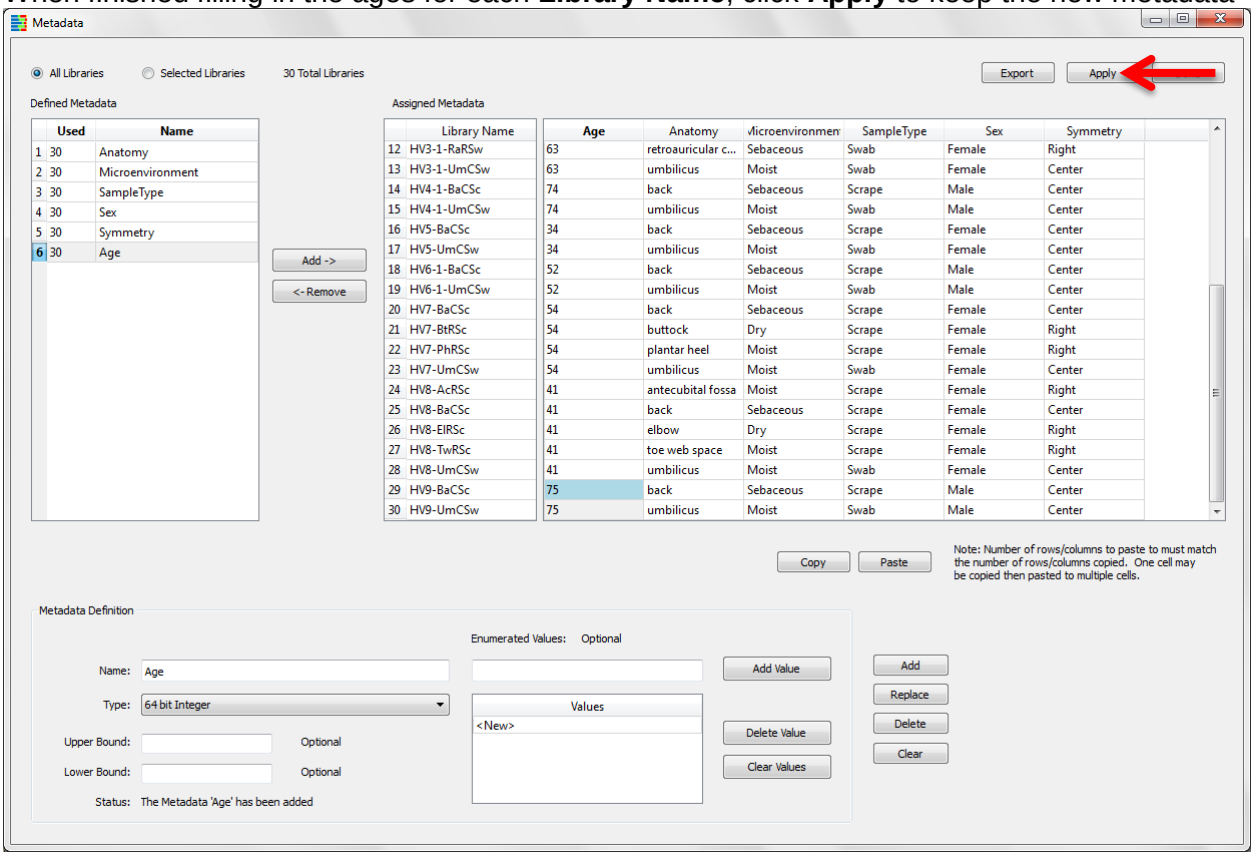
(Reminder: For this tutorial, we will assume that libraries beginning with HV1 = 37 years old, HV10 = 36 yrs, HV2 = 48 yrs, HV3 = 63 yrs, HV4 = 74 yrs, HV5 = 34 yrs, HV6 = 52 yrs, HV7 = 54 yrs, HV8 = 41 yrs and HV9 = 75 yrs.)

When finished filling in the ages for each **Library Name**, click **Apply** to keep the new metadata



Each library in the project is now assigned a number for the “Age” metadata category
Click **Done** to return to the “Workspace 1” window

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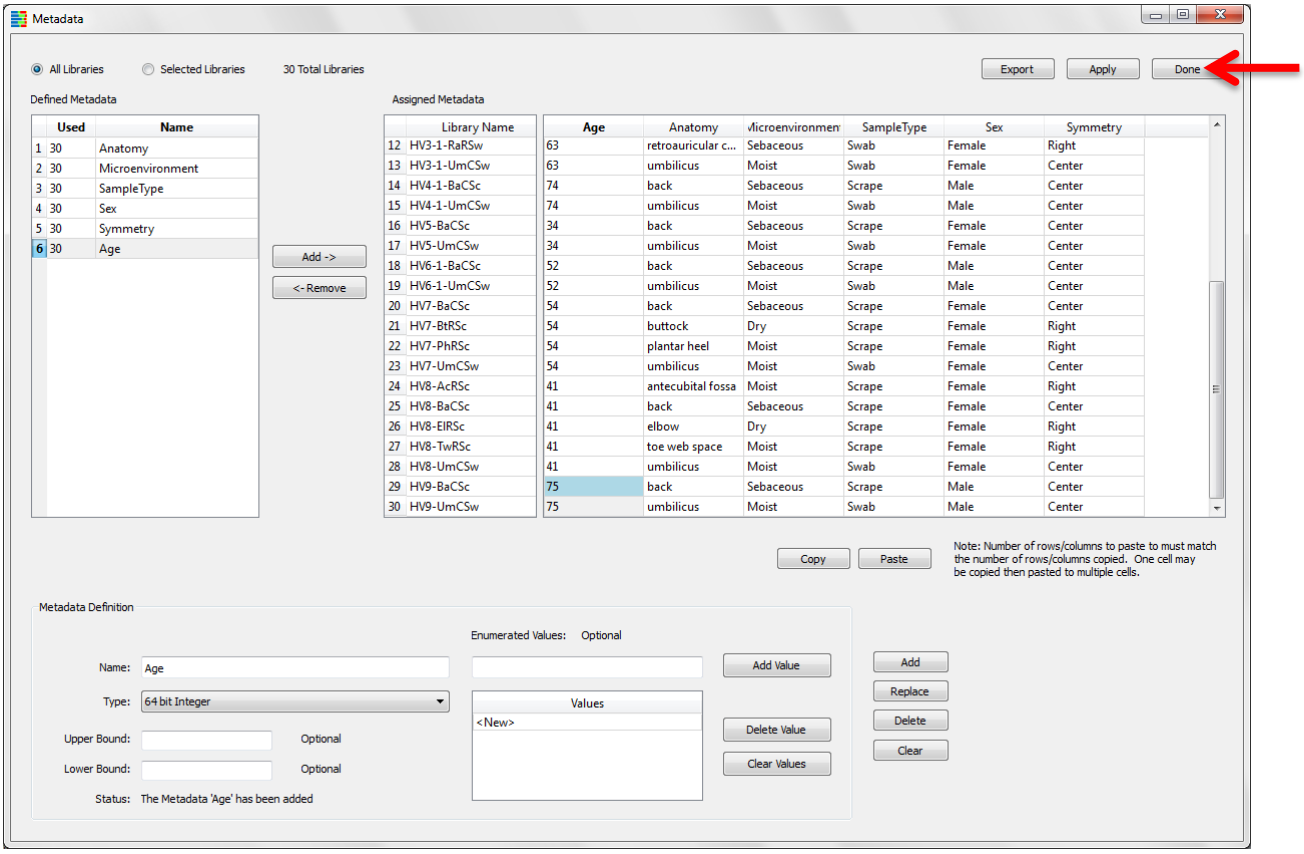

