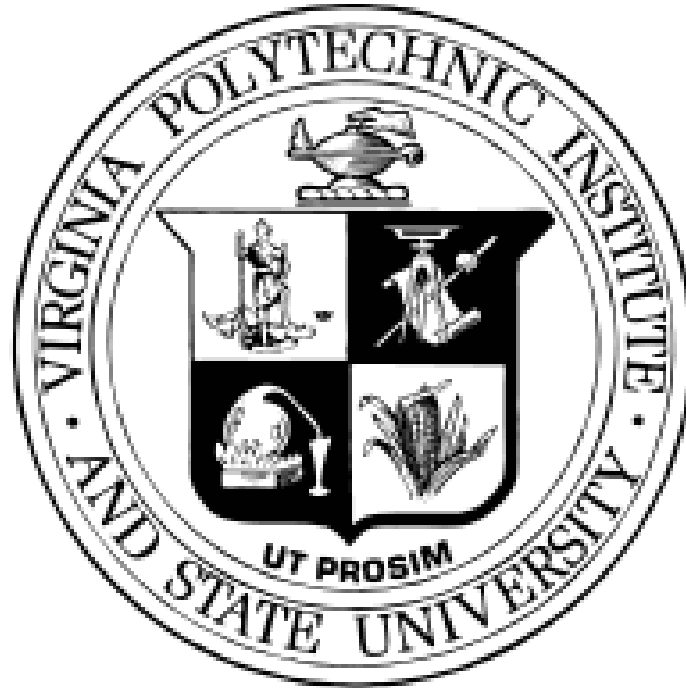


Drug Discovery Website Redesign

Final Project Report



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1. Executive Summary

The client, Karen Iannaccone, designed, developed, and maintained a website for the Virginia Tech Center for Drug Discovery. Virginia Polytechnic Institute and State University ceased the operations of a Percussion Content Management System in favor of a new system based on the Ensemble Content Management System. Karen Iannaccone does not have strong technical background and therefore requested a new website be created with an emphasis on three design goals:

- Maintainability
- Performance
- Usability

WordPress, along with the Avada theme, allows for a responsive and intuitive site to be designed, developed, and maintained efficiently and inexpensively. Karen Iannaccone requested we develop a WordPress website to allow her to learn through tutorials in a much simpler setting. Virginia Tech Hosting set up a sandbox environment where the team could develop and refine the WordPress website while not affecting the old website created by the client.

As a team, we went through the content of the old website and utilized a web crawler to determine all linking throughout the website. We created a list of web pages that needed to be migrated, and split the list of pages amongst team members. After determining the workload, we designed the website to allow for a better user experience. We delivered an entire website consisting of informational pages, donation page, and image galleries to deliver all of the old content on the new website.

Before the WordPress was launched, the client critiqued the website and provided initial feedback on text, images, page layouts, and navigation, which was corrected, refined, and resubmitted to the client. Karen Iannaccone approved the site and it was launched March 30th.

After the site's launch, it was tested by third party users for acceptance and usability and by GTMetrix.com for performance. Feedback from test participants has been consolidated and given to the client in order to address any further revisions that can be made. The performance metrics will be analyzed and the website's performance will be improved.

2. Introduction

We are performing a website migration and redesign for the Virginia Tech Center for Drug Discovery (VTCDD), an organization that is pioneering research in drug discovery at Virginia Tech. Our clients are requesting that it is backed by a content management system that is usable and heavily supported by third party developers.

2.1. Goals and Objectives

The VTCDD has asked us to modernize their website. To do this, we will create a brand new WordPress website, utilizing a highly customizable theme to provide flexible design options for user content. We will be moving all existing content into the new WordPress site, and establishing guidelines on how to create new content.

2.2. Statement of Scope

The scope of this project includes several essential requirements, a few desirable, and several future requirements.

Essential:

- Must use WordPress.
- Must have all existing content from the old website on the new website.
- Must have a donate option.
- Must include links to College of Science and the Fralin Institute.
- Must have links to publications and patents for faculty members.
- Must have documentation on how to use the content management system.

Desirable:

- Should allow for professors to write blog posts.
- Should design a news post to allow for the client to create news updates.
- Should have site-wide bread crumbs to allow for easy navigation.
- Should have links to social media.

Future:

- Would like improved social media presence.
- Would like contact information improvements

2.3. Software Context

The goal of this software is to provide the Virginia Tech Center for Drug Discovery with a way of reaching and sharing their work with other research centers and prospective investors. We will be enabling the Drug Discovery Center to reach a larger audience, and help bring in more money and grants for their research, through improved flow of traffic and better presence on the web.

2.4. Major Constraints

The real constraint for this project is that we must be able to build a system that is not only easy to use, but one that our client is able to maintain by herself (though lacking many technical skills required to maintain a typical website). As a result, we are required to simplify our implementations of features. We must also fully document how to use and maintain the website for the foreseeable future.

2.5. Report Outline

Our report is centered on how users and developers will utilize our website. Section 3 focuses on the use of the website. We begin by describing the website and the purpose of the website for both users and members of VTCDD. We follow the description with the various types of users of our website and what their responsibilities entail. To wrap up section 3, we discuss how users can navigate to the various sections of the website such as how to access certain pages and what pages offer to users.

Section 4 covers our developer's manual, and focuses mainly on how we developed the website in a way that accommodates our client with respect to maintaining the project. The website utilizes a core builder called Fusion Builder which is explained in depth in the first part of section 4. We then go into how to use WordPress and accessing multimedia content such as images or videos. Once we have explained the basics we go into detail on how to edit and add content to each of the existing web pages. Once we thoroughly explain all the different pieces of content we use, we explain how to get in touch with VT Hosting, who provides all of the hosting services for Virginia Tech web pages.

After we finish explaining our developer's manual, we report the lessons we have learned while working on our project as well as future work that may need to be completed after this semester in Section 5.

In Section 6, we go into acknowledgements. This is where we thank the people that were critical in helping us be successful creating the new website for VTCDD. Without these individuals, we wouldn't have the opportunity to complete such a unique project for a fantastic organization. After our acknowledgements, we cite our references and begin the appendix sections.

Our appendices are documentation of our project as we progressed throughout the semester. Appendix A is the requirements and design aspect of our project, and works through our decision-making process and requirements engineering stages as we began to prepare the new website for VTCDD. Appendix B is the implementation report for the website, which goes into detail about how we created the website and discusses our progress as of the writing of that report. Prototyping, Refinement, and Testing is our Appendix C, which discusses how we refined the VTCDD website as well as how we conducted some testing to gain information about the performance and user experience of our website. Appendices D and E discuss how we separated the work for each group member, and what our feedback was from our product owner once we delivered our first iteration of the website.

3. User Manual

3.1. Website Description

The Virginia Tech Center for Drug Discovery (VTCDD) was established in the Virginia Tech College of Science. The field of research in drug discovery and delivery is ripe for exploitation by universities who can provide focused resources in the area. The changing landscape of drug discovery provides real opportunities for universities to make significant contributions to the process of drug discovery and delivery, provided that they can provide the intellectual, physical, and financial resources to capitalize on the situation. VTCDD was formed by Virginia Tech researchers who were already regarded as leaders in the drug discovery and delivery area, with more than \$29 million in current research support. Under the VTCDD, members are able to coordinate and strengthen programs, share resources, and position themselves for new funding opportunities. The new website aims to help the VTCDD get this message out, as well as make it easier for users to perform integral actions associated with the VTCDD.

3.2. User Roles and Responsibilities

The following list contains the various roles and responsibilities of the common users who will be accessing the VTCDD's website.

- User Seeking Information
 - Prospective students who are looking to partner with the VTCDD for research opportunities. Interested in research grants and information about upcoming events.
 - General users who are looking for information about the VTCDD. Could be looking to find information on staff and students or browse upcoming and past events.
- Donors
 - Prospective donors who are evaluating the VTCDD as a potential organization to provide a donation to. Would be looking to find statistics and information on the program, as well as where and what their options for donating are.
 - Determined donors who have decided to donate and will need to be able to easily reach the donation portal.

- VTCDD Employees
 - Website maintenance employee in charge of changing and updating the website when new content is required. Needs to have access to the WordPress admin section of the website in order to make changes to the website.
 - VTCDD staff who need to be able to evaluate the content and provide feedback and new content to be added to the website.

3.3. Website Navigation

- Users Seeking Information
 - Users seeking more general information about VTCDD will find the center’s mission statement, overview, member collaborations, useful links, and contact information all on the homepage.
 - Users seeking more information about the personnel breakdown of the VTCDD, it’s goals, and the steering committee, they would go to the “About us” page. This page gives the user a brief understanding of what the VTCDD is.
 - Users seeking more information about the screening labs associated with the VTCDD would hover over the “Screening lab” tab on the toolbar. Here they will find two pages; The VTCDDSL Compound Library, and VTCDDSL Instrumentation. As the name states the VTCDDSL Instrumentation page describes all instrumentation for high-throughput analysis and drug screening. Both pages supply the screening labs contact information.
 - Users seeking more information about the activities that the VTCDD has to offer, can click on the activities page. Here users will find photos and description of the various events that the VTCDD has to offer. At the bottom of the page users can look through galleries of photos from events in prior years.
 - Users seeking more information on the faculty members at the VTCDD should click the “Faculty Members” tab in the toolbar. Here users will find the list of faculty members in alphabetical order by last name. There are filters for what department faculty members work for that will change who is shown on the page.
- Donors

- Users seeking the ability to donate would first go to the home page, and then from there would click the “donate” tab at the top toolbar.

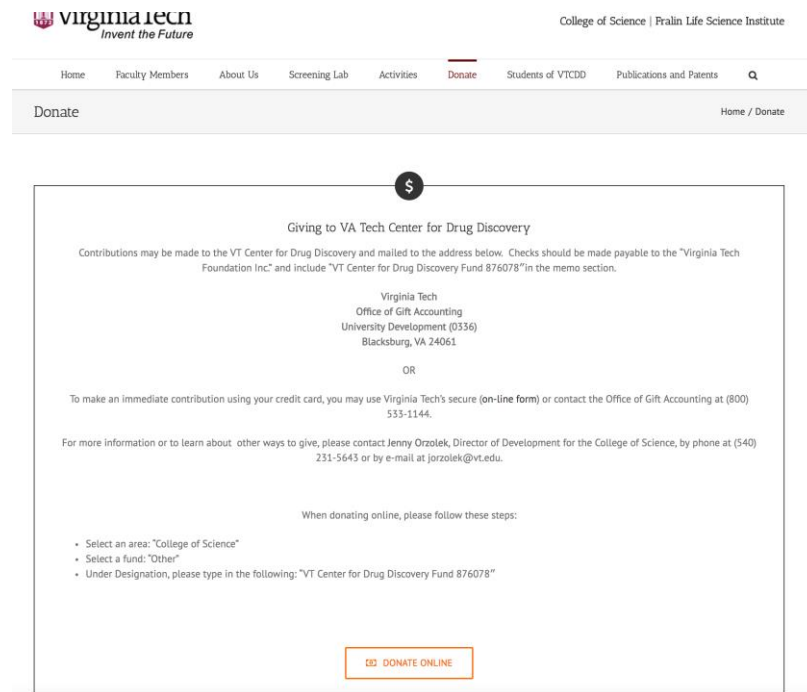


Figure 1 Donation Page for the VTCCDD

- Figure 1 shows the donate page that the user is then linked to. Here they receive information on the various ways to donate including, check, phone, and online. The “Donate online” button at the bottom redirects the user to Virginia Tech’s donation website.

4. Developer's Manual

4.1. How to Login to WordPress

1. Go to <http://www.vtcdd.science.vt.edu/wp-login.php>
2. Type in your username and password

4.2. Avada Fusion Builder Overview

The Avada theme comes with a nice tool to assist in styling and adding features to your pages. They have many pre-built pages which can give you some ideas of how to structure a page of your own. You can also import any of the pre-built pages and add/remove components to fit your needs. We will now go over a variety of the exciting things you can do when creating a page from scratch using the Fusion Builder.

1. First, create a new page by navigating to the “Pages” tab on the left navigation bar, then clicking “Add New” at the top left next to “Pages”, which is highlighted in Figure 2 below.

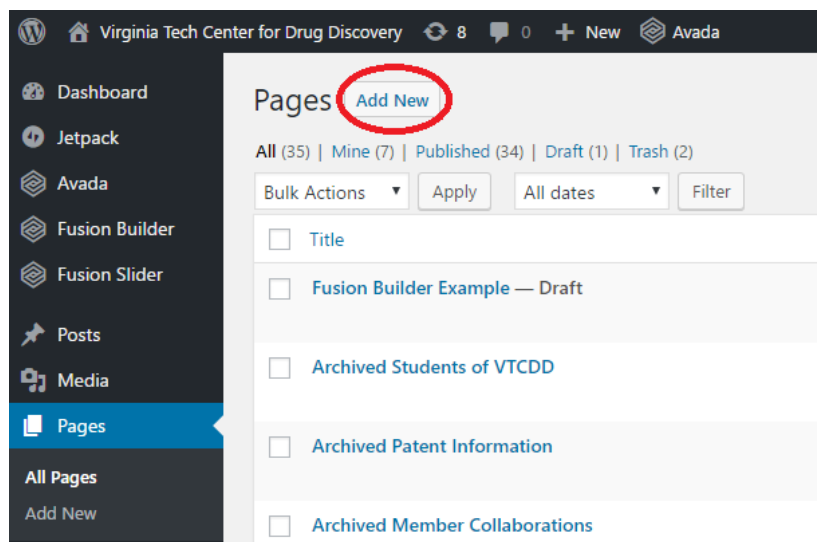


Figure 2 WordPress Add Page Button

2. You should now be on a page titled “Edit Page.” From here you should click on the “Use Fusion Builder” button in the top left corner, shown in Figure 3.



Figure 3 Avada Theme Fusion Builder Button

3. You will now see the window shown in Figure 4 appear below the “Use Fusion Builder” button.

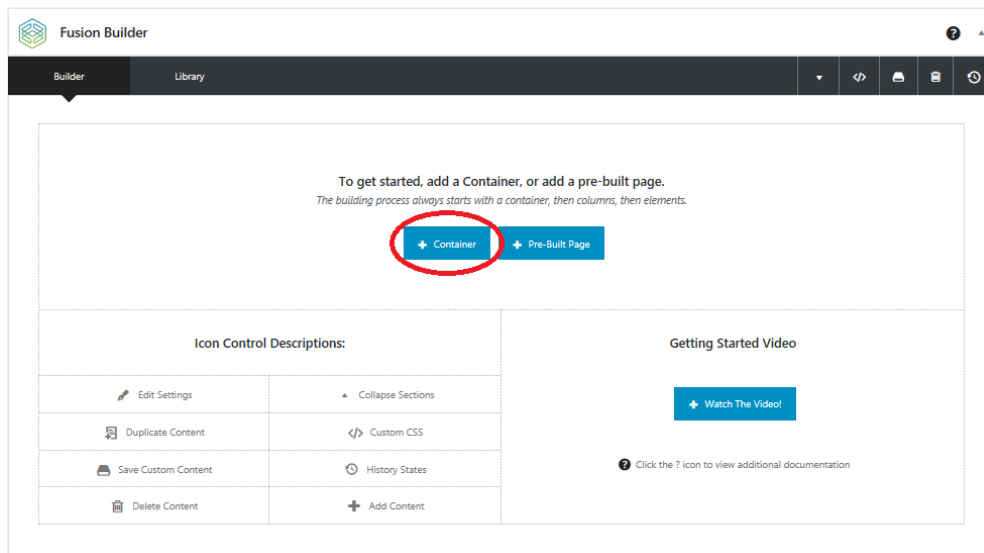


Figure 4 Avada Theme Insert Container Button

The bottom left of this screen gives you descriptions of the icons that you will see throughout your time using the Fusion Builder. Figure 5 is an enlarged version of this to use as a reference for the remainder of this manual.









 Edit Settings	 Collapse Sections
 Duplicate Content	 Custom CSS
 Save Custom Content	 History States
 Delete Content	 Add Content

Figure 5 Avada Theme Icon Lookup Table

- In this documentation, we will be starting from scratch so the first thing we are going to do is click on the “+Container” button in the middle of our Fusion Builder. You will be greeted with the modal shown in Figure 6.

