Database Programming Project

Team 3: Xufang Deng, Sean Higgins, Yukimura Otake

Laboratory Management System

- What is organization for whom this project is being developed?
  - ➢ Research laboratories

- What's the purpose and scope of this project?
  - ➢ Improving documentation, reporting, and communication, etc.

- Who are the users of the project?
  - ➢ laboratory personnel: Principal Investigator, Scientists, Lab manager

Laboratory personnel relationship

Lab manager
Role: management, coordination

Supervise

Report

Coordinate

Request

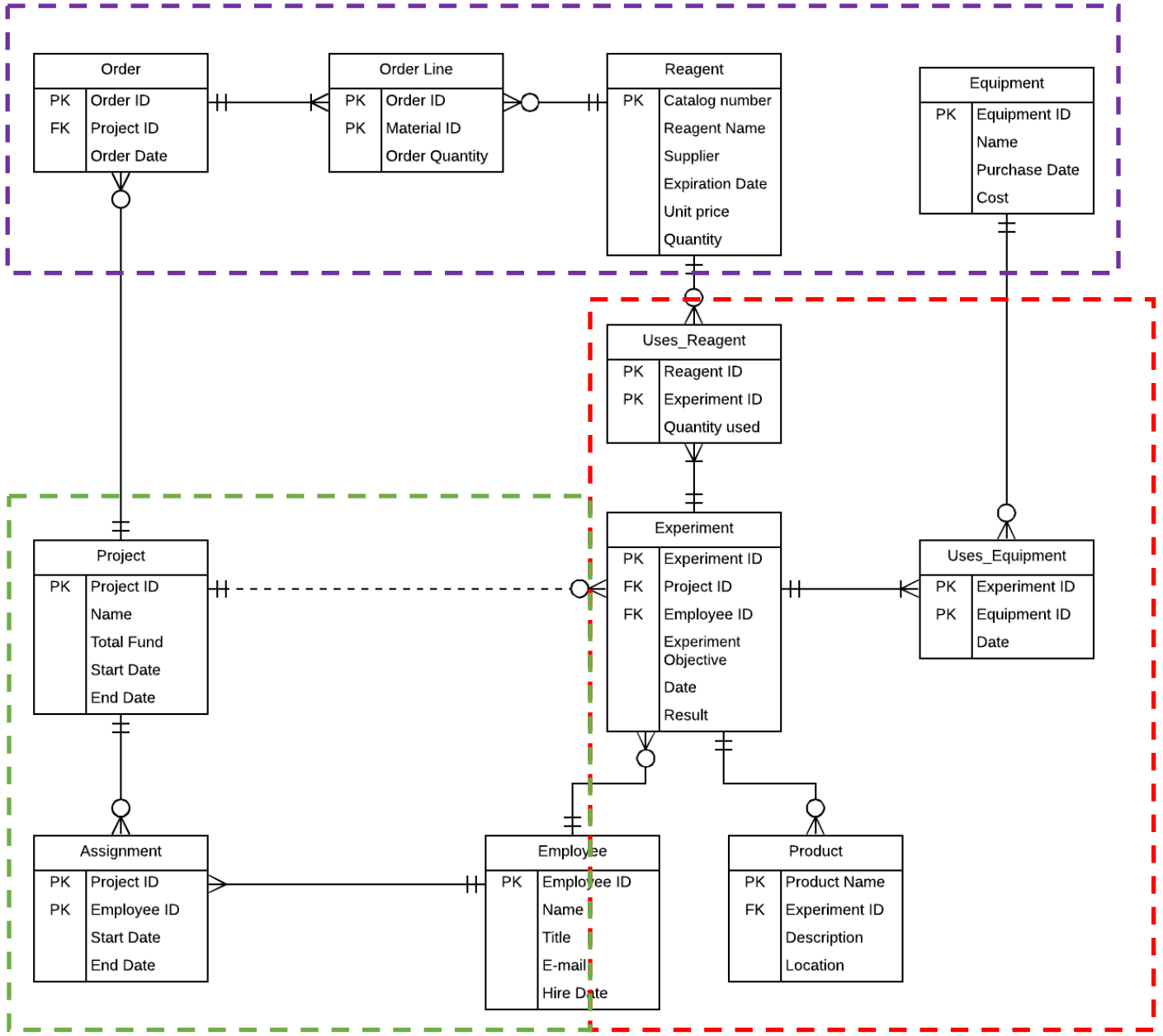
Supervise

Report

Principal Investigator (PI)
Role: Obtain fund, oversight

Scientists
Role: conduct research, report

Laboratory Management System



Green: PI