II. Create a Filter with the New Metadata Categories

The newly created metadata categories, “Sex” and “Age”, function exactly as the previously imported (see the basic tutorial) metadata. To demonstrate this, we will create a filter to **Select Libraries**.

A. Create a Filter

Data → Select Libraries
New pop-up window appears for creation of filters
Click **New** on far right side of window

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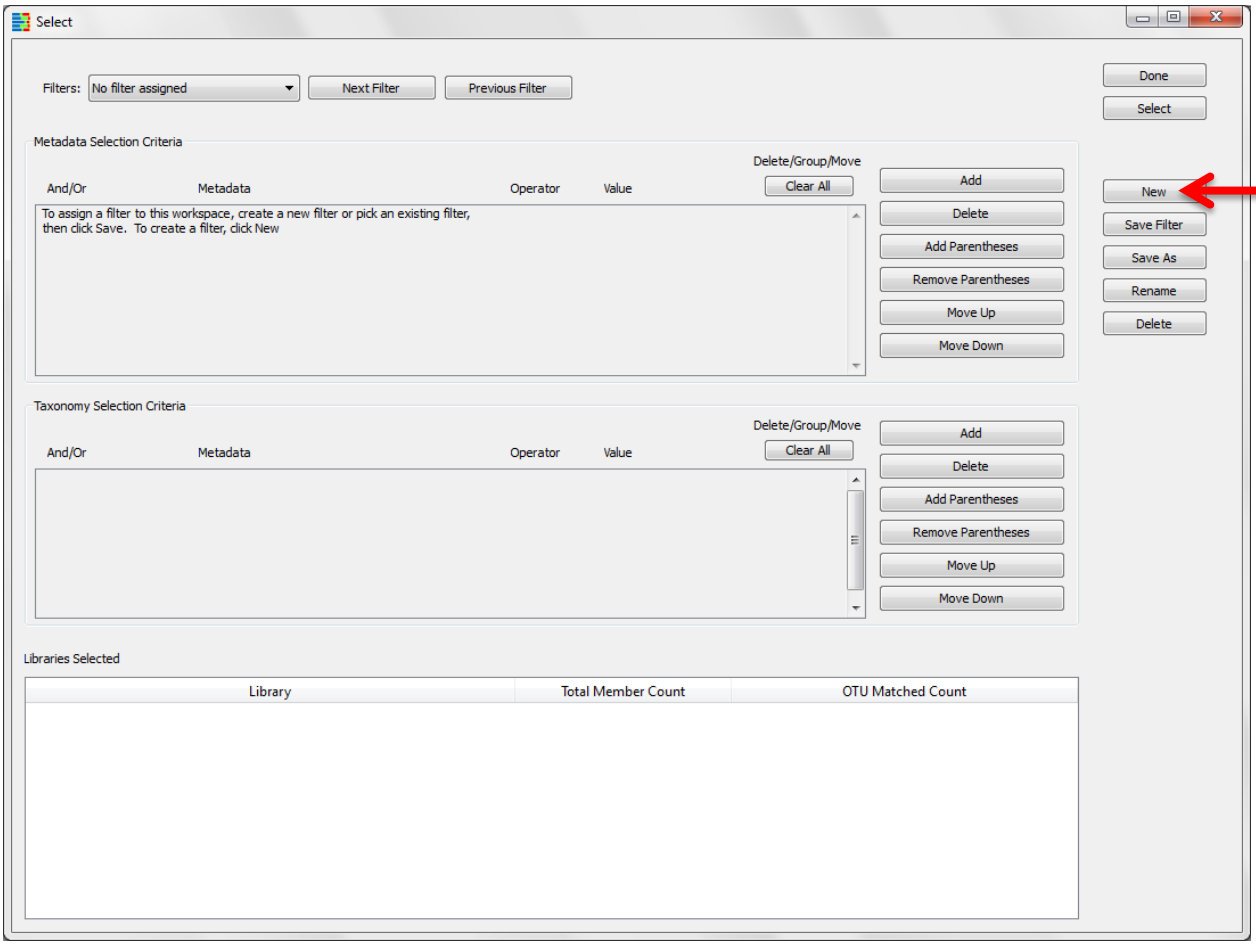
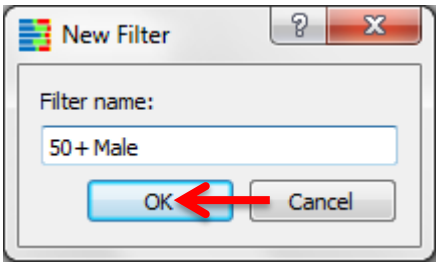