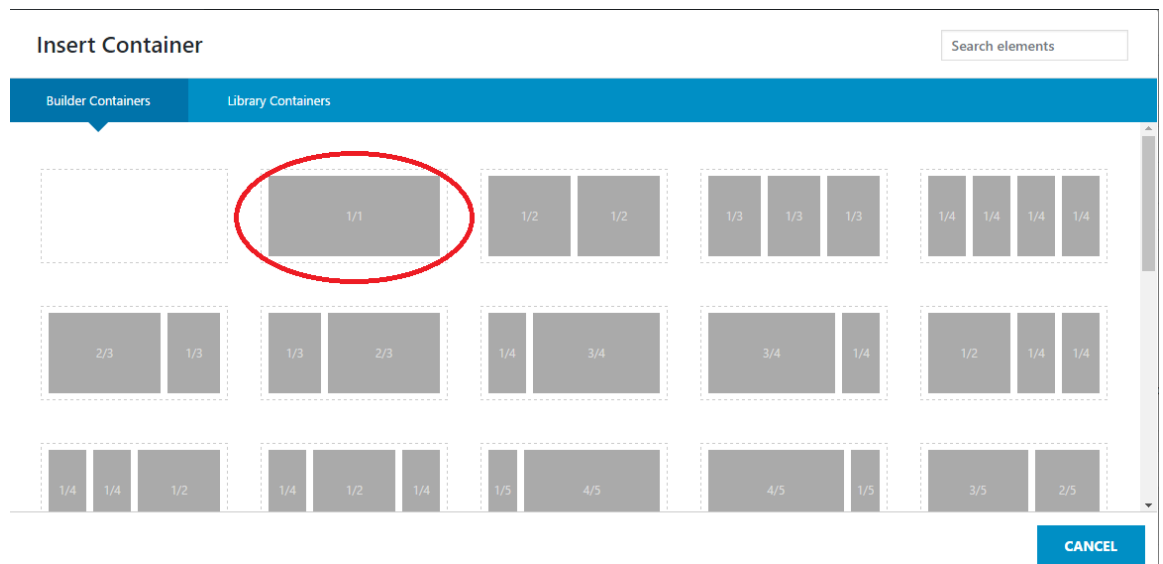


Figure 6 Avada Theme Container Layout Screen

- A container can be thought of as a box on our page so that we can add text, headers, pictures, etc. Our content will only expand to the width of our container to make organizing content on pages very easy. We will first start with a container that takes up the entire width of our page. Click on the circled box in Figure 6 to do just this.

- We now have added our container to our page and we are ready to add content to our container.

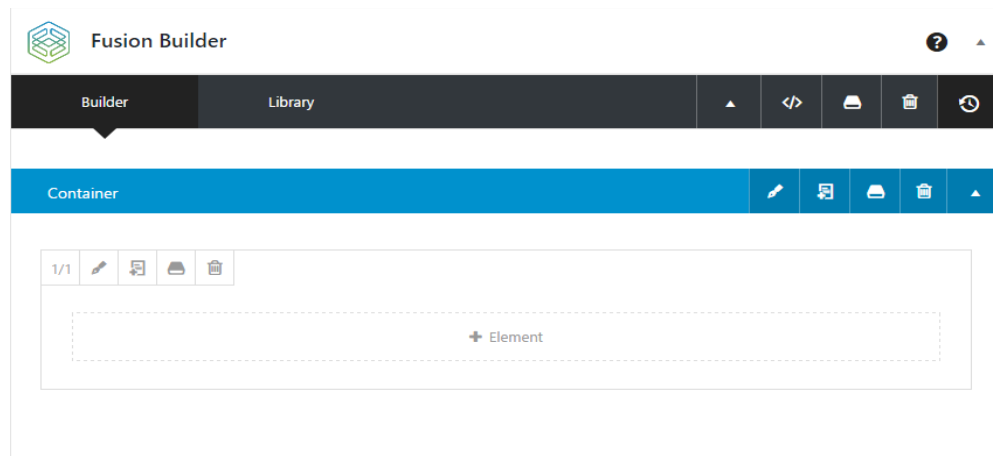


Figure 7 Avada Theme Empty Container

- To add some content to our container, press anywhere in the box outlined by the dotted lines with text "+Element" in Figure 7. Elements are going to be our individual pieces of information that we can organize inside of our container to match the layout we would like. We are then displayed Figure 8 which has 3 different tabs to choose from:

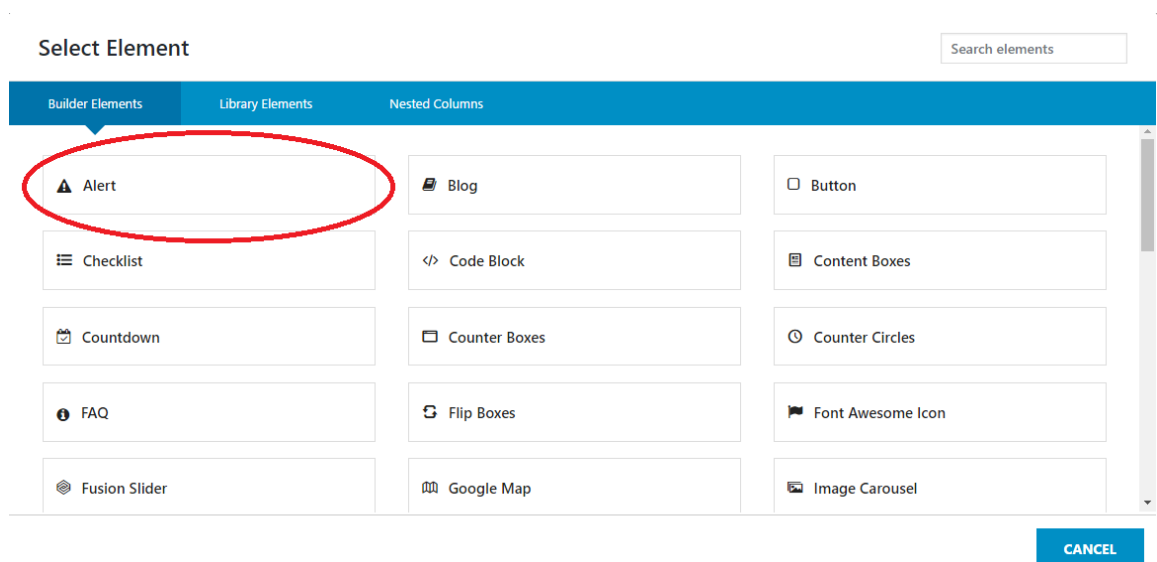


Figure 8 Avada Theme Elements Page

8. “Builder Elements” are the pre-built components that come with the Avada theme which have a variety of built in features to use to your liking.

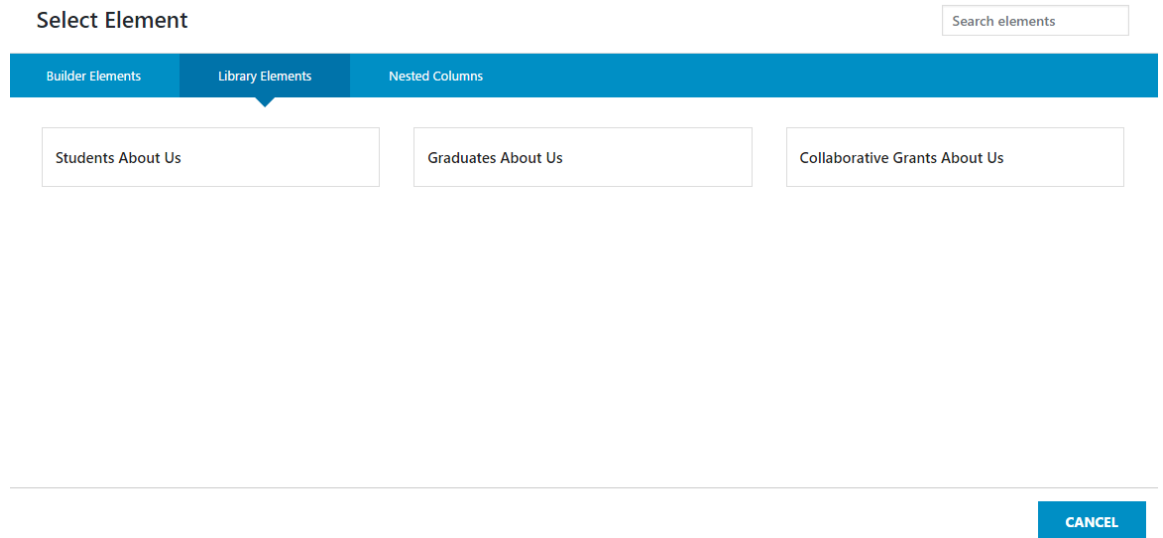


Figure 9 Avada Theme Saved Elements Page

9. The “Library Elements” tab, shown in Figure 9, contains all of the elements that you have created that you have chosen to save for later use or as a template to duplicate multiple times. As you can see, we have saved the “Number Total” elements for students, graduates, and collaborative grants on the “About” page.

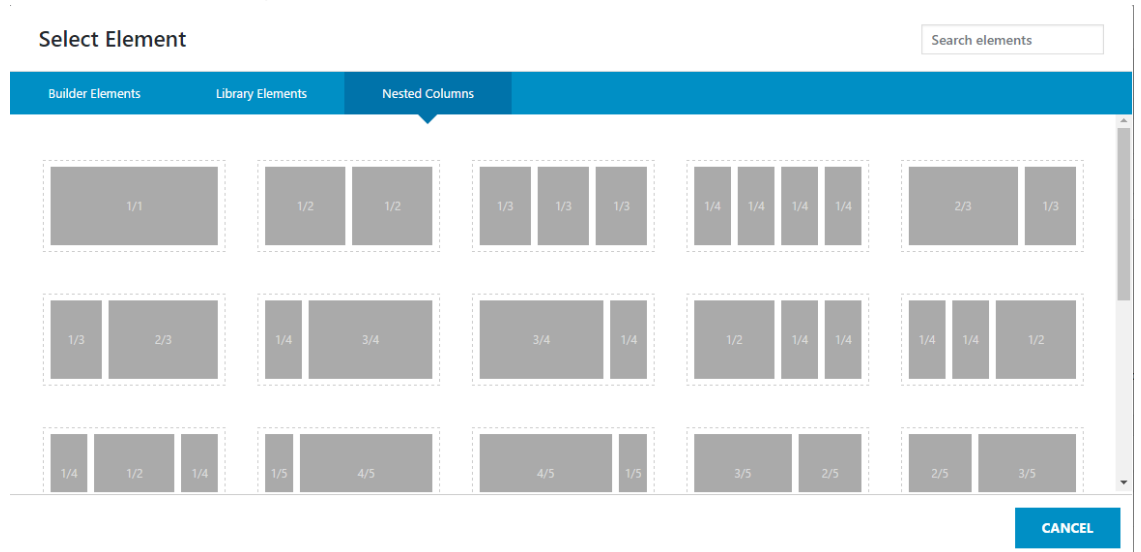


Figure 10 Avada Theme Nested Elements Page

10. The “Nest Columns” tab, shown in Figure 10, allows you to add nested containers inside of a container.
11. Navigate back to the first tab and choose the “Alert” Builder Element circled in Figure 8. Every Builder Element you choose will then open another menu that has a variety of options and text boxes to fill-in in order to personalize your element. Figures 11 and 12 show the values we have chosen for this example Alert element we are creating.

Alert

General Animation

Alert Type
Select the type of alert message. Choose custom for advanced color options below.

Success

Box Shadow
Display a box shadow below the alert box.

Yes No

Alert Content
Insert the alert's content.

SAVE CANCEL

Figure 11 Avada Theme Edit Alert Element Page

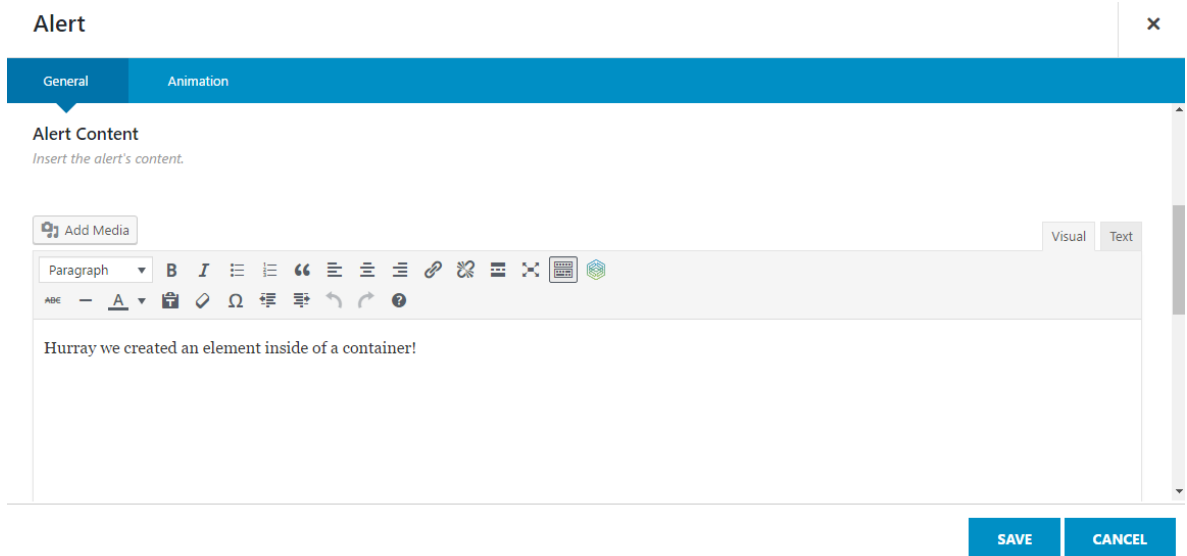


Figure 12 Avada Theme Edit Alert Content Page

Once you have done this, press “Save” and you should now see what a container looks like when it has an element in it.

12. Go ahead and navigate to the top of the “Add New Page” screen and press “Publish” in the top right of the page.

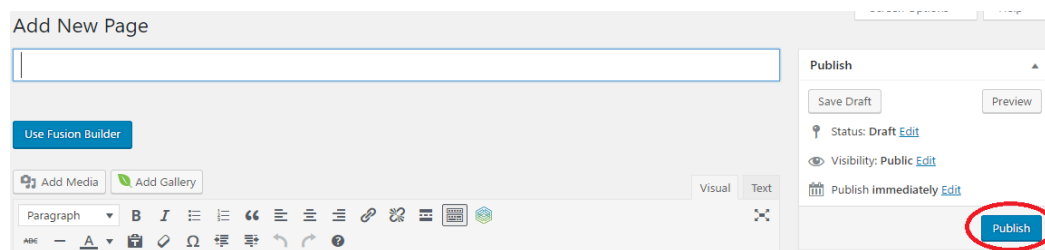


Figure 13 WordPress Add New Page with Publish Button

13. Your “Add New Page” header will turn into “Edit Page” and you will now have a link that you can click on to view our newly created page. Go ahead and click on the link circled in Figure 14 to see our container and “Alert” element!