Purple: Lab manager
Red: Scientist

Laboratory Database in phpMyAdmin

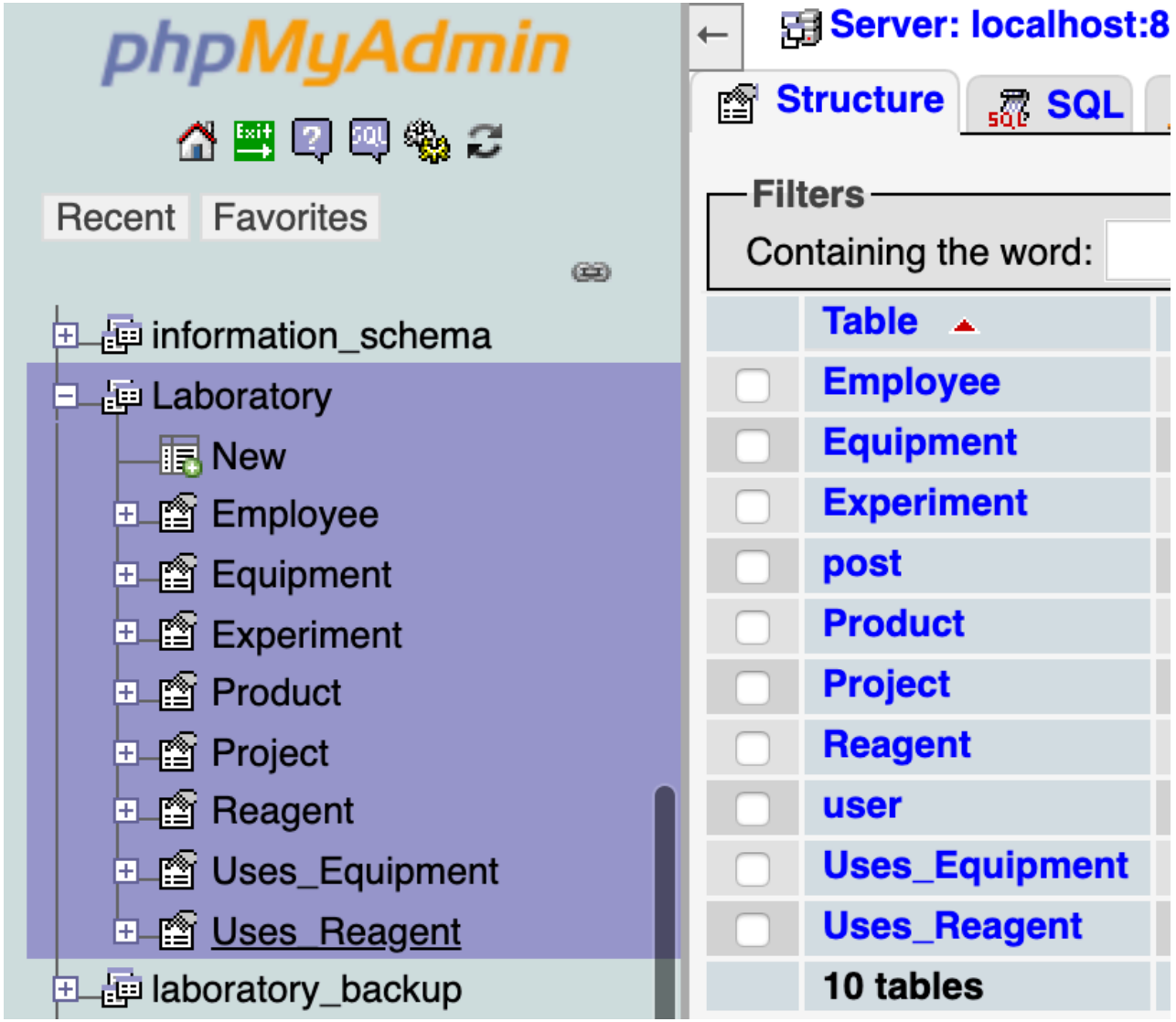


Table structure and Relation view of Experiment table

Table structure | Relation view

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	**experiment_ID**	char(4)	utf8_general_ci		No	*None*			Chan
☐	2	**project_ID**	char(8)	utf8_general_ci		No	*None*			Chan
☐	3	**employee_ID**	int(9)			No	*None*			Chan
☐	4	**experiment_Objective**	varchar(100)	utf8_general_ci		No	*None*			Chan
☐	5	**date**	date			No	*None*			Chan
☐	6	**results**	text	utf8_general_ci		Yes	*NULL*			Chan

Check all *With selected:* Browse Change Drop Primary Unique Index Fulltext

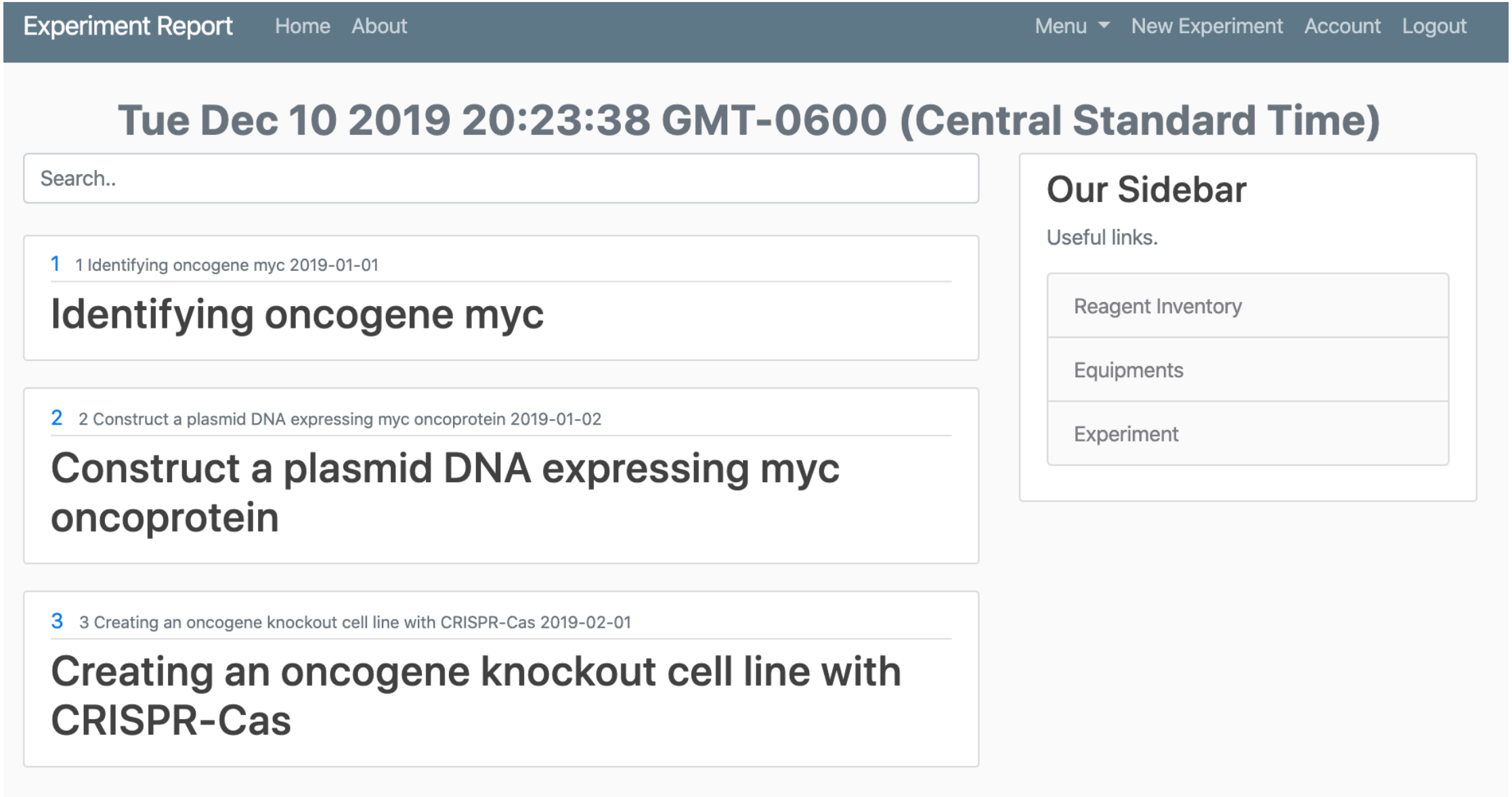
Print Propose table structure Move columns Normalize