Enter desired filter name in the pop-up window

Click **OK**



The filter name will appear in upper left corner of window

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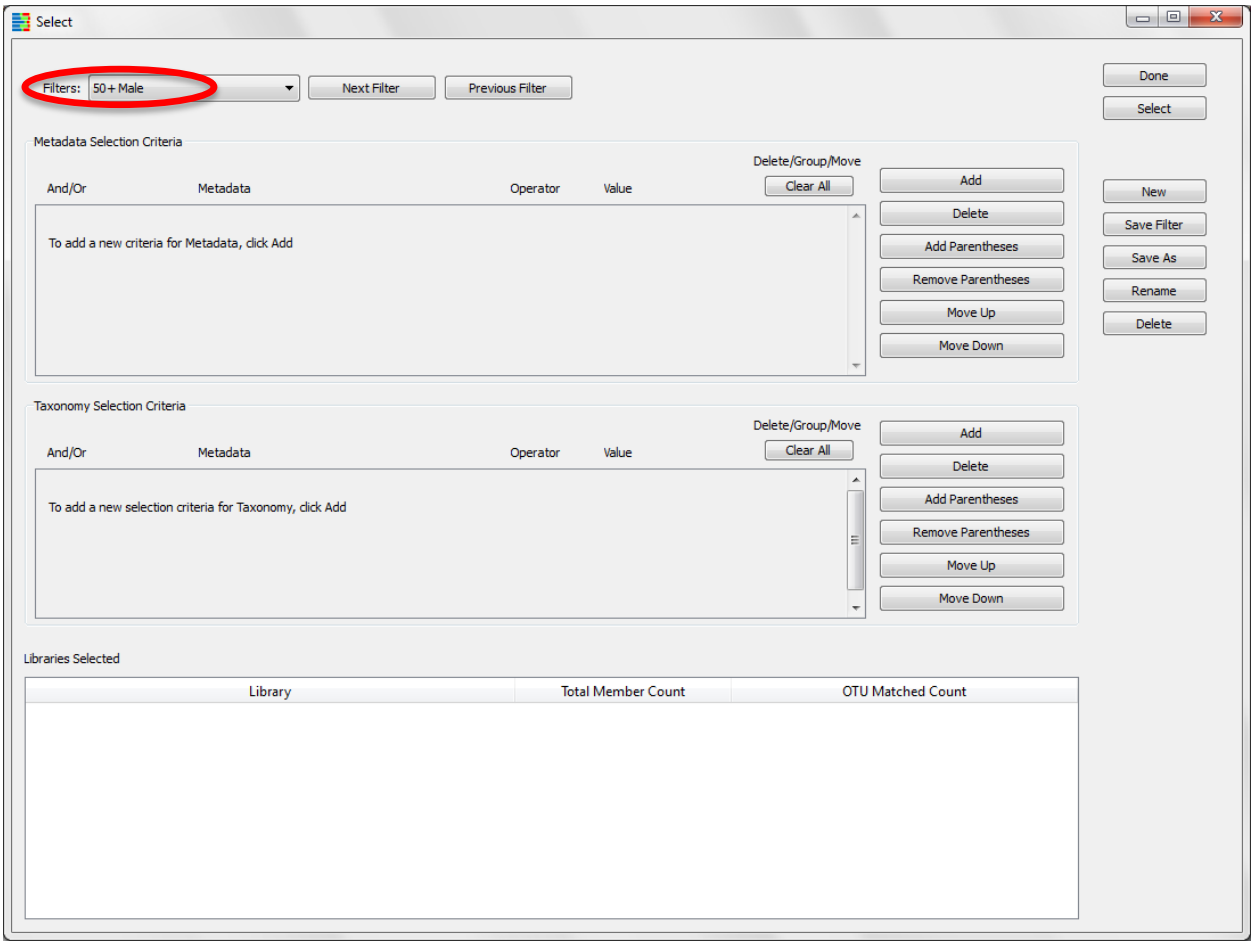

Now that we have created a new filter, we need to set up the parameters to filter by. We will select for all libraries that were sampled from a “Male” older than “50”.