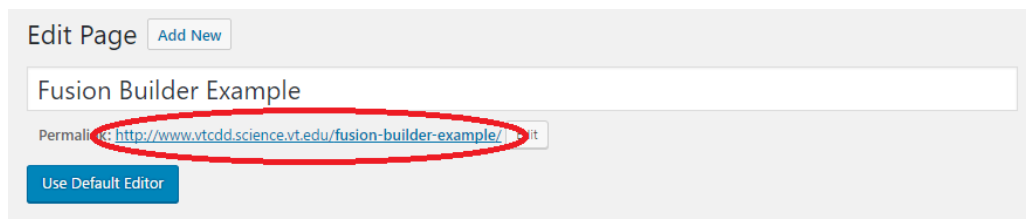


Figure 14 WordPress Page URL Location

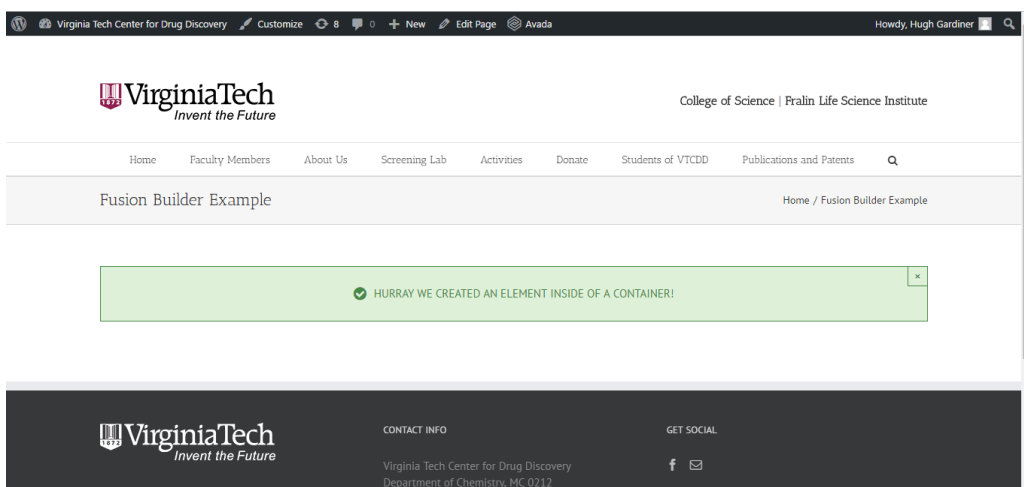


Figure 15 Example Container and Element Page

4.3. Using WordPress

1. Once you are logged in you should be directed to the dashboard shown in Figure 16.

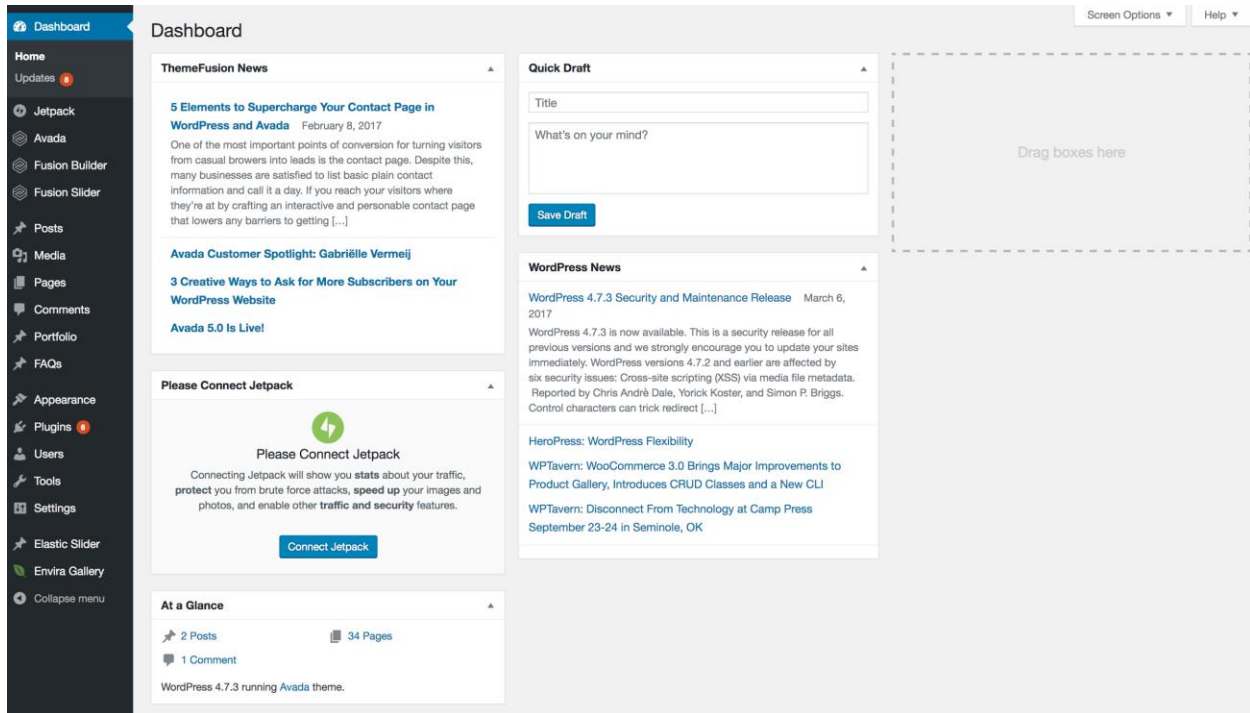


Figure 16 WordPress Dashboard

2. From the dashboard, you can access everything from individual pages, to media and various settings. If you would like to access any of the pages you have created or would like to create a new one, click the “Pages” icon on the left bar. If you would like to add, or edit any media (i.e., photos and videos) click on the “Media” icon on the left bar. If you would like to customize the Avada theme, click on the “Appearance” icon on the left bar.

4.4. Accessing Any Photos or Videos

1. Click on the “Media” tab on the left-hand side of the page shown in Figure 17.

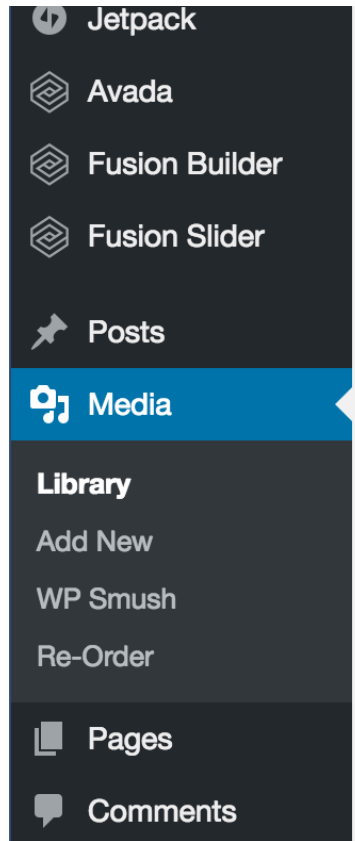


Figure 17 WordPress Side Bar

You should now be redirected to your media library containing any photos or videos you have previously uploaded

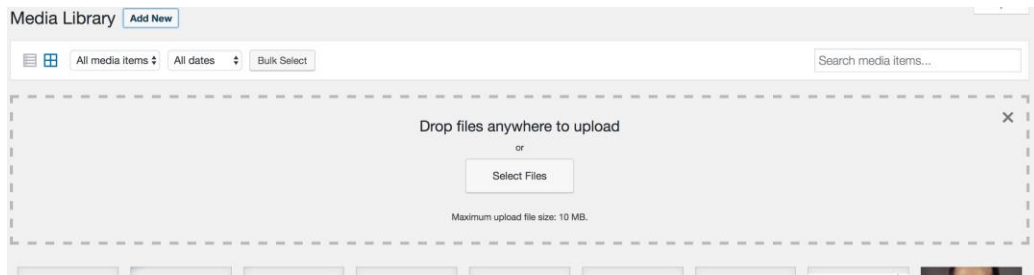


Figure 18 Upload Media Page

In order to add a new photo, click the “Add New” button shown in the top left corner of Figure 18, and then either drag and drop your photo into the box, or

search for the photo via your files. Once the photos have been added, you can edit their information however you like by clicking on them directly.

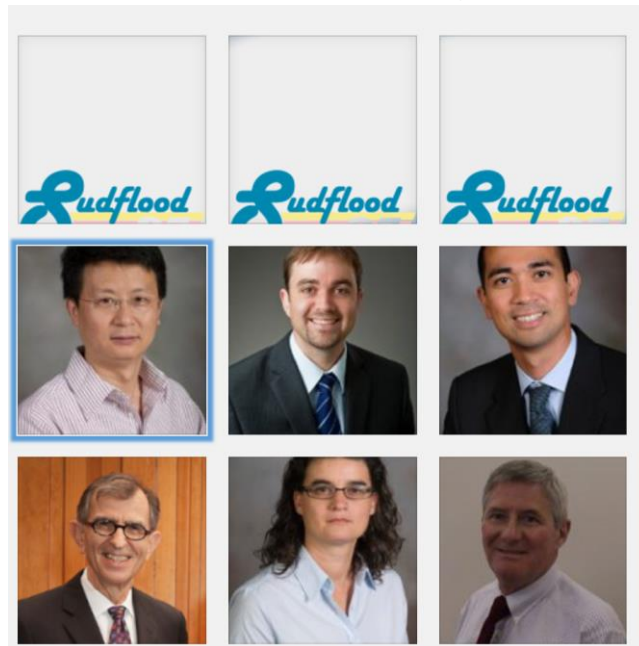


Figure 19 Media Library Example

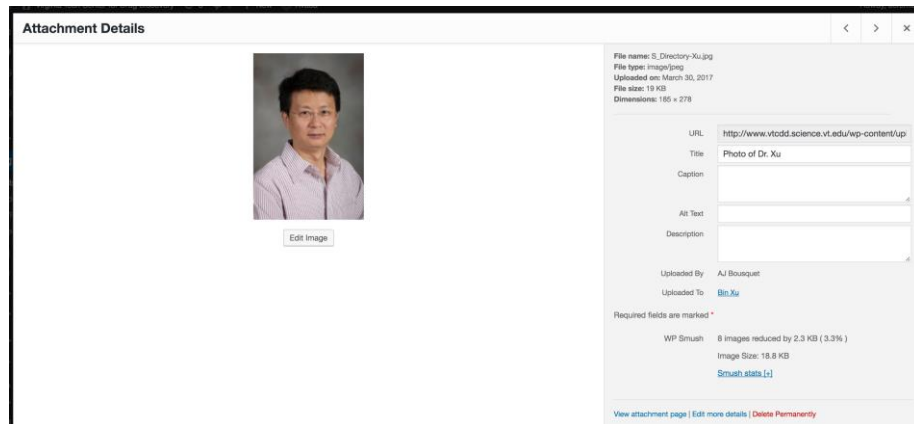


Figure 20 WordPress Edit Media Page

Figures 19 and 20 show some photos in our library, and then what is brought up when we select one photo that we would like to edit further.

4.5. Editing the Home Page

- Navigate to the Home Page
 - Pages > Home > Edit

4.6. Slider Settings

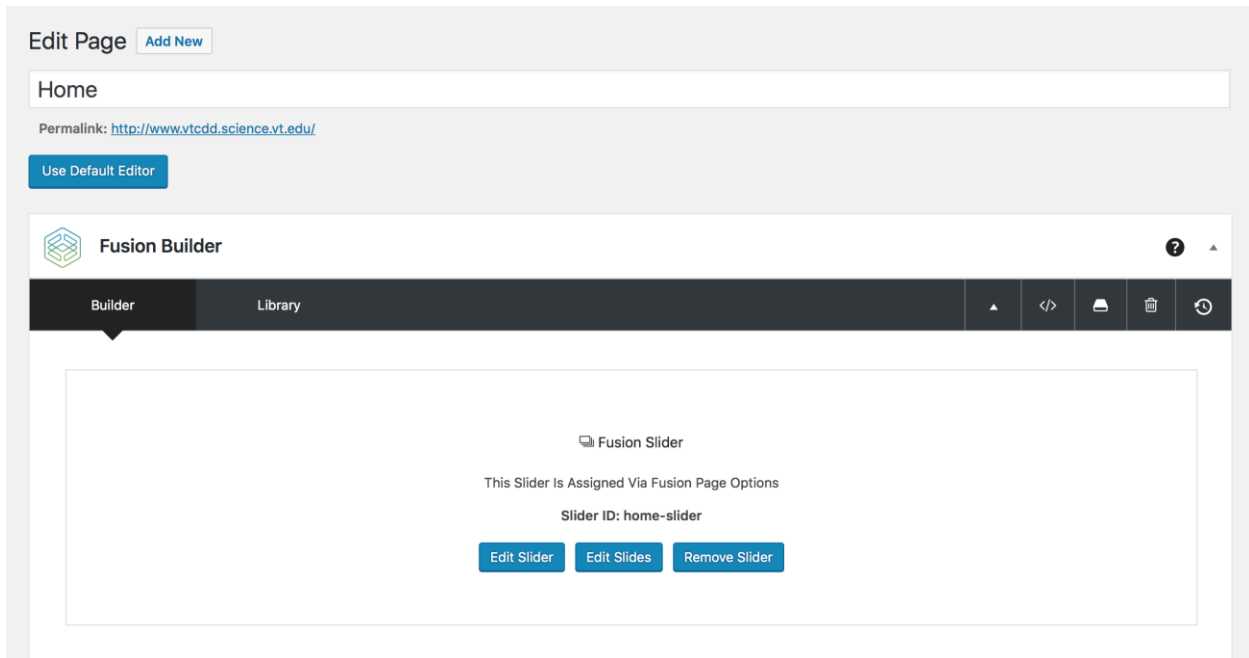


Figure 21 Avada Slider Fusion Builder

1. To edit the slider's overall settings, select the "Edit Slider" button from the Fusion Builder shown in Figure 21.
2. Figure 22 shows the various settings that can be adjusted, such as slide speed, autoplay, and animation.

Edit Slider

[Clone this slider](#)

Name
The name of your slider.

Shortcode
This is the shortcode name that can be used in the post content area. It is usually all lowercase and contains only letters, numbers, and hyphens.

Slider Size Enter a pixel value for width and height, ex: 1000px
 Width Height

Slider Content Max Width
Controls the width of content, in pixels, ex: 850px. Leave blank for site width.

Full Screen Slider Check this option if you want full width and height of the screen.

Parallax Scrolling Effect
Check this box to have a parallax scrolling effect, this ONLY works when assigning the slider in page options. It does not work when using a slider shortcode. With this option enabled, the slider height you input will not be exact due to negative margin which is based off the overall header size. ex: 500px will show as 415px. Please adjust accordingly.

Display Navigation Arrows Check this box to display the navigation arrows.

Navigation Box Size Enter a pixel value for width and height, ex: 40px
 Width Height

Navigation Arrow Size
Enter a pixel value for the arrow size, ex: 14px

Display Pagination Circles Check this box to display the pagination circles.

Autoplay Check this box to autoplay the slides.

Slide Loop Check this box to have the slider loop infinitely.

Animation The type of animation when slides rotate. Please Note: Fade effect does not work in IE.

Slideshow Speed
Controls the speed of the slideshow. 1000 = 1 second.

Animation Speed
Controls the speed of the slide transition from slide to slide. 1000 = 1 second.

Responsive Typography Sensitivity
Values below 1 decrease resizing, values above 1 increase sizing. ex: .6

Minimum Font Size Factor
Minimum font factor is used to determine minimum distance between headings and body type by a multiplying value. ex: 1.5

[Update](#)

Figure 22 Avada Slider Settings

3. Once you make your changes, select “Update” to save the changes.

4.7. Slides

1. Select “Edit Slides” from the Fusion Builder.

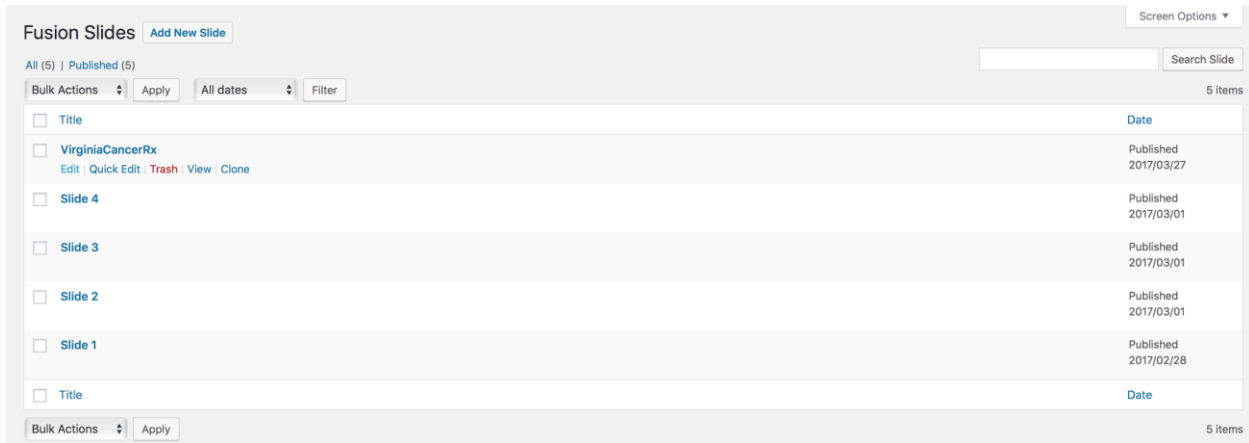


Figure 23 Avada Edit Fusion Slides

2. There are currently 5 slides in Figure 23 and each of them are attached to the home-slider. To add a new slide select “Add New Slide” at the top of the Fusion Slides screen. For this tutorial, we will edit the first slide, VirginiaCancerRx. Select “Edit” under the slide listed.