Add 1 column(s) after results Go

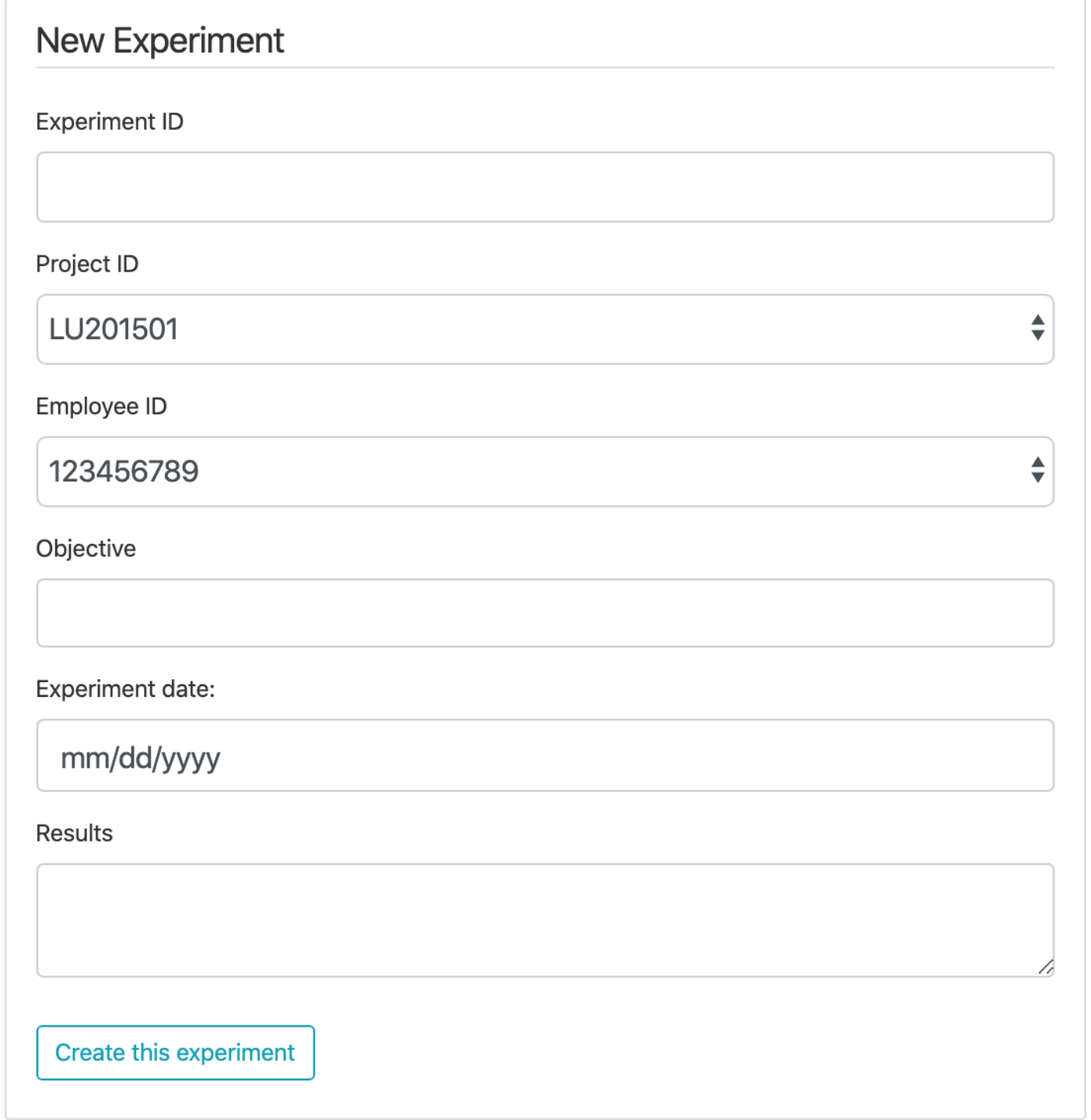
Indexes

Action		Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit	Drop	**PRIMARY**	BTREE	Yes	No	experiment_ID	3	A	No	
Edit	Drop	**Employee ID**	BTREE	No	No	employee_ID	3	A	No	
Edit	Drop	**project ID**	BTREE	No	No	project_ID	3	A	No	

Homepage


Experiment Report
Home
About
Menu
New Experiment
Account
Logout
Tue Dec 10 2019 20:23:38 GMT-0600 (Central Standard Time)
Search..
1 1 Identifying oncogene myc 2019-01-01
Identifying oncogene myc
2 2 Construct a plasmid DNA expressing myc oncoprotein 2019-01-02
Construct a plasmid DNA expressing myc oncoprotein
3 3 Creating an oncogene knockout cell line with CRISPR-Cas 2019-02-01
Creating an oncogene knockout cell line with CRISPR-Cas
Our Sidebar
Useful links.
Reagent Inventory
Equipments
Experiment

Create a new experiment



Create a new experiment

You have added a new experiment!