B. Set Up the Filter Parameters

Click **Add** in the **Metadata Criteria** pane

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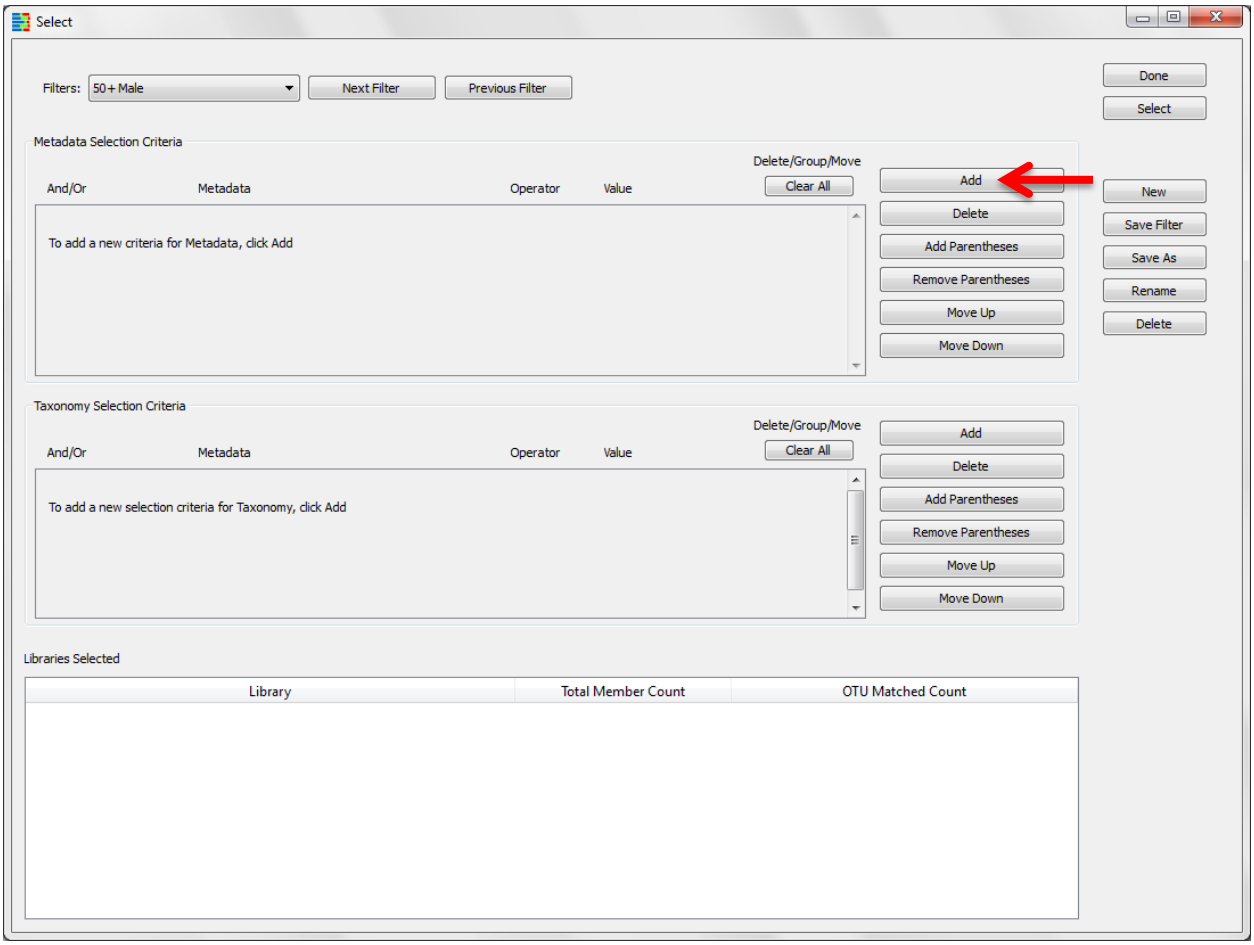

Use the first pull-down menu to select “Sex” (**Metadata** to filter by)
Use the second pull-down menu to select “equals” (filter **Operator**)
Enter “Male” into **Value**

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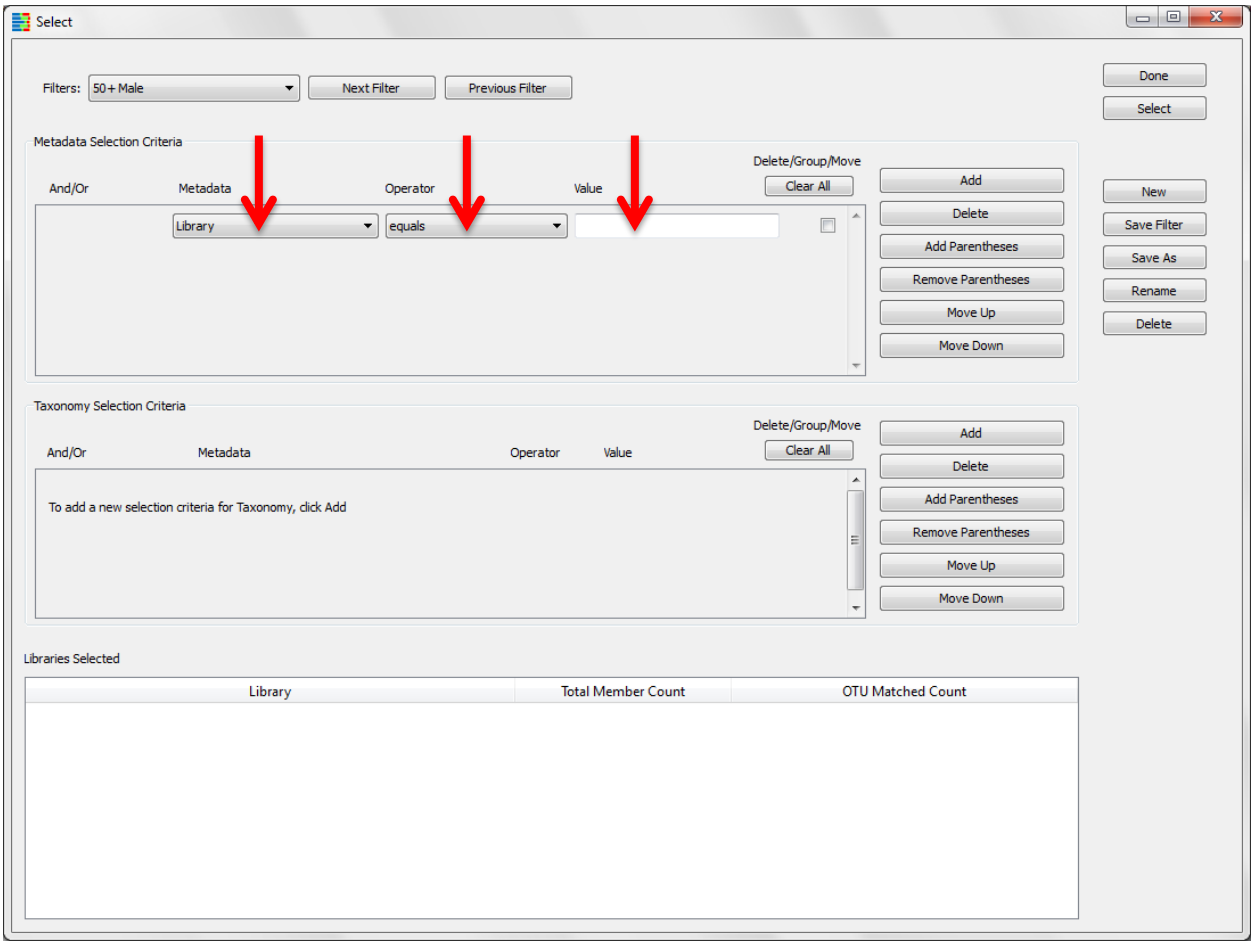