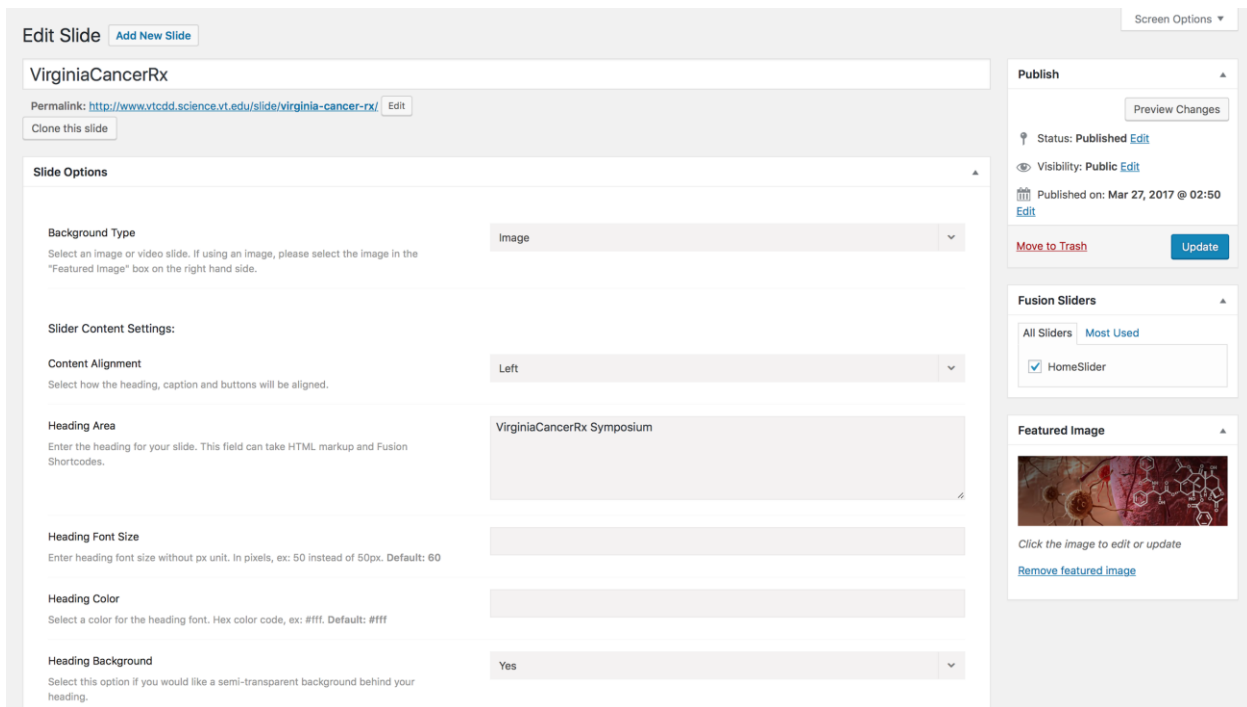


Figure 24 Avada Edit Sliders

3. You can change the title of the slide in the title bar where VirginiaCancerRx is located in Figure 24.
4. To edit the title that appears on the slide, edit the “Heading Area” text.
5. You can adjust the font size of the header text and color, or leave it blank for the defaults.
6. To ensure that this slide appears on the home page, check the HomeSlider checkbox on the right sidebar. This is especially necessary when creating a new slide.
7. To add a picture background, set the featured image on the right sidebar. Select the image to upload a new photo.

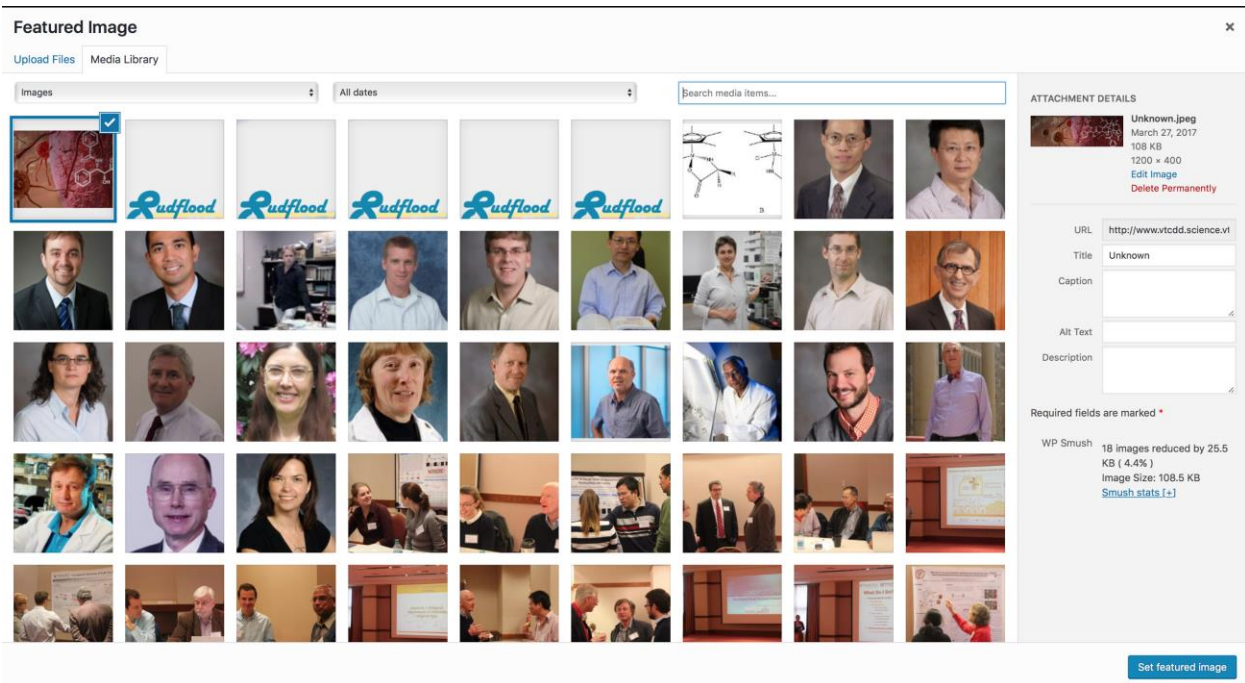


Figure 25 WordPress Media Library

8. You can either upload a new photo or select one that has already been uploaded. Once you have made your selection, press “Set Featured Image”

Heading Background Color Select a color for the heading background. Hex color code, ex: #000. Default: #000	<input type="text"/>
Caption Area Enter the caption for your slide. This field can take HTML markup and Fusion Shortcodes.	<input type="text" value="May 30-31, 2017"/>
Caption Font Size Enter caption font size without px unit. In pixels, ex: 24 instead of 24px. Default: 24	<input type="text"/>
Caption Color Select a color for the caption font. Hex color code, ex: #fff. Default: #fff	<input type="text"/>
Caption Background Select this option if you would like a semi-transparent background behind your caption.	<input type="text" value="Yes"/>
Caption Background Color Select a color for the caption background. Hex color code, ex: #000. Default: #000	<input type="text"/>
Slide Link Settings:	
Slide Link Type Select how the slide will link.	<input type="text" value="Full Slide"/>
Slide Link Please enter your URL that will be used to link the full slide.	<input type="text" value="http://vaddc.org/virginiacancerrx/"/>
Open Slide Link In New Window	<input type="text" value="Yes"/>

Figure 26 Avada Theme Slider Image Settings

9. To edit the subtitle text on the image, edit the “Caption Area” text.
10. You can also adjust the caption font size and color or keep the default.
11. There is an option to have a solid background color behind just the text. That is located under the “Heading Background” option and “Caption Background.”
12. To set a link on the slide, use the dropdown for “Slide Link Type.” You can create a button or use the whole slide to be a link.
13. It is recommended to have the slide take you to a new window if it is an external site. That setting can be adjusted in “Open Slide Link in New Window.”
14. Once you have made all of your changes, press “Update” on the top right sidebar to save your changes.

4.8. Content Boxes

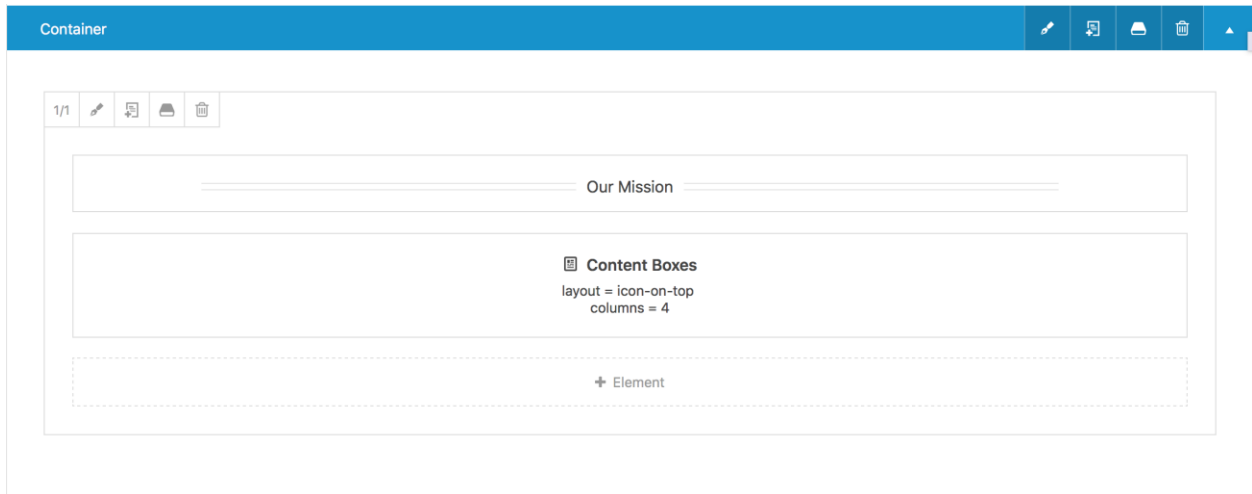


Figure 27 Avada Fusion Builder Content Boxes

1. To edit the content boxes such as the ones on the home page, navigate to the home page and open the edit screen. If you scroll down in the Fusion Builder, you will see a content box under “Our Mission.”
2. Placing your mouse over the box will display the edit options. Click on the paint brush to open the edit window shown in Figure 28.

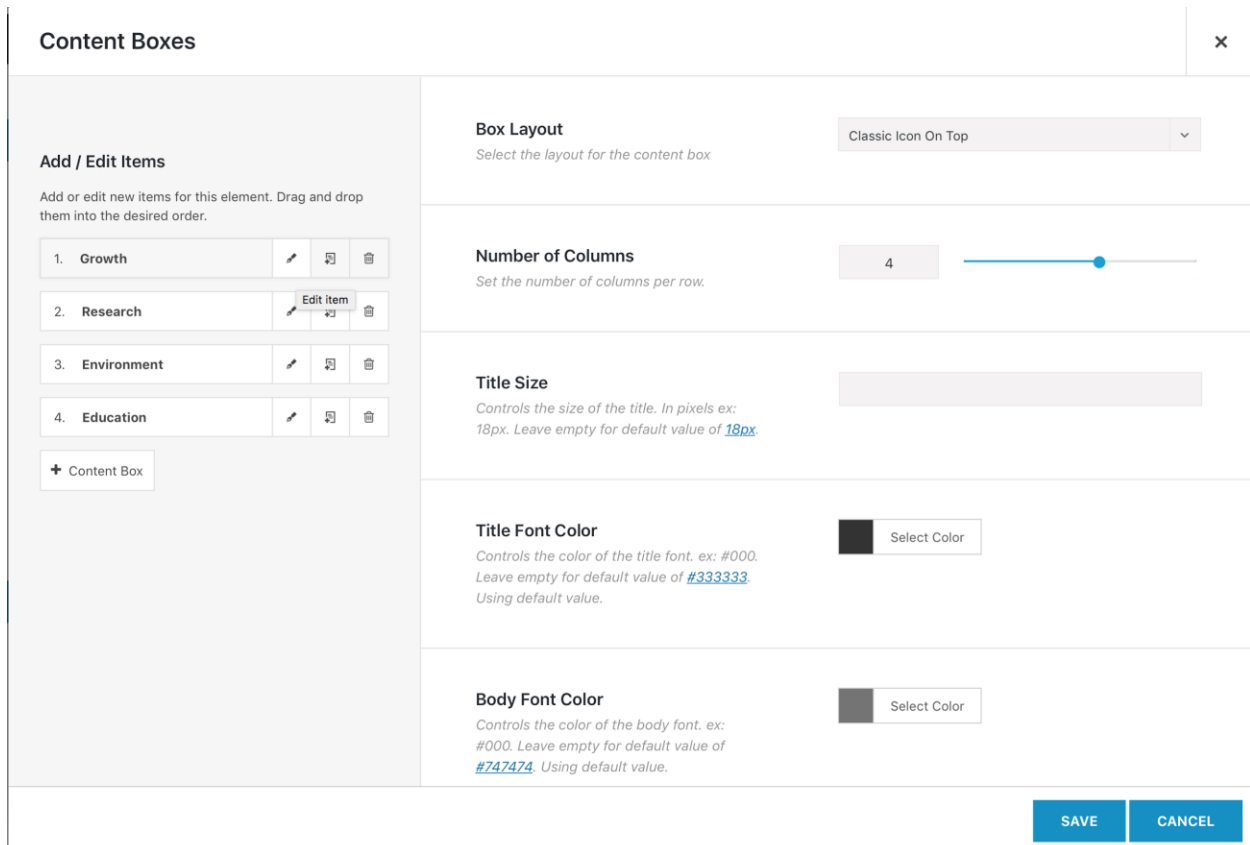


Figure 28 Avada Content Boxes Settings

3. The edit window will have the general edit settings on the right for all of the multiple content boxes. You should be fine leaving them as the default settings.
4. Looking on the left sidebar you will see the four content boxes: “Growth”, “Research”, “Environment”, and “Education”. Click on the paint brush next to the one you want to edit.