1 1 Identifying oncogene myc 2019-01-01

Identifying oncogene myc

2 2 Construct a plasmid DNA expressing myc oncoprotein 2019-01-02

Construct a plasmid DNA expressing myc oncoprotein

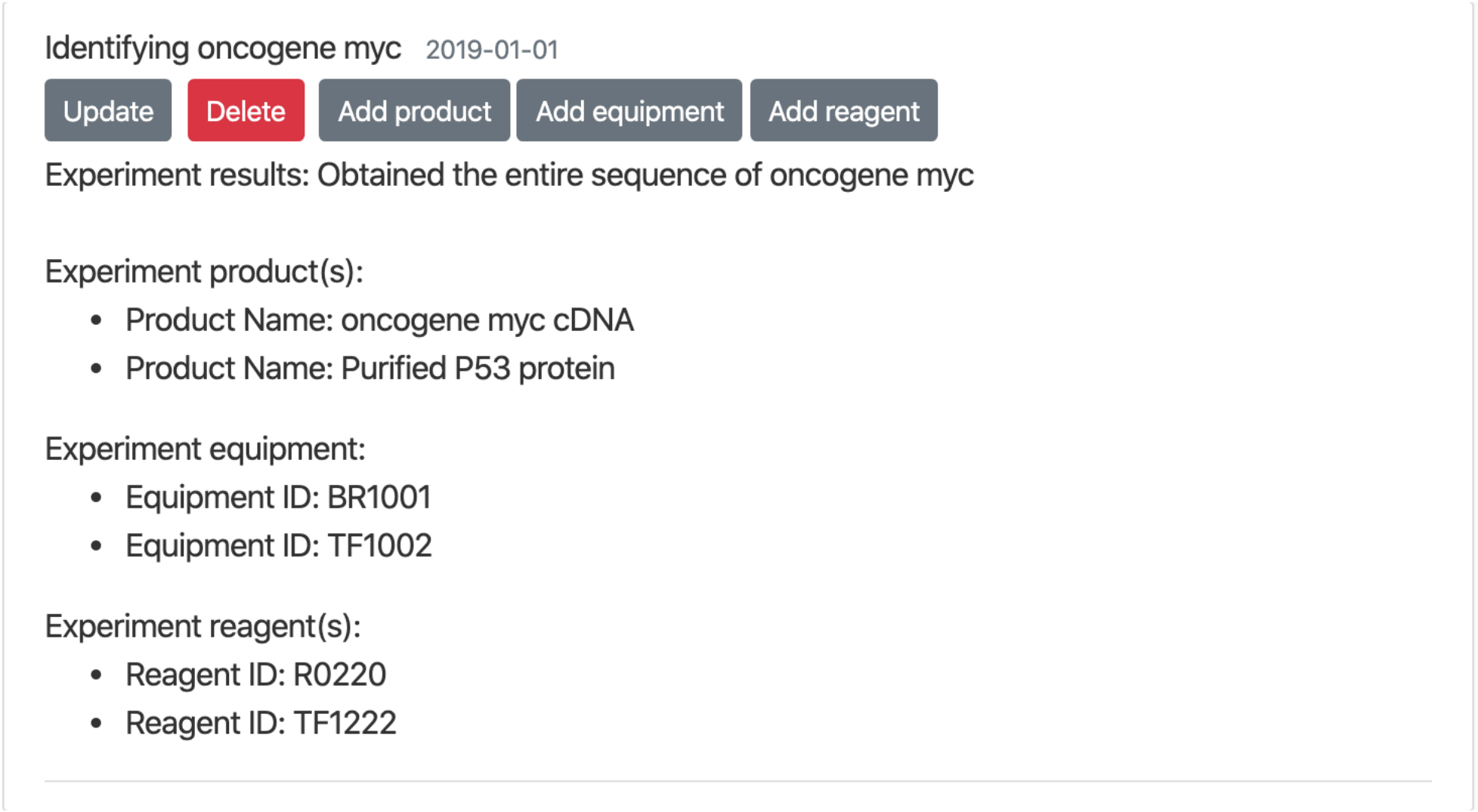
3 3 Creating an oncogene knockout cell line with CRISPR-Cas 2019-02-01

Creating an oncogene knockout cell line with CRISPR-Cas

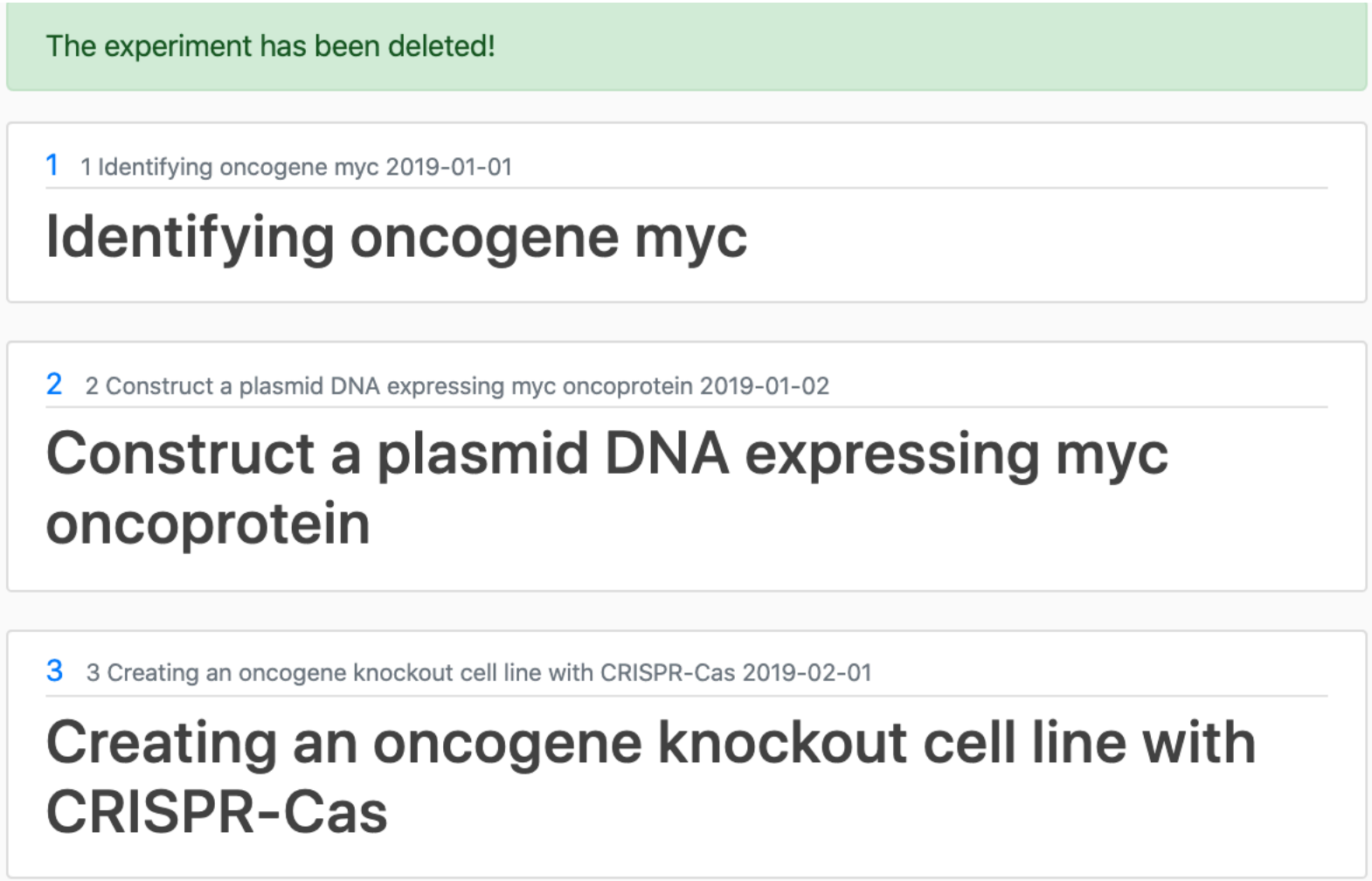
4 4 test1 2019-01-01

test1

Click individual experiment to display the details



Delete an experiment



Add a new product

You have added a new product!