Click **Add** in the **Metadata Criteria** pane

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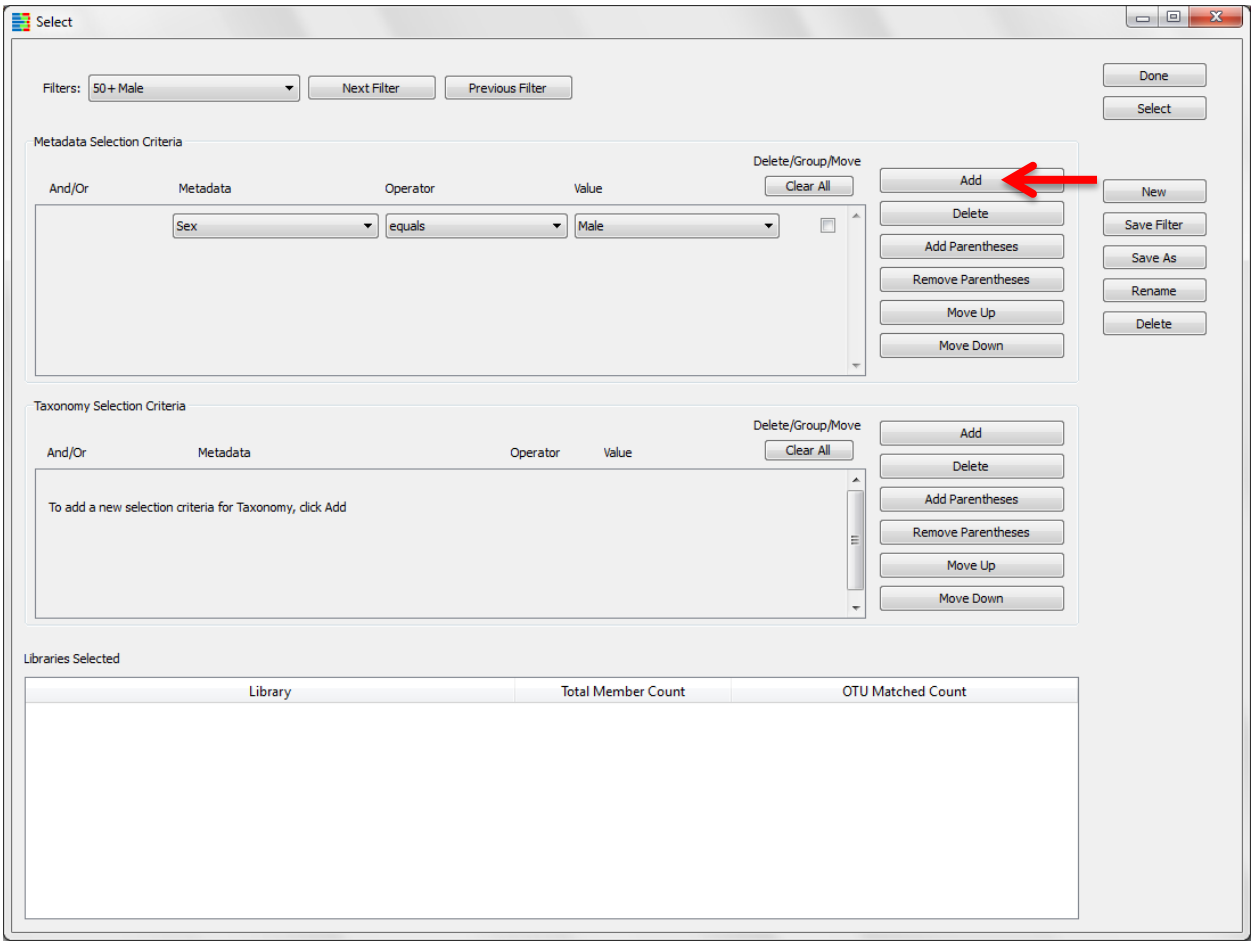

Use the first pull-down menu to select “And”
Use the second pull-down menu to select “Age” (**Metadata** to filter by)
Use the third pull-down menu to select “greater than” (filter **Operator**)
Enter “50” into **Value**