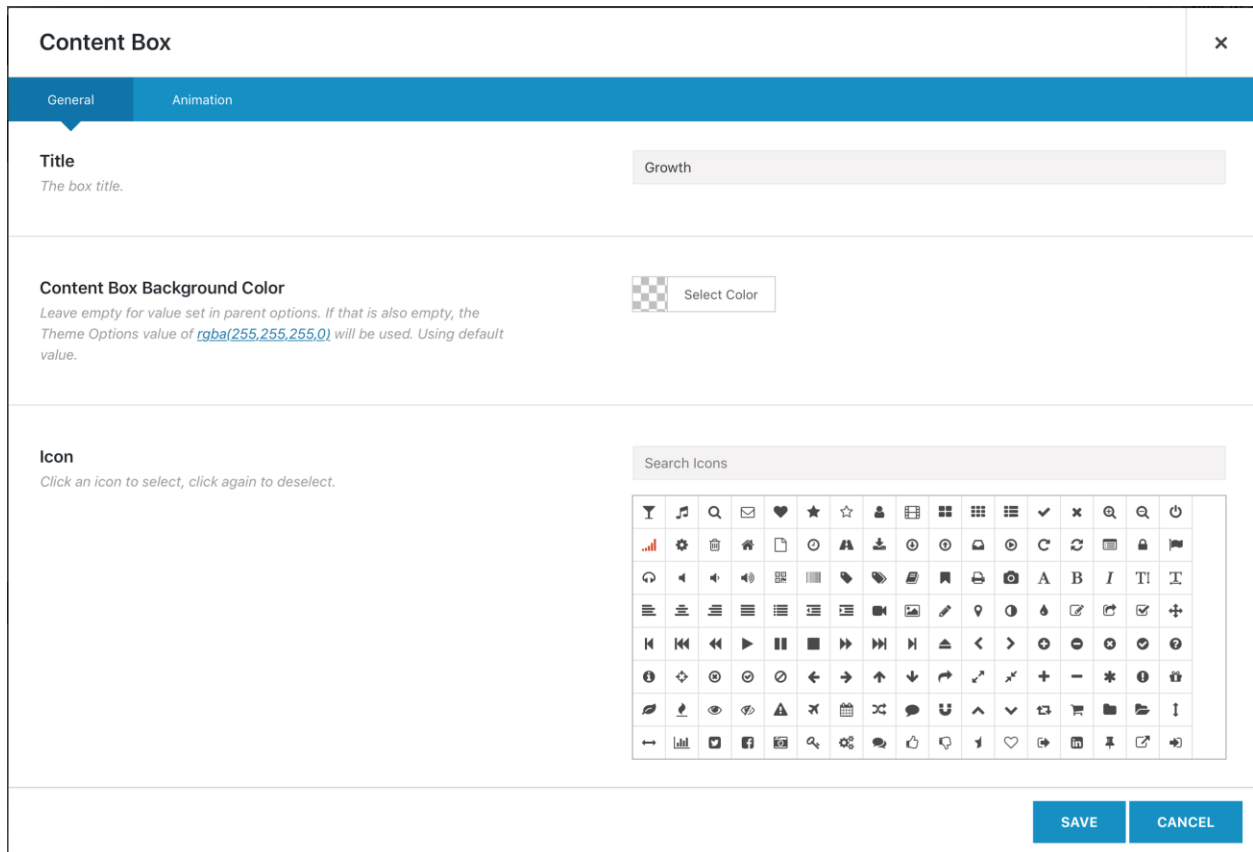


Figure 29 Avada Content Box Content

5. You can change the title of the content box by editing the title section.
6. You can change the icon by selecting from the grid of listed icons under the icon section.
7. There are other settings that you can adjust for the look of each content box, as you scroll through the “Content Box” settings.

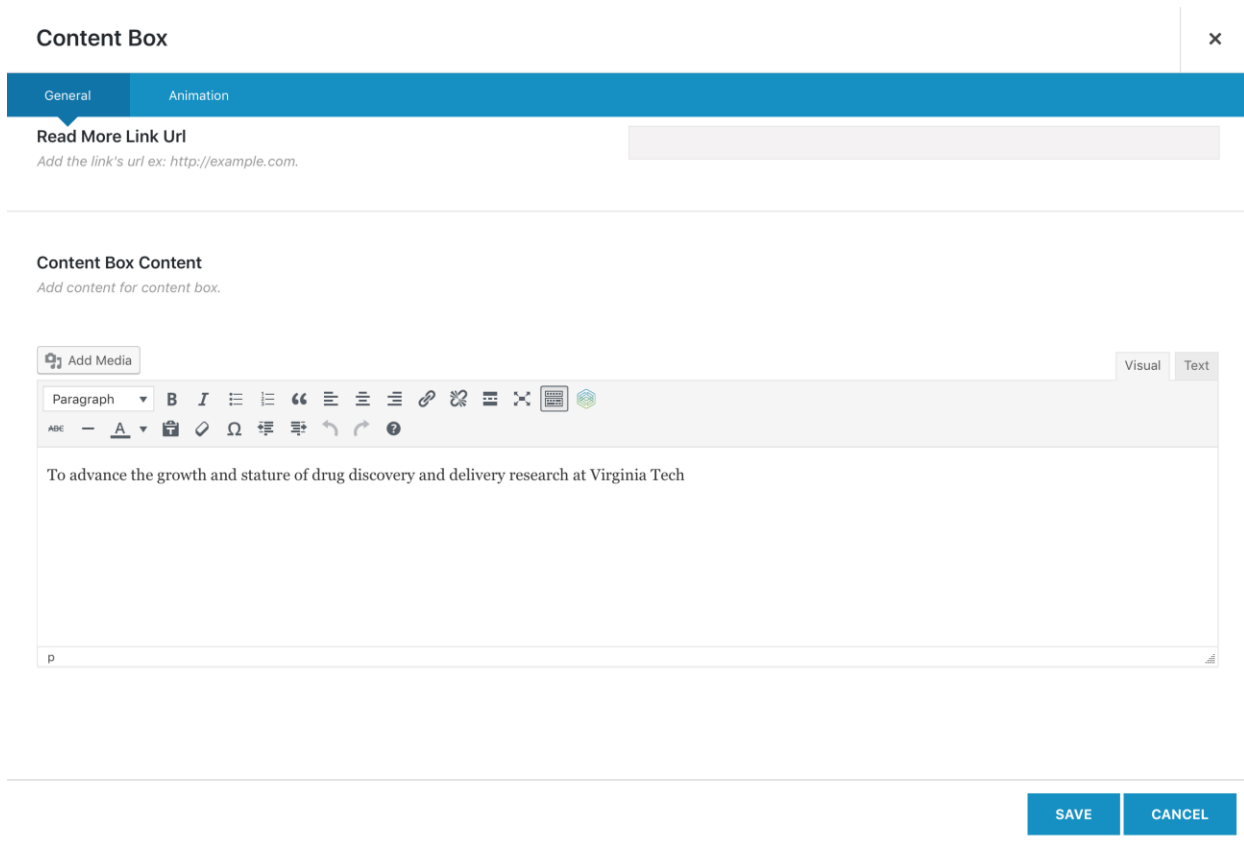


Figure 30 More Avada Content Box Content

8. At the bottom of the settings is the content section shown in Figure 30. This is where you can add a description to coordinate with the title
9. Save changes in the pane.

4.9. Separator

1. If you would like to duplicate any of the colored separator bars with content in them, you can clone the already existing bars.

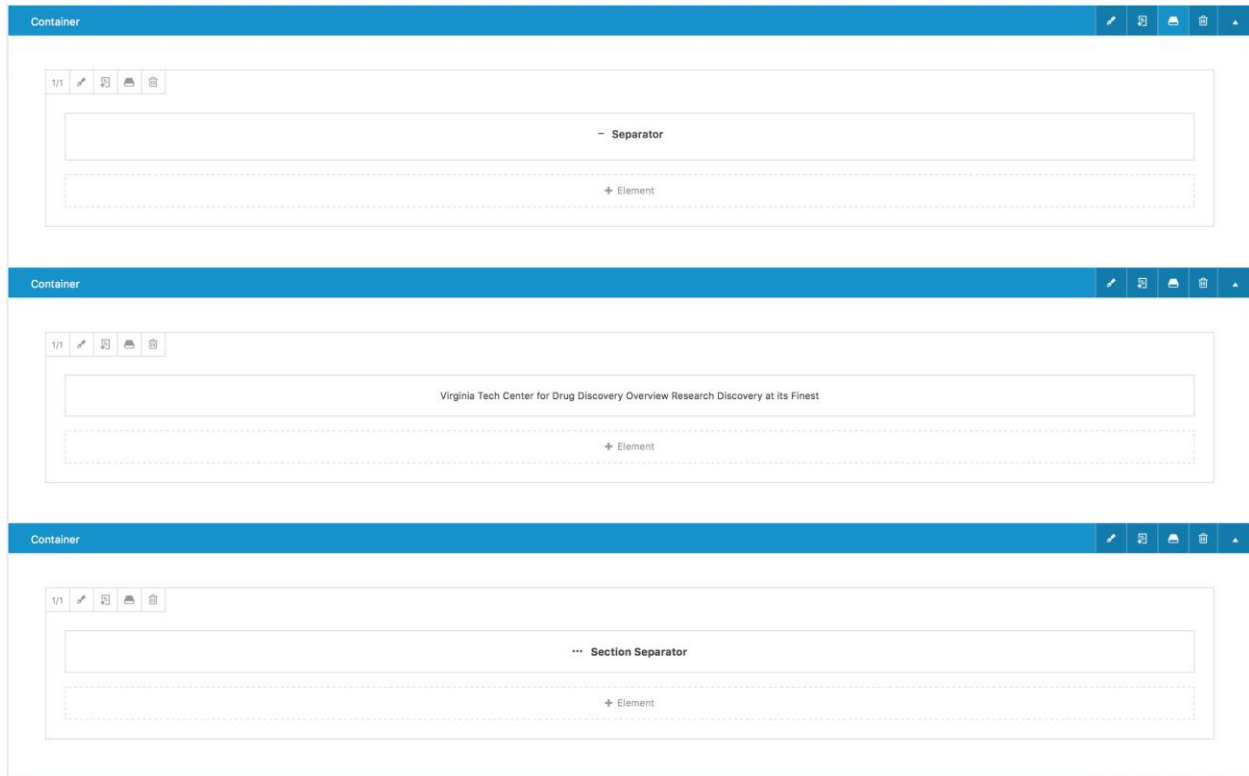



Figure 31 Avada Separators

2. Figure 31 shows the three components that make up a separator bar: the separator, the text and the section separator. To clone them, press the clone button () at the top of each container. Then, drag them into the same position as you see above.
3. To edit, you can place your mouse over the text and press the paint brush image to pull up the edit screen. Then, edit the text in the editable content box.
4. Save changes in the pane.

4.10. Buttons

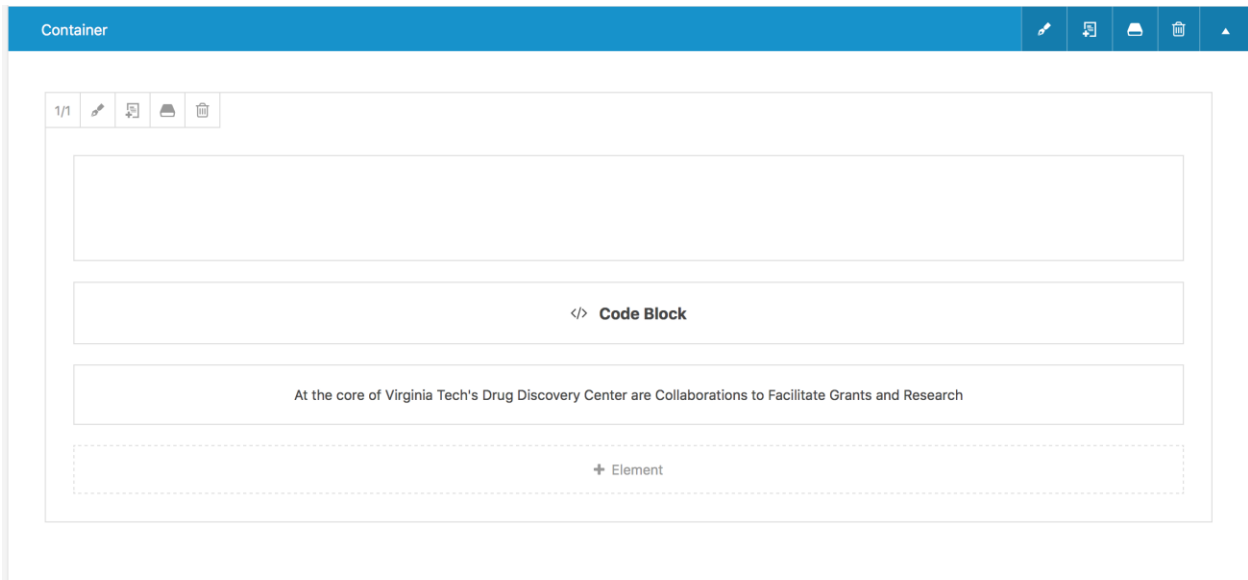


Figure 32 Avada Container with Buttons

1. To edit a button and its destination, such as the VTCDD member collaborations, go to the corresponding container in the home page in the edit mode. Since the text is white on the button, it is more difficult to find, but it is the box right above the “</> Code Block” seen in Figure 32.
2. Click on the paintbrush icon to edit it

Button ✕

General Design Animation

Button URL
Add the button's url ex: <http://example.com>.

Button Text
Add the text that will display on button.

Button Title Attribute
Set a title attribute for the button link.

Button Target
._self = open in same window, ._blank = open in new window.

_self _blank

Alignment
Select the button's alignment.

Text Flow Left Center Right

Figure 33 Avada Button Element Settings

3. In the Button edit pane, you can change the destination and the text. If you would like to change the style and look, you can go under the design tab under at the top of the Button edit pane.
4. Save changes in the pane.

4.11. Text Boxes

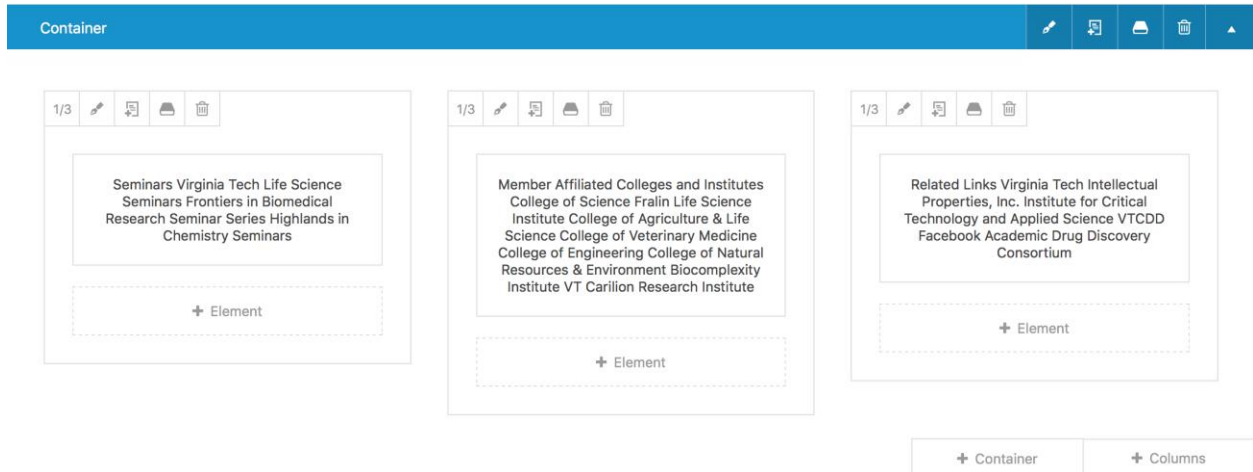


Figure 34 Avada Container with Text Boxes

1. Some of the containers have text boxes in three columns, like in Figure 34.
2. To edit the individual boxes, place your mouse over them and click on the paintbrush to open the edit pane.

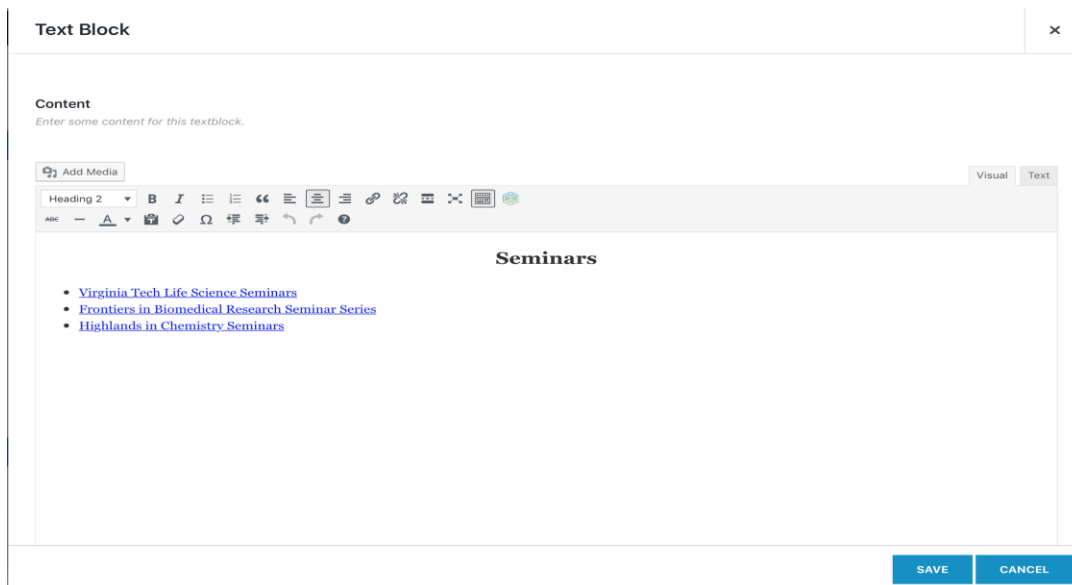



Figure 35 Avada Text Block Content Editor

3. Figure 35 shows the edit pane that is provided with a text editor where you can format your text.

4. To make a hyperlink, highlight the text and press the link button 

- [Highlands in Chemistry Seminars](#)

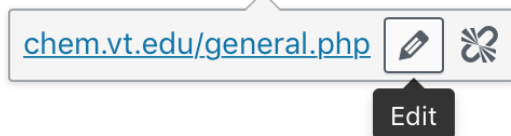


Figure 36 WordPress Hyperlink Wizard

5. Once you have the link on there, you can edit it by clicking on the blue text and pressing the edit pencil that appears in Figure 36.