Identifying oncogene myc 2019-01-01

Update Delete Add product Add equipment Add reagent

Experiment results: Obtained the entire sequence of oncogene myc

Experiment product(s):

- Product Name: oncogene myc cDNA
- Product Name: Purified P53 protein
- Product Name: test Name

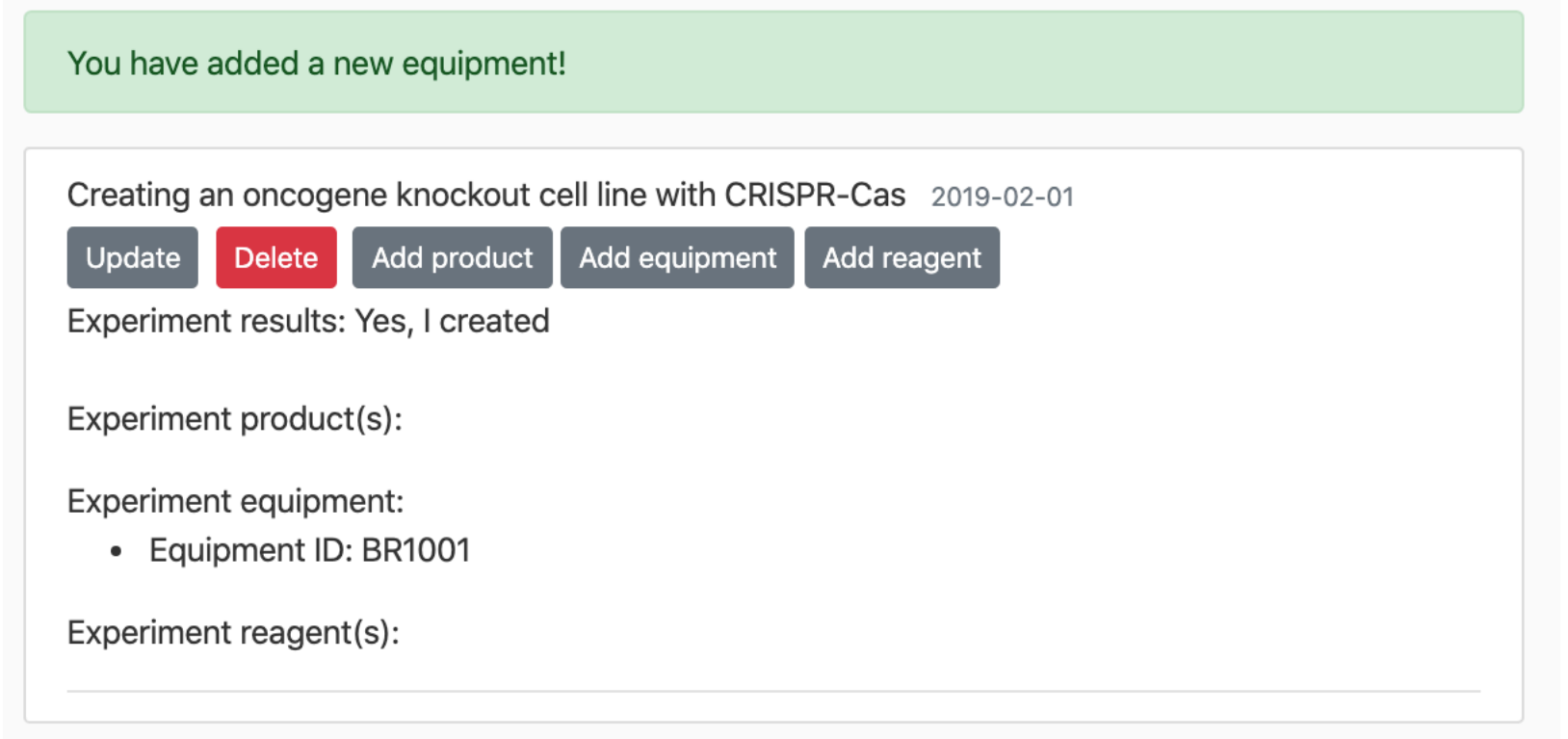
Experiment equipment:

- Equipment ID: BR1001
- Equipment ID: TF1002

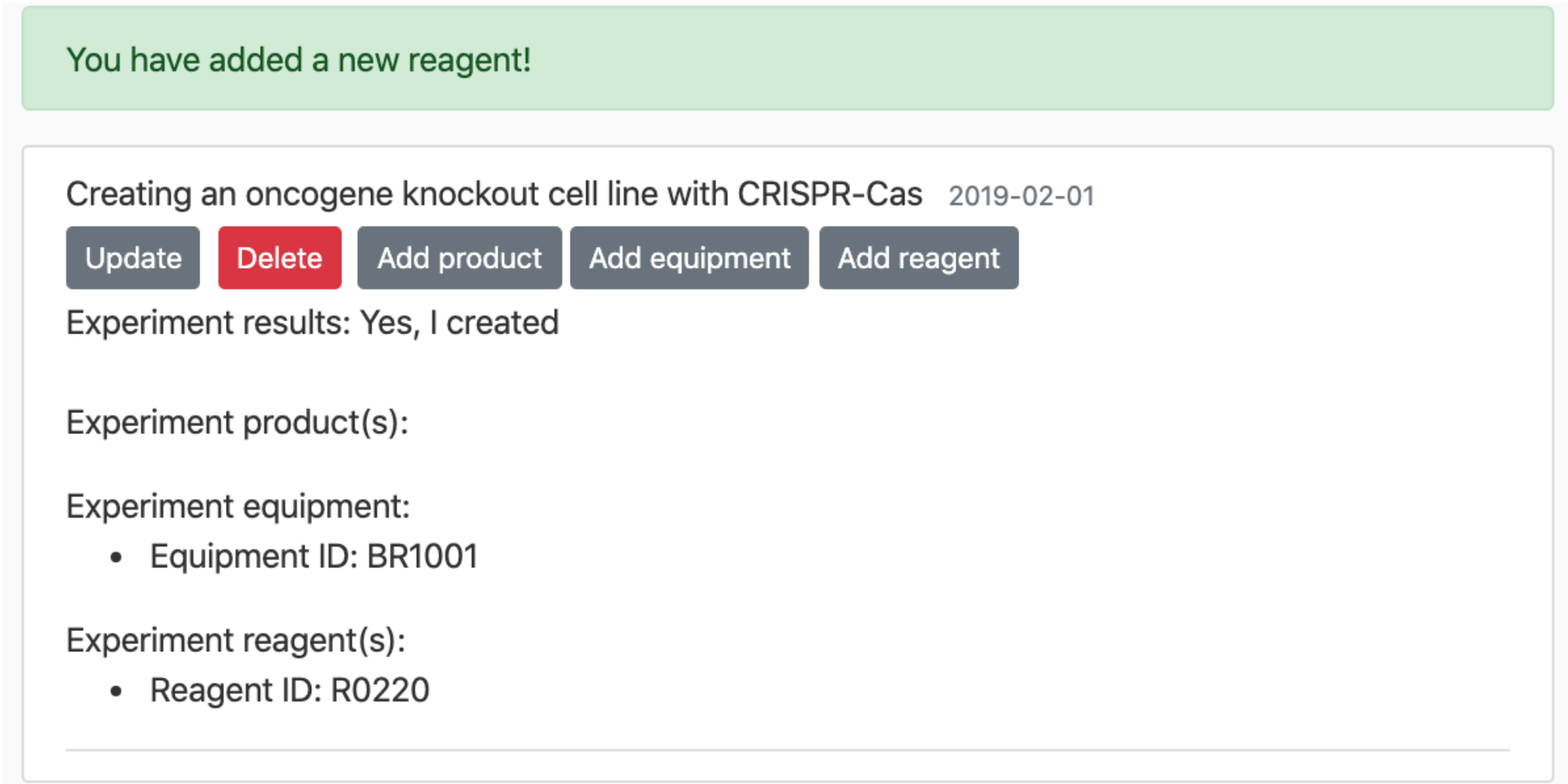
Experiment reagent(s):