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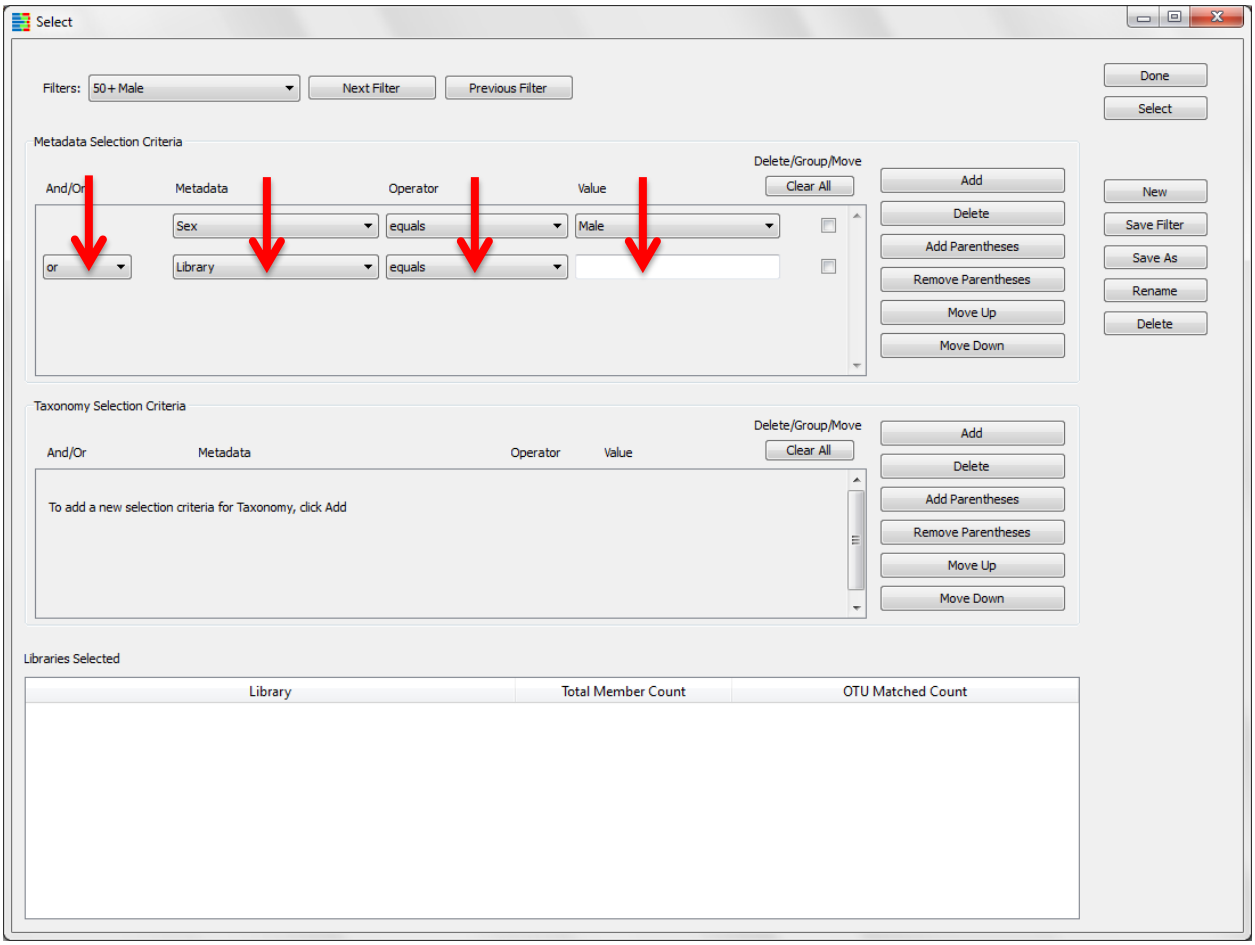

To apply filter, click **Select** in upper right corner of window
Click **Save Filter** on far right side of window to keep the filter

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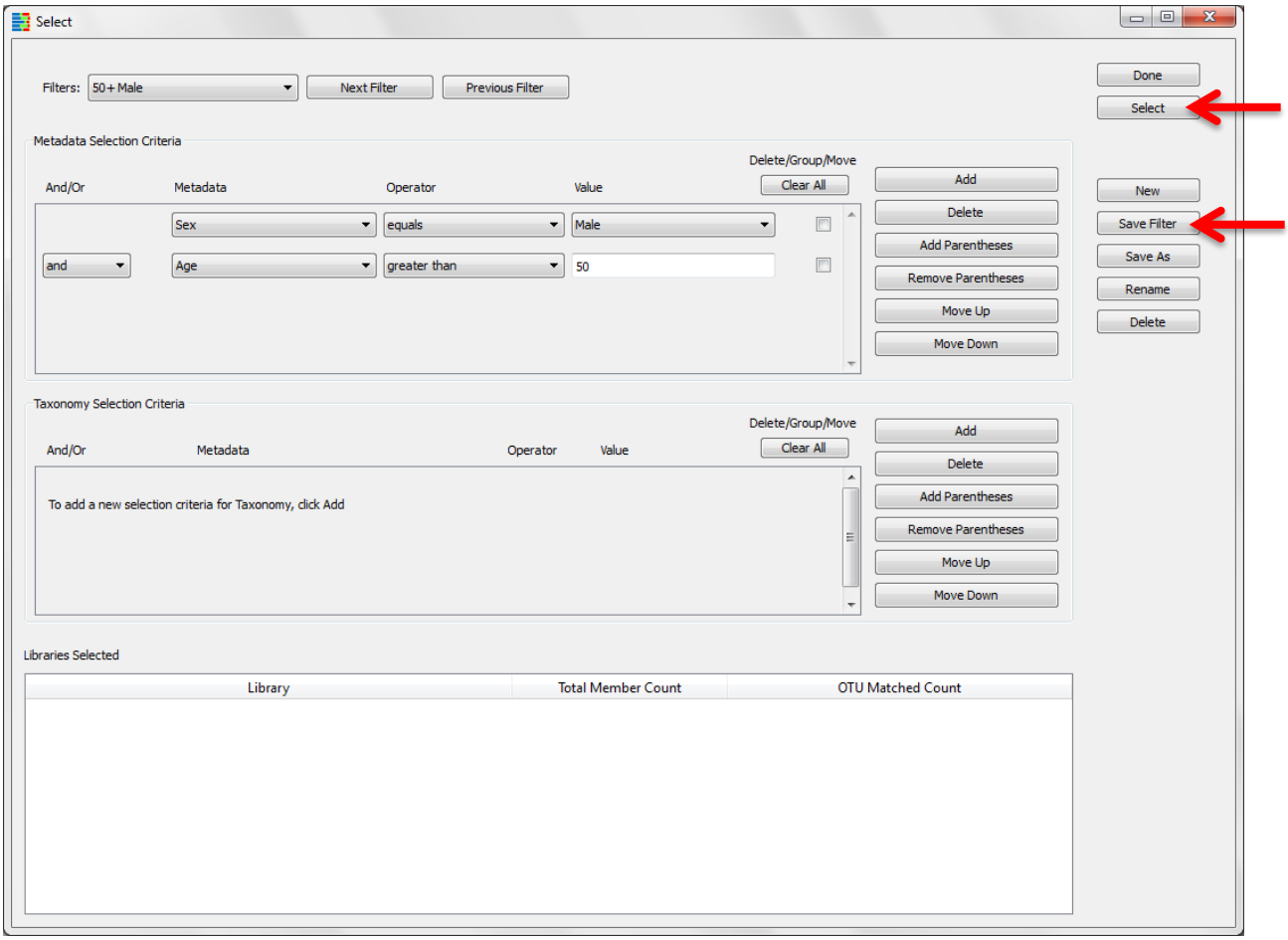

We now see that there are 6 libraries in our project which were sampled from males over the age of 50, and if desired, we can continue running mini-experiments on this subset of the libraries (as demonstrated in the basic tutorial).