- [Highlands in Chemistry Seminars](#)



Figure 37 Avada Edit Hyperlink Wizard

6. Confirm your edits by pressing the blue return button shown in Figure 37.

7. Save changes in the pane.

4.12. Faculty Pages

1. To edit the faculty information, you need to go to the FAQ section of the website. The site utilizes the FAQ's functionality to allow for clean, sortable accordions. TO get to the FAQ, look at the following image:

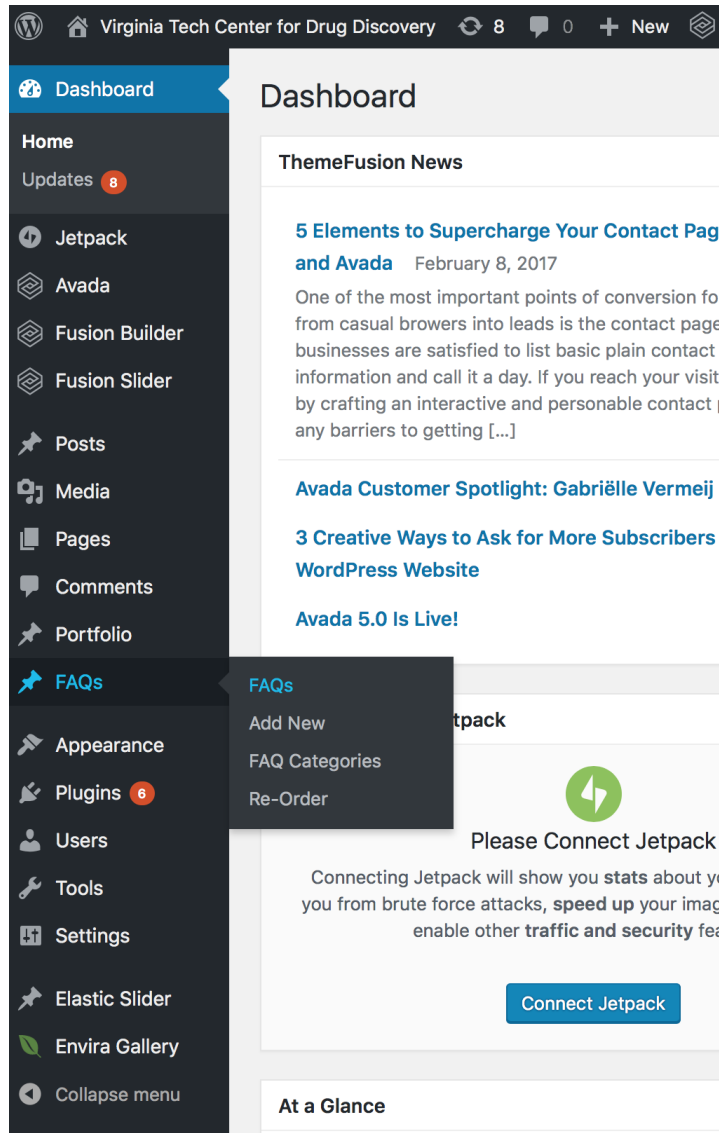


Figure 38 WordPress FAQ's Menu Location

2. Selecting the FAQ's tab will bring up all of the faculty member pages.



Figure 39 WordPress FAQ's Page

- To create a new page, select the "Add New" button seen at the top of Figure 39. Otherwise, edit a page by putting your mouse over the page name and selecting "Edit."

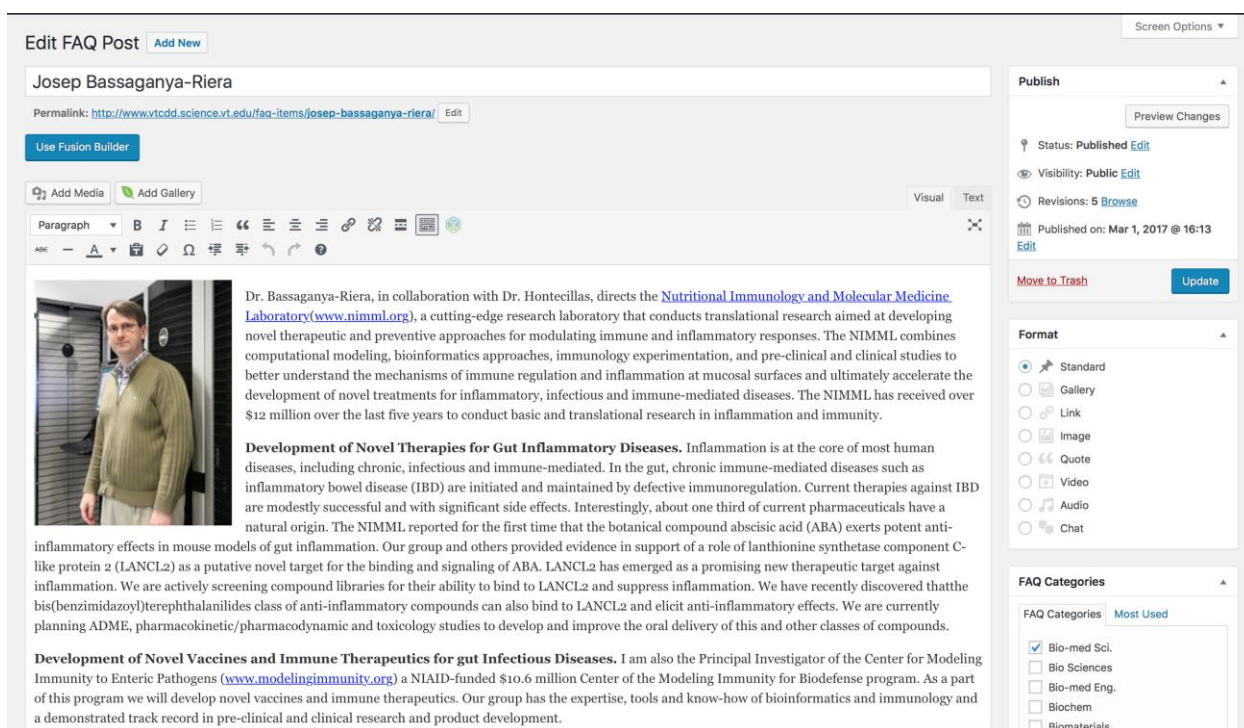



Figure 40 WordPress Edit FAQ Post

- The edit screen, shown in Figure 40, will have the title at the top, which can be edited and editable text box. You can change the text within the text box.

5. To add a link, highlight the text and click the link button in the text box toolbar



6. To add an image, place the cursor where you want the image to be and select the “Add Media” button above the text box . Then, follow the upload or selection screens that follow.

7. To ensure that the person’s page can be filtered, use the FAQ Categories on the right sidebar.

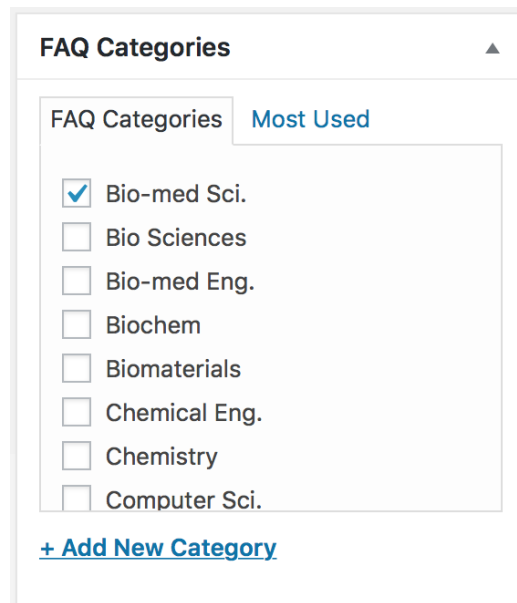


Figure 41 WordPress FAQ Categories

8. The categories in Figure 41 represent the various fields of study. Check all that apply to the faculty member. If a new category needs to be created, select “+Add New Category.”
9. Once all changes are made, press update at the top right of the screen to save your changes.
10. To reorder the list of faculty, select the “Re-Order” tab on the left side of the screen, as illustrated in Figure 42.

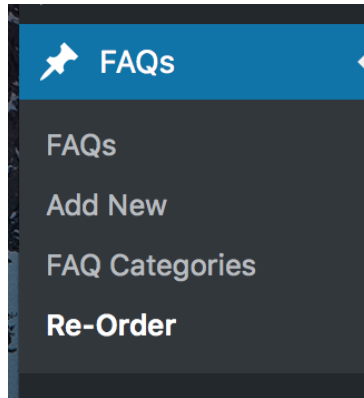


Figure 42 WordPress Re-Order FAQ's

11. In the following screen, you can use your mouse to drag and reorder the faculty pages.
12. To save your changes, select update at the very bottom of the page.

4.13. VTCDD Member Collaborations

1. Navigate to the VTCDD Member Collaborations page and select edit under the page options.

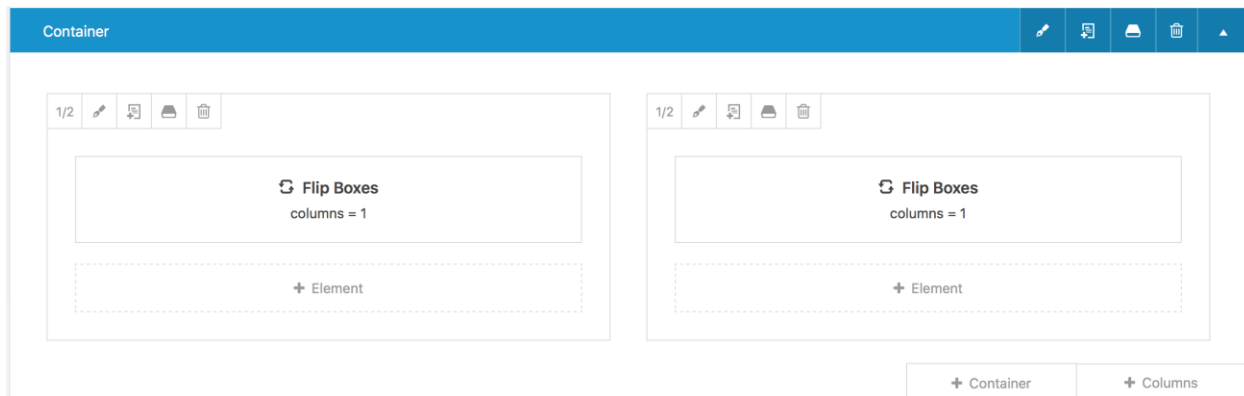


Figure 43 Avada Container with Flip Boxes

2. Once the page is open, you will see two flip boxes side by side, after scrolling down the page, as illustrated in Figure 43. These two flip boxes hold the two columns of collaborations.
3. If you would like to edit or add one, try to balance the number on each side so that it is aesthetically pleasing on the live site.

- To edit, place your mouse over the flip box and select the paintbrush icon to open the edit pane.

Flip Boxes [X]

Add / Edit Items

Add or edit new items for this element. Drag and drop them into the desired order.

1. Dr. Blaise Cost... [edit] [clone] [trash]
2. Dr. Paul Carlie... [edit] [clone] [trash]
3. Dr. Bin Xu (Bio... [edit] [clone] [trash]
4. Dr. Bin Xu (Bio... [edit] [clone] [trash]
5. Dr. Rafael Dava... [edit] [clone] [trash]
6. Dr. Bin Xu (Bio... [edit] [clone] [trash]

+ Flip Box

Number of Columns
Set the number of columns per row. [1] [slider]

Element Visibility
Choose to show or hide the element on small, medium or large screens. You can choose more than one at a time. Each of the 3 sizes has a custom width setting on the Fusion Builder Elements tab in the [Theme Options](#). [Small Screen] [Medium Screen] [Large Screen]

CSS Class
Add a class to the wrapping HTML element. [input field]

CSS ID
Add an ID to the wrapping HTML element. [input field]

[SAVE] [CANCEL]

Figure 44 WordPress Flip Boxes Edit Page

- In Figure 44, you will see the general settings for the flip boxes on the right and the individual boxes on the left. For now, the default settings on the right are fine.
- To add a new one, select the “+ Flip Box” button on the left sidebar.
- Let’s edit the top box. Select the paintbrush next to the top box that says “Dr. Blaise Const...”

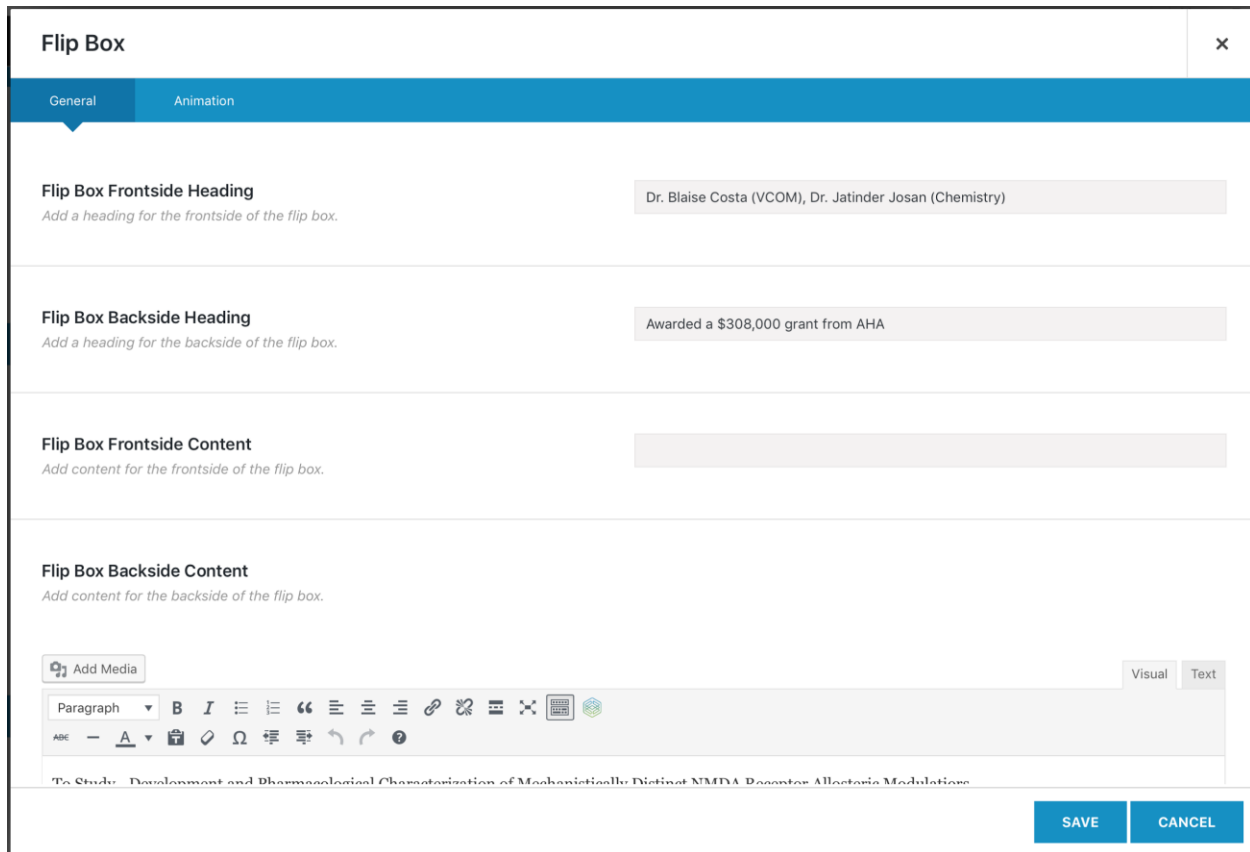


Figure 45 Avada Flip Box Settings

8. Figure 45 shows the “Flip Box” edit pane. The “Flip Box Frontside Heading” will be the main title and can be edited.
9. The “Flip Box Backside Heading” will appear when the mouse rolls over the flip box and it flips over.