- Reagent ID: R0220
- Reagent ID: TF1222

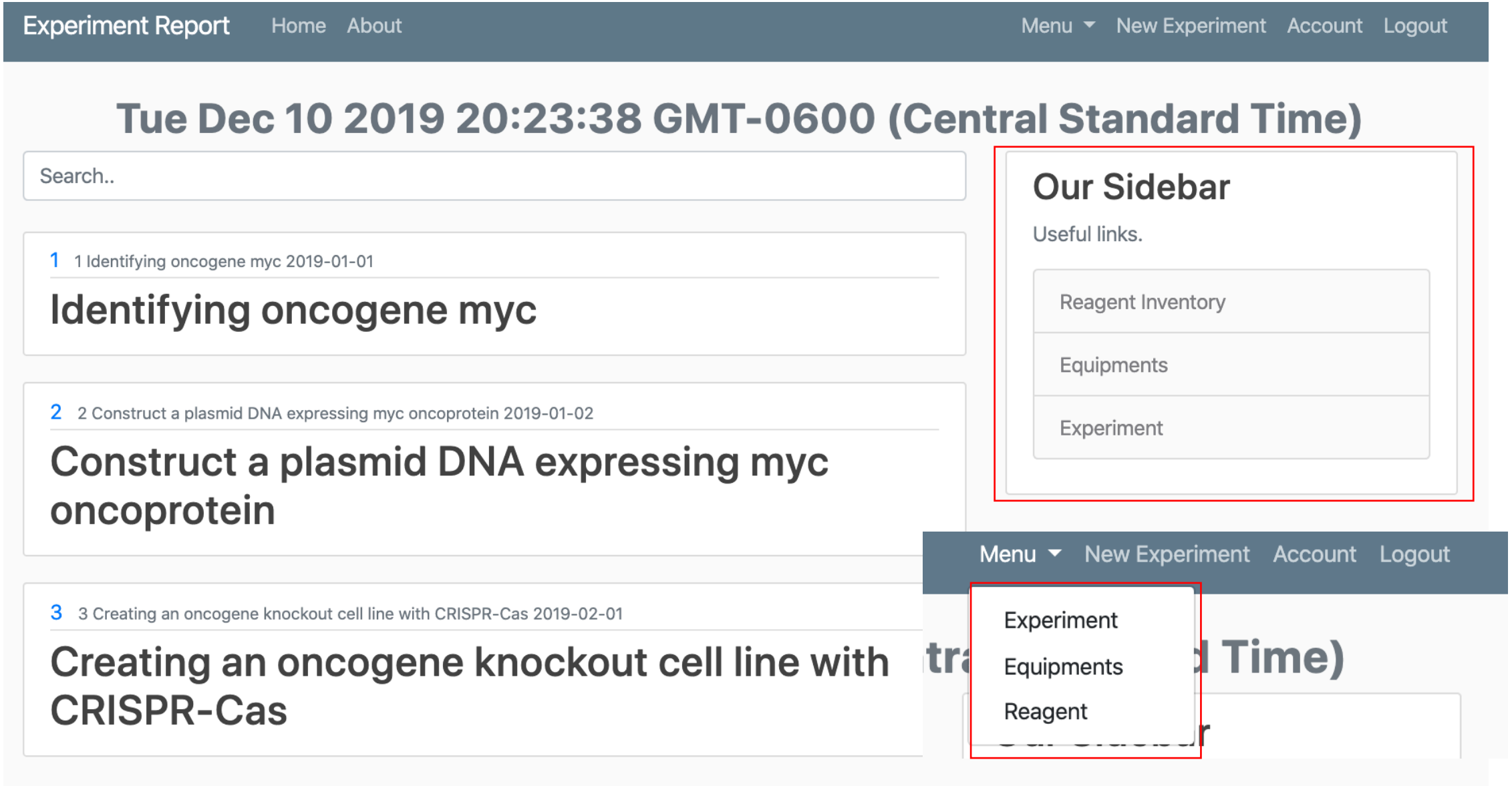
Add a new equipment



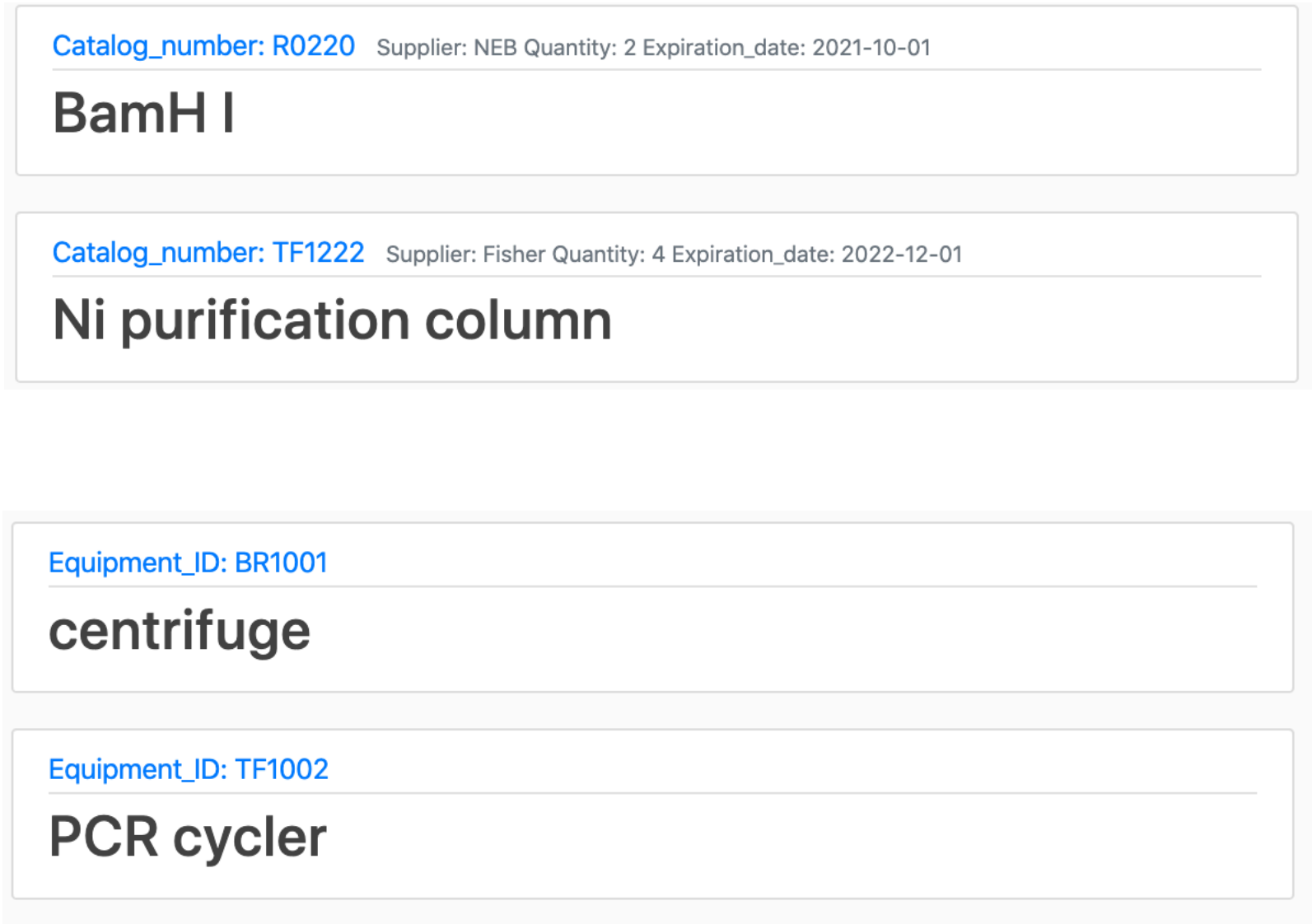
Add a new reagent



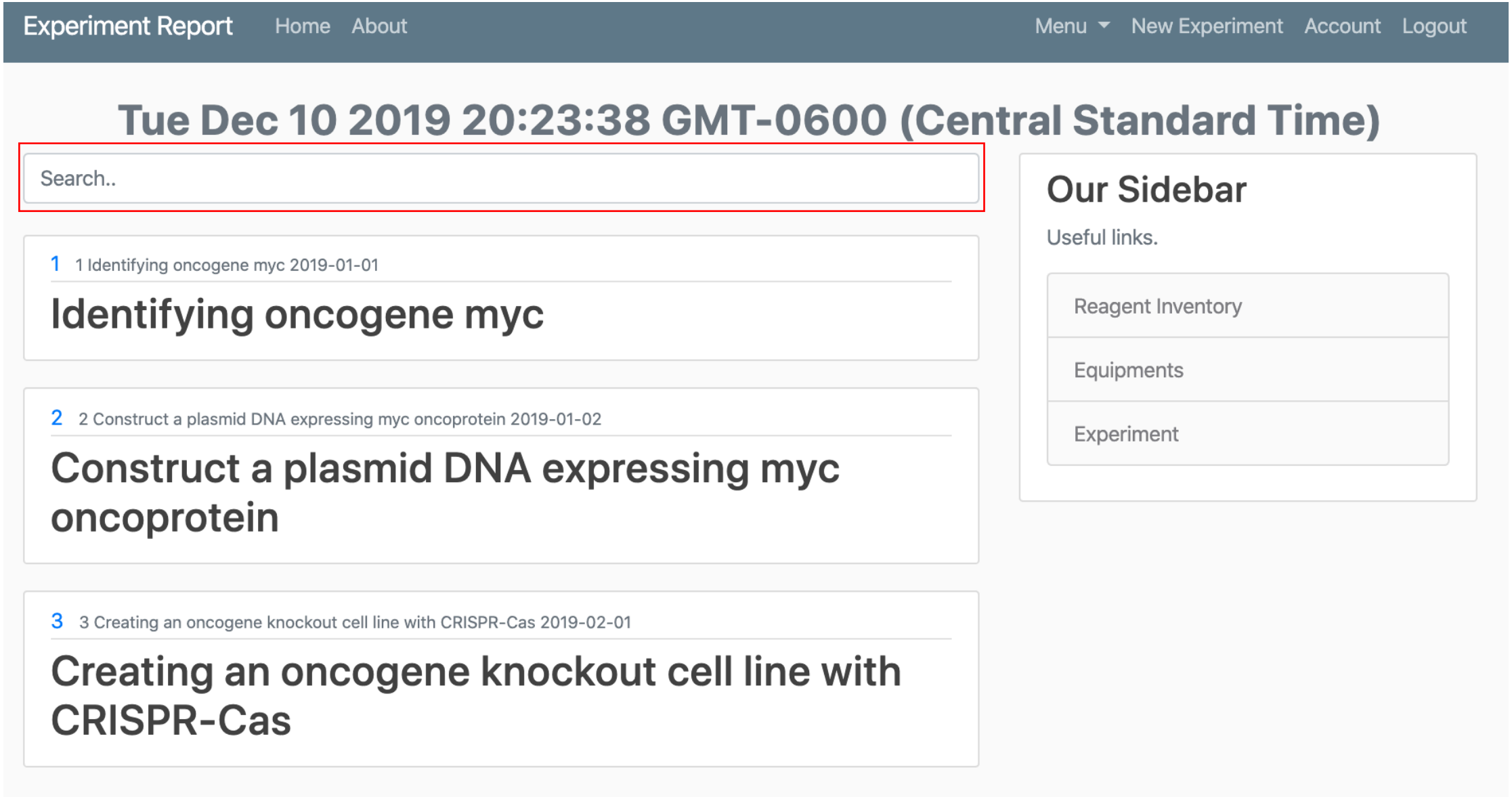
Additional useful links and dropdown menu on the homepage