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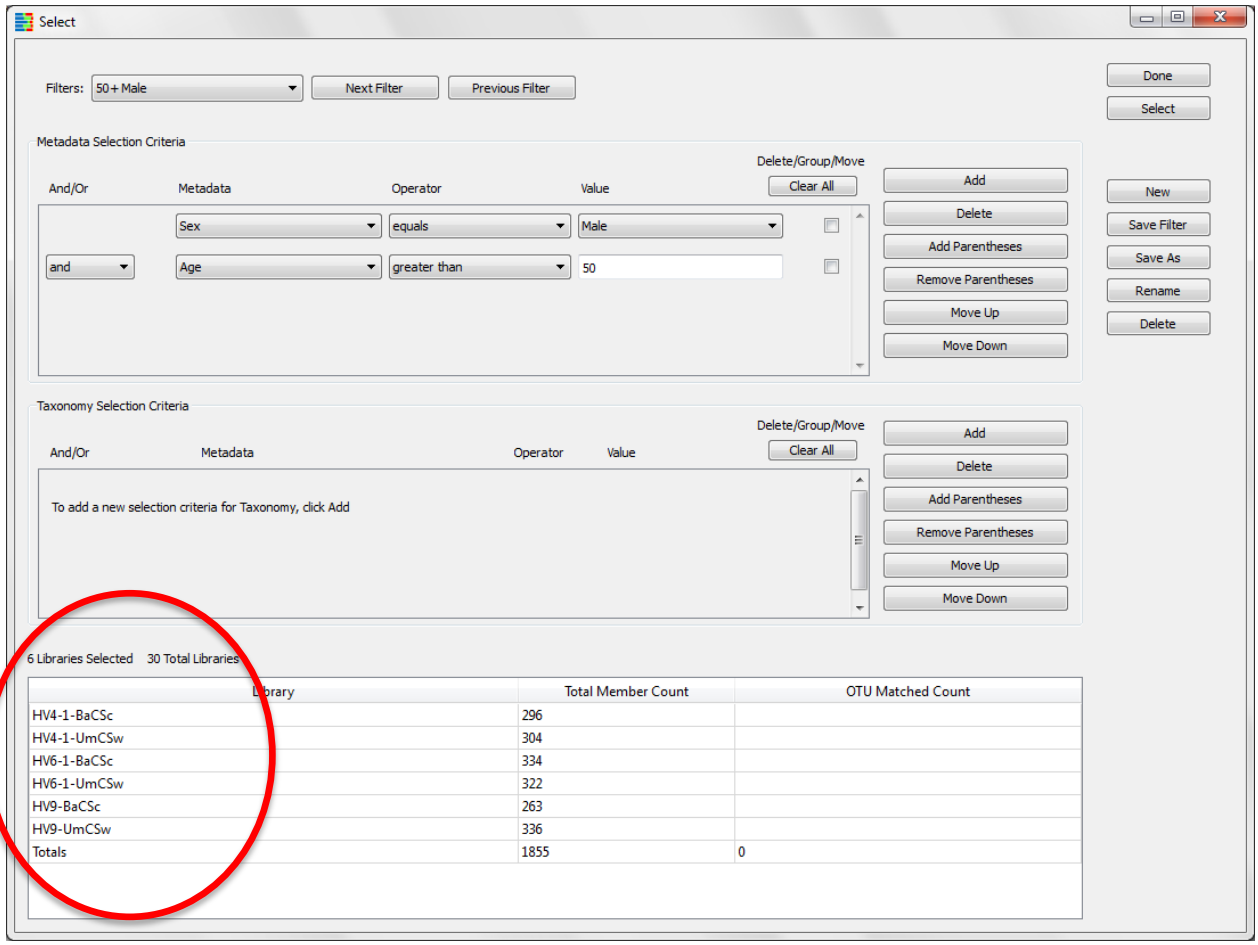