Flip Box Backside Content

Add content for the backside of the flip box.

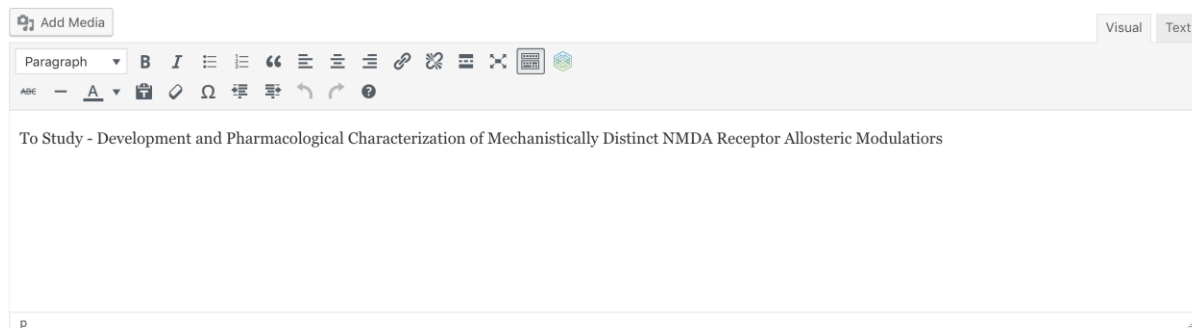


Figure 46 Avada Flip Box Backside Content Editor

10. Scrolling down a bit, we have an editable text box like the one in Figure 46. This is the content that will appear on the back of the flip box. Edit it as needed.
11. Save the changes to this individual flip box
12. Then save the changes to the overall flip box element.
13. Then update the page to view the changes.

4.14. Modals and How We Are Using Them

The concept of modals is used to highlight content and make them a predominant feature on the page, but only when an event, such as a button press, triggers the modal to show. The only use of modals within our site right now, is on the publication and patents page. When you want to trigger a modal to show, you need to create a button to trigger the modal to show. Consider the following example in Figure 47.



Figure 47 Avada Modal Button Example

This is a button that currently triggers a modal to show. This button shows Figure 48.

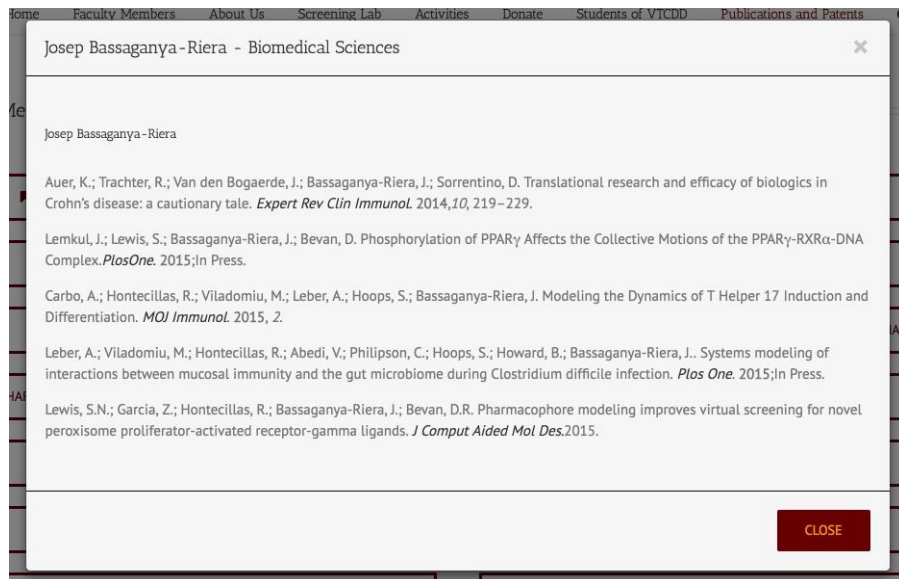


Figure 48 Avada Modal Example

Now that we see the expected behavior of a button and modal interaction, we will take a look at the code behind how this all works. Let's take a look at our publications and patents for the previous two elements.

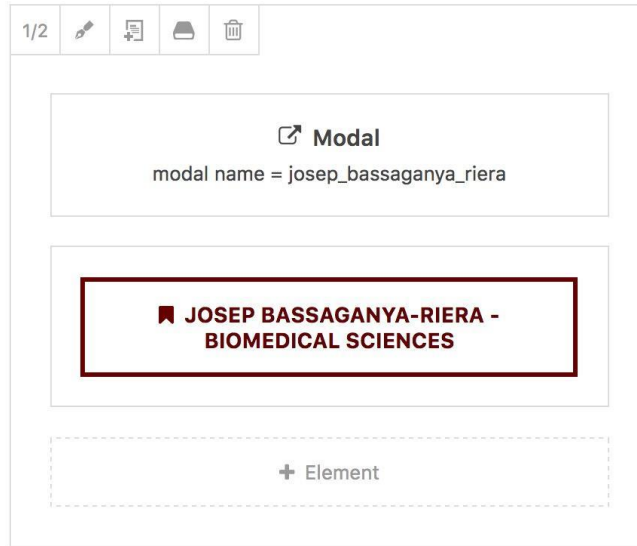


Figure 49 Avada Container with Modal Example

Figure 49 shows the fusion builder container for the elements, it consists of a modal element and a button element. Now we can examine the modal element, to interpret how we create the content within a modal, and how we have the button show the modal.

<p>Name Of Modal Needs to be a unique identifier (lowercase), used for button or modal_text_link element to open the modal. ex: mymodal.</p>	josep_bassaganya_riera
<p>Modal Heading Heading text for the modal.</p>	Josep Bassaganya-Riera - Biomedical Sciences
<p>Size Of Modal Select the modal window size.</p>	<input type="radio"/> Small <input checked="" type="radio"/> Large

Figure 50 Avada Modal Settings

Figure 50 shows us the settings available to edit for modals. The name of the modal is important: it must be unique and it will be used by the button. The current standard for naming a modal is to use the faculty member's name, as each member only has one modal associated with them. The "Contents of Modal

“section is the text editor where you can fill in the actual content you want displayed on the modal. The “Modal Heading” is the header of the modal, seen at the top of the modal.

Now let’s take a look at how we’re designing and using the button. The text for the button is simply the button text: the key thing to be concerned with is the field in Figure 51.

Modal Window Anchor

Add the class name of the modal window you want to open on button click.

josep_bassaganya_riera

Figure 51 Avada Modal Window Anchor Editor

This is the field that lets us link a button to a modal, and have the press of a button show a modal. Notice how the value for modal window anchor is the same as the modal name. This is how our WordPress theme recognizes and shows a specific modal.

To maintain consistency when adding onto this page, I would clone an existing Fusion Container, which contains the modal and the button, and simply changing specifics fields - Modal Window Anchor and Button Text on the button, and Modal Name, Modal Header, and Contents of Modal on the modal.

4.15. Patents and Publications

Continuing on the Publications and Patents page, we can take a look at the patents and patent application section.



March 2016 | U.S.
Provisional

“Polysaccharide-Based Copolymer
Materials,” by **Kevin J. Edgar** and **Shu
Liu**, a student



March 2016 | U.S.
National Stage

“Cross-Metathesized Polysaccharide
Derivatives and Processes for Preparing
Them,” by **Kevin J. Edgar**, professor of
sustainable biomaterials; **John B.
Matson**, assistant professor of
chemistry; and **Xiangtao Meng**, a
student.

Figure 52 VTCDD Patents and Publications Example

Figure 52 shows that we used an alternating pattern on the icons for these content boxes to make the sight look a little bit more friendly and aesthetically pleasing. If we look at the Fusion Builder view for these, it is a pretty straight forward process for creating a new content box, and having it fall in line.

We will use the clone option, to make the process easier. Since we want the newest patents to appear at the top of the section, we can simply clone the first element, and begin putting in the proper content. To get started, edit the content boxes in the Fusion Builder.

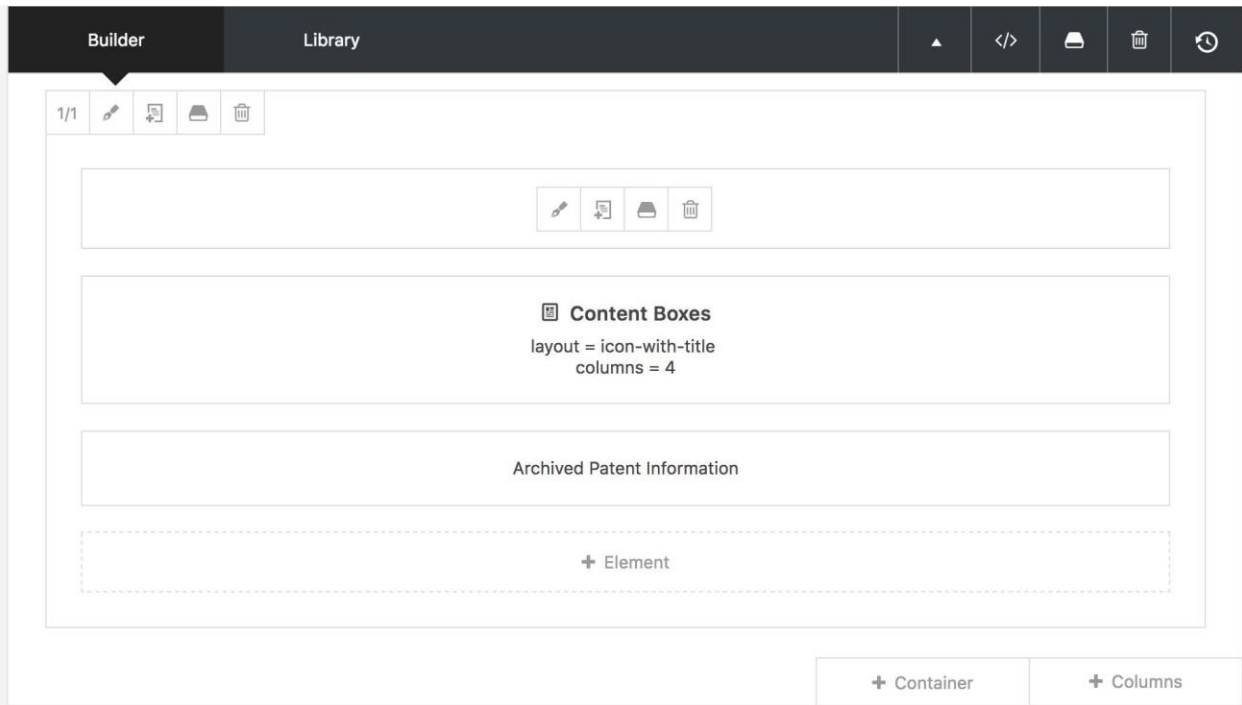


Figure 53 Container for Patents and Publications

Now we will clone the first content box, located on the left panel.

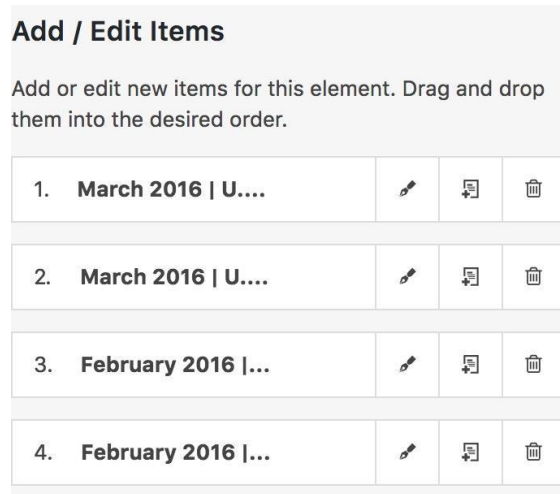


Figure 54 Avada Items Editor

Now we can begin editing the content of the first box on the panel shown in Figure 54. Some things to remember is that in order to maintain consistency for the color pattern, you will need to switch every color option, so maroon becomes orange, and orange becomes maroon. The primary fields that you need to change are title, icon color, icon background color, and content box content.

4.16. Adding Tabs to the Activities Section

For whenever you decide you want to add a new activity to the Activities Tab, we're going to need to do a little bit of tweaking to have our Fusion Builder work nicely. For now let's take a look at the activities page inside our editor. Figure 55 shows the tabs section we want to edit.



Figure 55 Avada Container with Tabs Element

Once we open the edit view, we can edit tabs or add a new tab on the left panel. Once we open the edit view on a tab, either after deciding to add one or when we want to create a new one and then edit its content. We are brought to a new view. Name the new tab whatever you want: we currently use years but you can change them easily. Then we need to add the content of the tab. Inside the tab content section, we are going to need to create a new fusion builder element, which is the last item on the nav bar that can be referenced in Figure 56.



Figure 56 WordPress Content Toolbar

For this element, we want to select the nested columns with the following margins -- $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{4}$ -- to ensure that our content is centered and in line with the tab view. Now we should see our content look something like Figure 57.

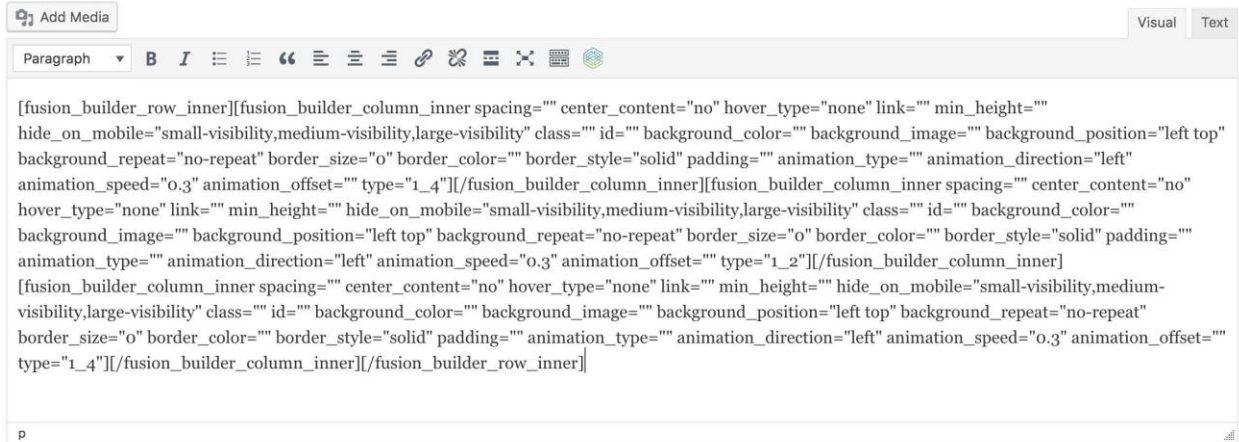


Figure 57 WordPress Content Editor with Fusion Builder Content

What we have done here is create the three different columns, as fusion builder elements, but now we want to add another fusion builder element inside the middle column. To do this, we first need to separate the three columns to make them easier to read. My advice is to separate the columns out like Figure 58.