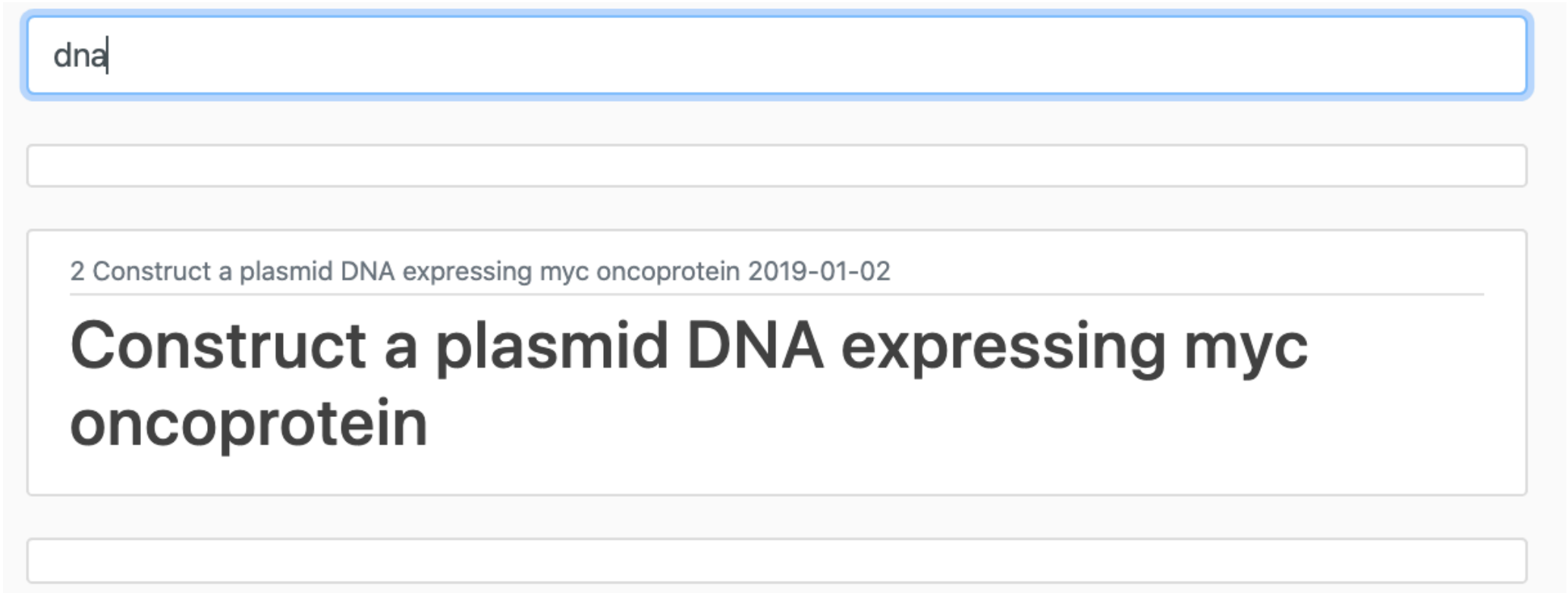
Look up inventory information is helpful for Scientists to choose what to use



Cool stuff!


Experiment Report
Home
About
Menu
New Experiment
Account
Logout
Tue Dec 10 2019 20:23:38 GMT-0600 (Central Standard Time)
Search..
1 1 Identifying oncogene myc 2019-01-01
Identifying oncogene myc
2 2 Construct a plasmid DNA expressing myc oncoprotein 2019-01-02
Construct a plasmid DNA expressing myc oncoprotein
3 3 Creating an oncogene knockout cell line with CRISPR-Cas 2019-02-01
Creating an oncogene knockout cell line with CRISPR-Cas
Our Sidebar
Useful links.
Reagent Inventory
Equipments
Experiment

Use search bar to search experiment



Code for the search bar

experiment_home.html

```
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.4.1/jquery.min.js"></script>
{% extends "layout_laboratory.html" %}
{% block content %}
<input class="form-control" id="myInput" type="text" placeholder="Search..">
<br>
    {% for row in outString %}
        <article class="media content-section" id="inputs">
          <div  class="media-body">
            <div class="article-metadata">
              <a class="mr-2" href="#">{{ row['experiment_ID'] }}</a>
              <small class="text-muted">{{ row['experiment_ID'] }}  {{ row['experiment_Objective'] }} {{row['date']}}</small>
            </div>
       <h2><a class="article-title" href="{{ url_for('expt', experiment_ID=row.experiment_ID)}}">{{ row.experiment_Objective }}</a></h2>
          </div>
        </article>
        <script>
            $(document).ready(function(){
              $("#myInput").on("keyup", function() {
                var value = $(this).val().toLowerCase();
                $("#inputs *").filter(function() {
                  $(this).toggle($(this).text().toLowerCase().indexOf(value) > -1)
                });
              });
            });
            </script>

     {% endfor %}
{% endblock content %}
```

Summary

- This application allows users (Scientists) to create, update, and delete an experiment
- Add additional info (reagent, equipment, etc.) to an experiment
- Allow to search experiments

This application 1) facilitate and motivate scientists to document their work; 2) make it easier for them to report; 3) also helpful for lab management, etc.

Future work

- Improve the display of each experiment;
- Create a request page so that Scientists can inform Lab manager to order items, etc.
- Complete the application for Principal investigator (PI), so PI can track the progress of each project
- Complete the application for Lab manager, so s/he can track inventory and manage the use of equipment