Click **Done** to return to the “Workspace 1” window

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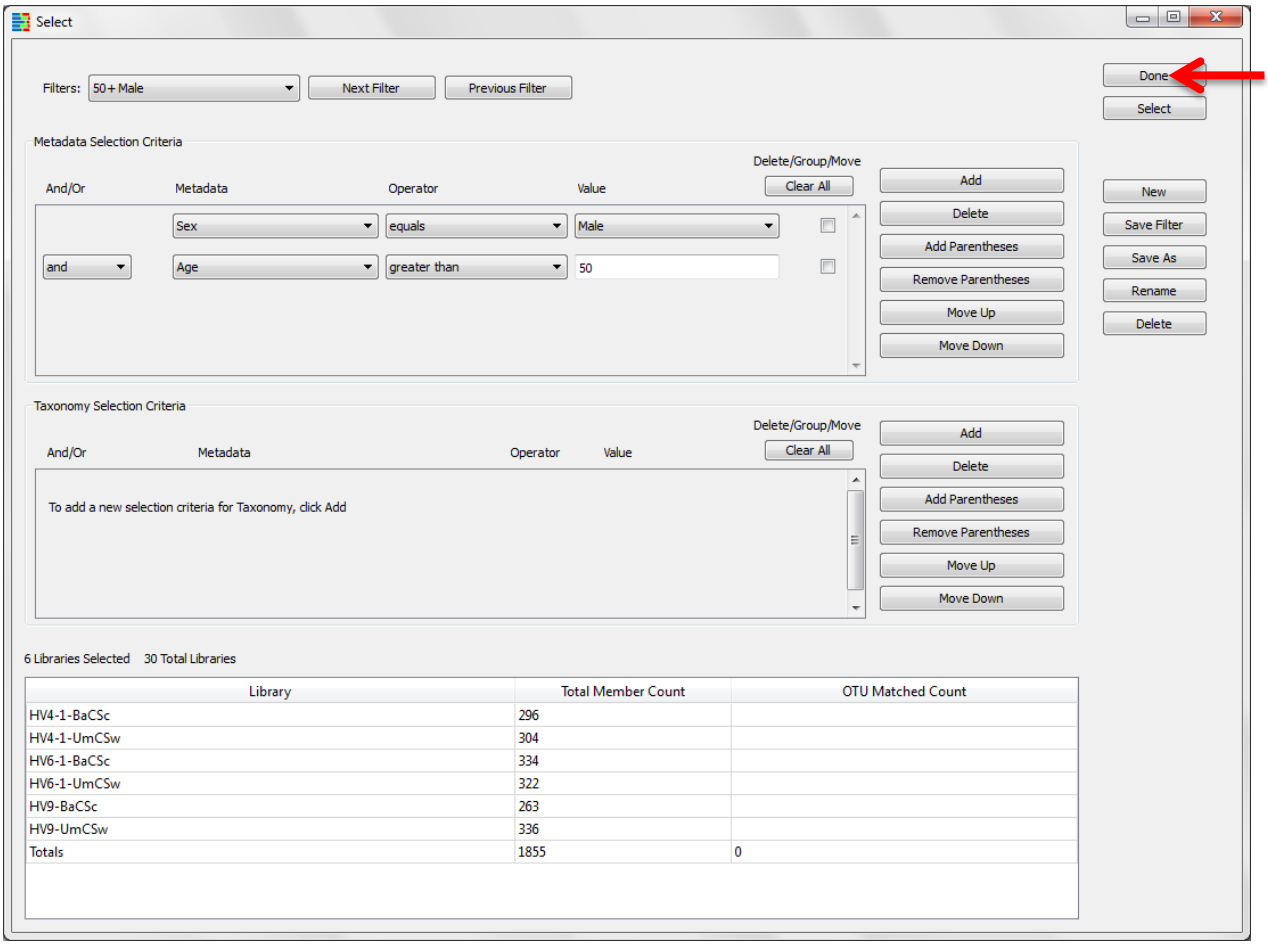

Remember to always click **Save** to keep the changes to the project!

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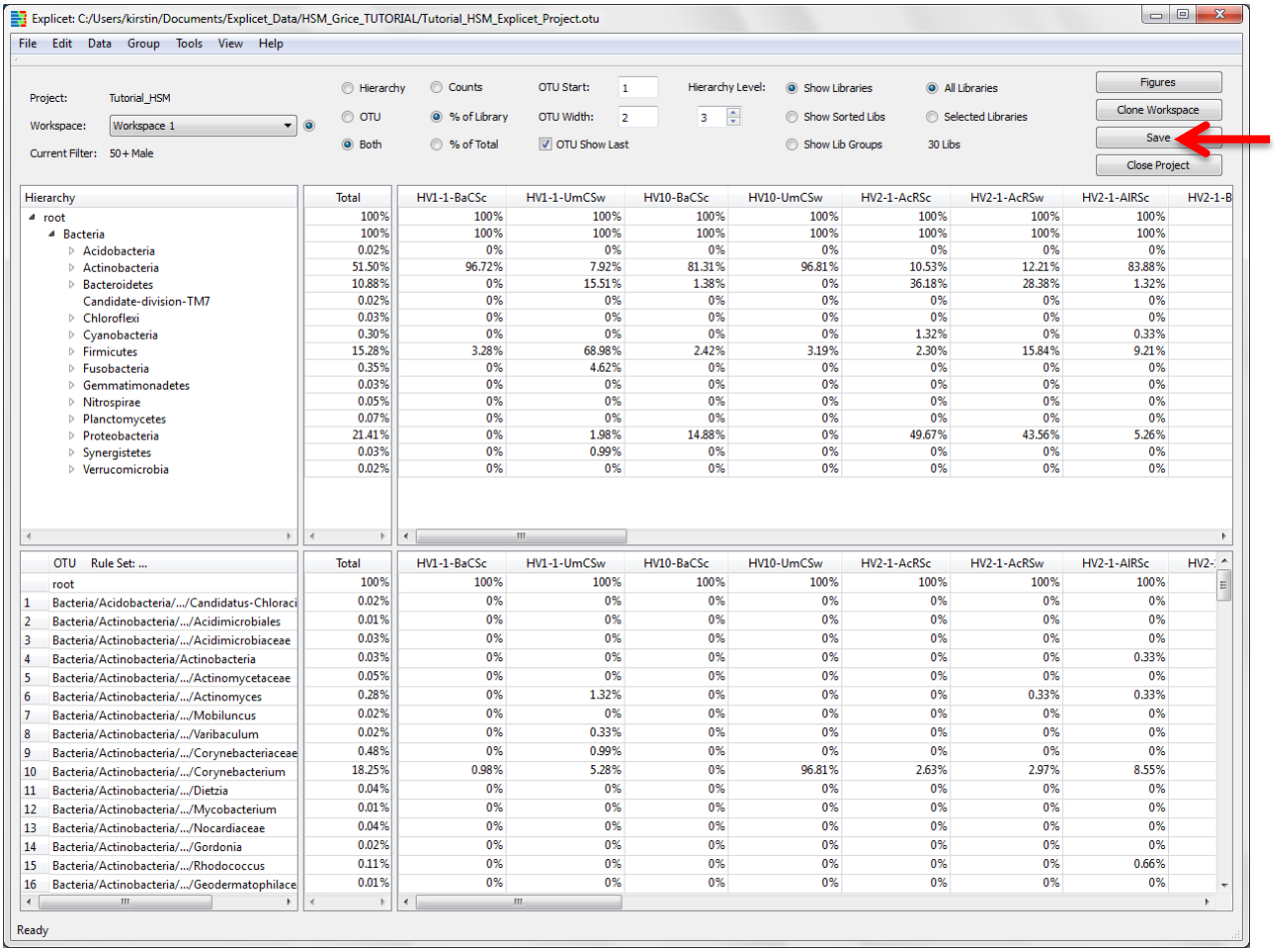

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