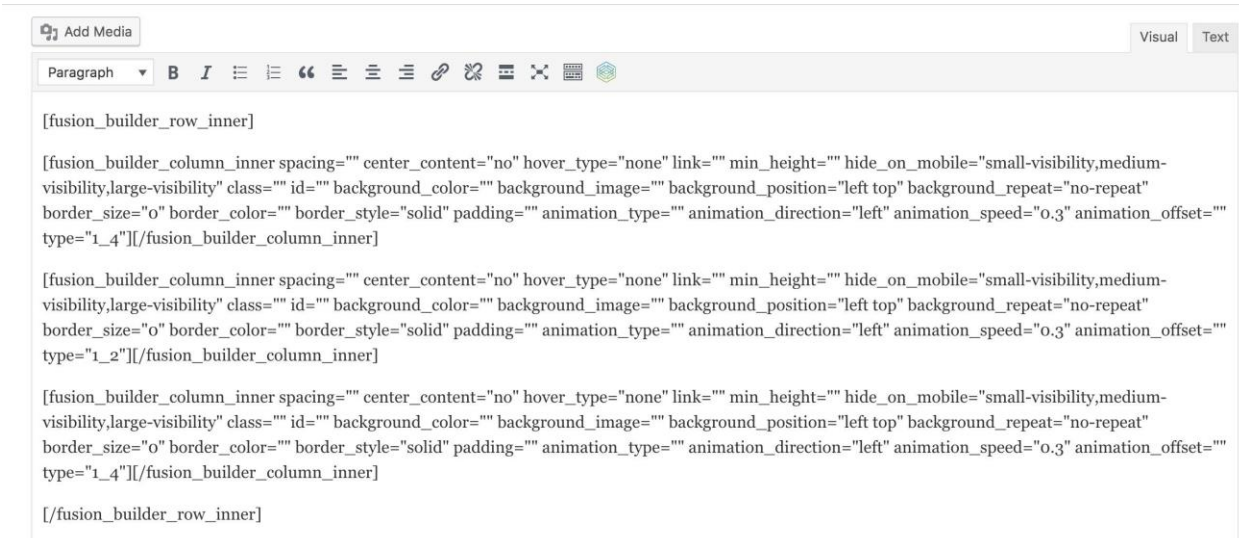


Figure 58 WordPress Content Editor with Organized Fusion Builder Elements

Now notice how the middle column uses type="1_2" instead of "1_4" because this column should take up half the page width, and be centered. This is the column we want to insert our additional content within, so we need to set our cursor after the closing ']' and before the '[/fusion_builder_column_inner]' so we can insert an element inside this column. Now we want to insert another fusion builder element, but this time switch to the Builder elements tab, and select content boxes. Be sure to set the Box Layout to "Classic Icon on Top". Now we will edit the content box: be sure to select edit on the content box on the left side panel. Now we will need to do change the following fields. Title, should be the title of the box, Image icon should be an image representation of what you wish to show, icon size should be 225x225, the read more link should link to the page you're previewing, and the content box could be a small blurb about what you're previewing. Once you've filled in each of the fields and selected save and then insert. You should see the updated content inside your content box. Simply select save, and save again to return to the default editor view.

4.17. Students of Drug Discovery Page

This page uses a 3 column layout, with 3 flip boxes to allow for an interactive page for each of the students. Once you're on the default edit view you should see something similar to Figure 59.

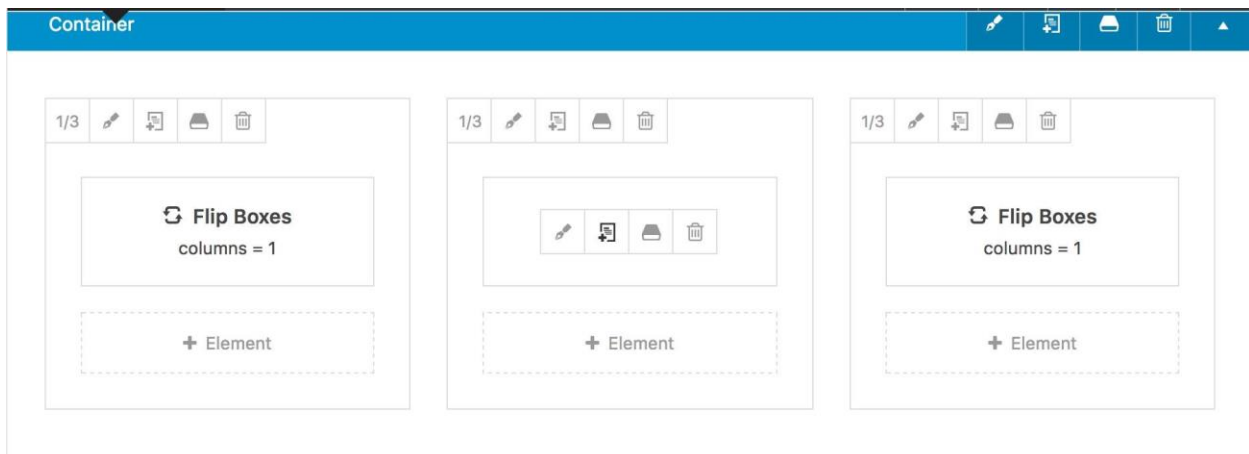


Figure 59 Fusion Builder with Flip Boxes

Determine which flip box you want to edit or add on too, each one corresponds to a column on the page. Once you've chosen to edit one of the flip boxes, you can add

or edit a specific box by selecting edit on the left hand panel. I advise cloning an existing flip box and editing the following fields for content to ensure the design flows throughout.

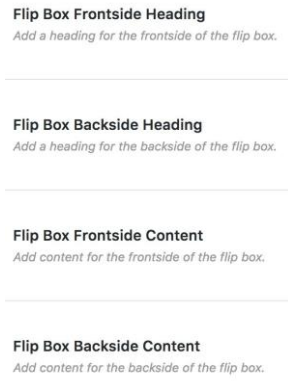



Figure 60 Flipbox Settings

The four sections in Figure 60 correspond to the text values for each of the flip boxes. If you wish to use a student's picture as the icon image, you will need to also change the icon image file, and possibly set the icon size as 60x60 although if you want a large image, simply increase the dimensions.

4.18. Photo Galleries

1. Click the Envira Gallery Tab in the Sidebar shown in Figure 61.
2. Select the Add New button
3. To create a gallery from:
 - a. Pre-existing WordPress photos, Click "Select from Other Sources"
 - b. Photos on your computer, Click "Select Files from your Computer"
4. Once your files have uploaded, Scroll down to see the images currently in your gallery.
5. To add a title or subtext to your images,
 - a. Click on the  Edit button for the image
 - b. Then edit the Title field to the text you wish to be displayed.

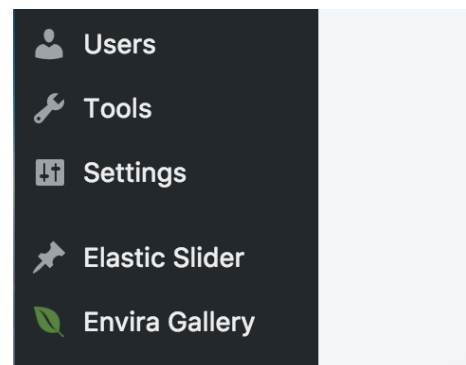
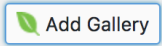


Figure 61 Sidebar Location of Envira Gallery

6. Navigate to and edit the page that you wish to insert the gallery and ensure that you are using the Default Editor.
7. Click the  button and select the gallery you want to use

4.19. Submitting a Help Request to VT Hosting

1. Navigate to [Web Hosting Support](#)
2. Fill out the form with as much information as available, including picture of the problems if available.
3. The support team should contact you within the next few business days.

5. Lessons Learned

This section reflects on the completed project and all of the processes that were conducted to complete it. It discusses the lessons that were learned during and after the project's completion. The following sections discuss the timeline of the project, some of the problems we encountered along the way, the solutions to those problems, and potential future work.

5.1. Timeline and Schedules

The Gantt Chart in Table 1 represents the actual timeline of our project that shows the generalized activities and the weeks in which they were completed. Our schedule was slightly changed, with permission from our client, from the original proposal which we did our best to adhere to.

Table 1 Gantt Chart Populated with our Project Information

Activity	January	February				March				April		
	1/29/17	2/5/2017	2/12/17	2/19/17	2/26/2017	3/5/17	3/12/17	3/19/2017	3/26/17	4/2/17	4/9/17	4/16/2017
Host Migration												
Word Press Setup												
Crawl Previous Website												
Acquire Previous Website's Assets												
Develop Website Navigation												
Complete All Page Migrations												
Correct Client Feedback on Initial Implementation												
Launch Website (Migrate DNS)												
Create Developer Manual and Tutorial for Client												
Usability Testing												
Regression Testing												
Acceptance Testing												
Performance Testing												
Website Refinements from Testing												

5.2. Problems and Solutions

One of the first problems we encountered during this project was in the initial steps of setting up the WordPress site. Since the site is hosted on Virginia Tech's hosting service, we are not provided with a C-Panel which allows us to make administrative changes. During the setup of WordPress, a number of changes need to be made to fully unpack the platform and set it up for access. To solve this problem we had to access the Virginia Tech hosting team and request that

they unpack the WordPress package on their end. Since they have full access, they were able to promptly address the issue and get the site up and running.

Another issue we had during the project was the selection of the WordPress theme. Our client had selected one of the many available themes for the site. However, once we started the development of the site and began creating pages and the structure, we realized the theme would not work. The theme was a very basic one, which did not have enough functionality to meet the requirements of our client. To solve this problem, we had to quickly research a better theme and propose it to our client. Since there was a cost associated with this theme, we had to act promptly in order to get the billing processed through the client. In the end, we were able to find a theme that had the right amount of functionality and a quality design.

The last major issue we had during the project was related to our .htaccess file. Some of the settings on the file were restricting us from uploading some files. It also created a problem with WordPress's permalinks. All of the pages required /index.php before the actual permalink. To solve these two issues, we needed to contact Virginia Tech hosting, because we did not have access to edit the .htaccess file. We were able to attach a new .htaccess file to the ticket and have the hosting team upload it to the directory. This solved the problems we were having and allowed us to move forward with the development.

5.3. Future Work

The migration of the web site in its entirety has been accomplished. Therefore, the only remaining work for the client is to maintain it with updated information, galleries, and people.

6. Acknowledgments

This section is for personal acknowledgements and for the individuals and groups who provided invaluable feedback and assistance throughout the process of building this website. The success of this project was dependent upon the following.

Karen Iannaccone

kareni10@vt.edu

540-231-6570

Karen Iannaccone was our point of contact for the VTCDD. She was involved in biweekly meetings and provided us with requirements and feedback throughout the development life cycle. She gave us information on the organization and was a voice for the organization's needs and desires.

Dr. David G.I. Kingston

dkingston@vt.edu

540-231-6570

Dr. Kingston is the director of the VTCDD, and was the product owner for the website. He worked alongside Karen Iannaccone and us to help finalize the requirements and design of the website. He was the final approver for all content and design going into the website.

Dr. Edward A. Fox

fox@vt.edu

540-552-8667

Dr. Fox is the professor for *CS 4624: Multimedia, Hypertext, and Information Access*, and was a resource throughout the semester. He provided insight into client interaction, software documentation, and project development.

7. References

[1] *WordPress.org*. Date Accessed-Web. 31 Jan. 2017. <<http://www.wordpress.org/>> WordPress was our main resource for our entire project as our client specifically requested that we use WordPress as our content management system. Our entire system was constructed using WordPress with additional functionality from external plugins.

[2] *Codex: User:FPP*. Date Accessed-Web 16 Mar. 2017.

<<https://codex.wordpress.org/User:Fpp>> This resource provided us with an example of what the overall architecture of a completed WordPress site looks like.

[3] *Avada*. Date Accessed-Web 3 Mar. 2017 <<https://avada.theme-fusion.com/>> The Avada Theme is what we used in association with WordPress to style our site in the manner that our client desired. Avada also provides an interactive tool that makes creating pages easier for the user.

Appendix A: Requirements & Design Report

A.1 Data Design

The following sections will expand on all of the data structures used throughout our project including internal, global, and temporary data structures.

A.1.1 Internal Software Data Structure

For our project we are using [WordPress](#), which is a free and open-source content management system [1]. WordPress is based on PHP and MySQL.

A.1.2 Content Migration Strategy from Legacy System

Considering we are moving from a legacy system written using the Ensemble CMS to a WordPress CMS, there are a few considerations with regards to data consistency we need to ensure as we move to our new system. We must make sure we preserve all existing content from the Ensemble site. The current strategy in place is to store the files from the web server on a cloud drive, and to utilize web crawlers to preserve the content information that exists on the website currently. This plan allows us to put our website live as soon as we finish the content move, and have a cloud based backup of all initial site content.

A.2 Architectural and Component-Level Design

The program architecture for this project uses WordPress version 4.7.2 hosted on Virginia Tech's servers.

A.2.1 System Structure

WordPress' architecture is a front controller, routing all requests for non-static URI's to a single PHP file which parses the URI and identifies the target page. Figure 62 displays the system architecture that WordPress employs. The four main areas include User/Display, Templates/Themes, WP Engine, and WP Backend [2]

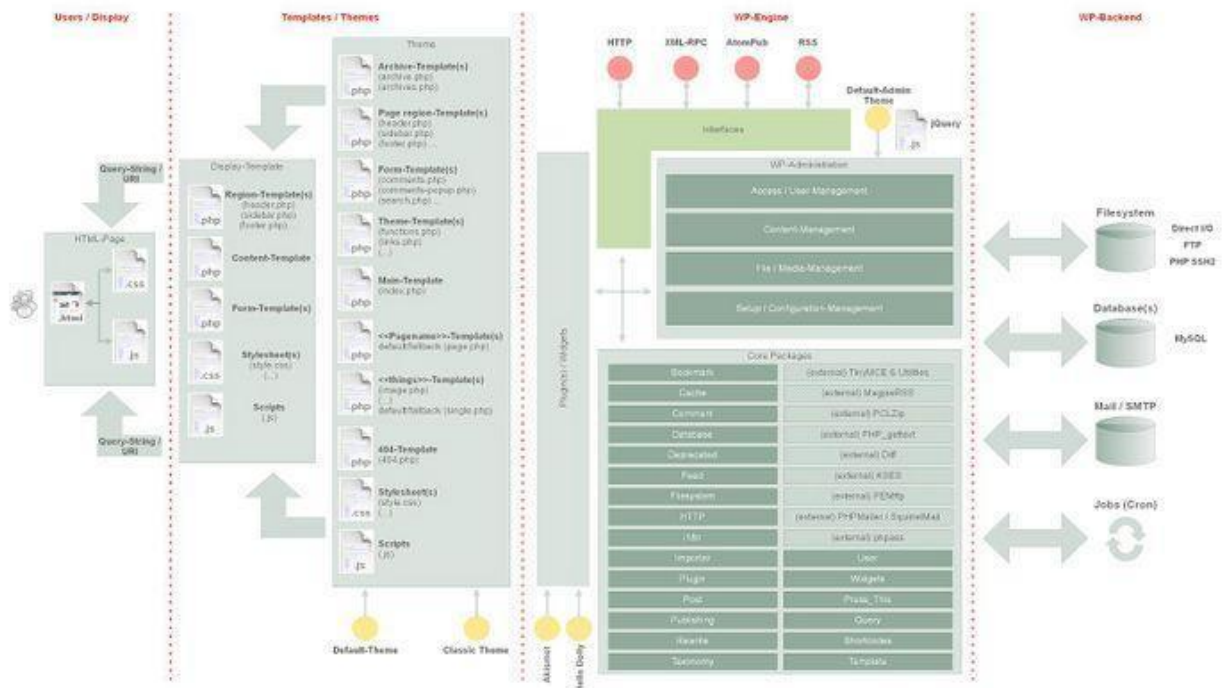


Figure 62 WordPress System Structure

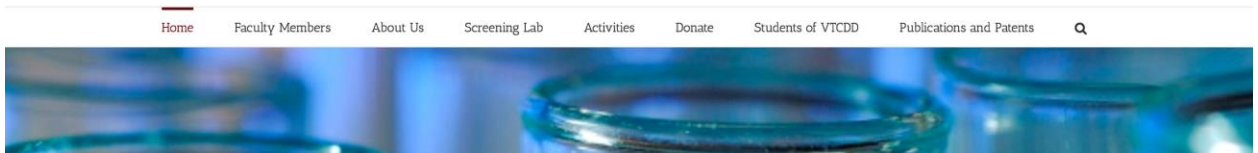


Figure 63 Homepage for the Virginia Tech Center for Drug Discovery

Figure 63 is a photo of the homepage for the Virginia Tech Center for Drug Discovery, and the tabs related to the architecture of the site. By using WordPress' software and architecture, we will be revamping the Virginia Tech Center for Drug Discovery's website. The architecture of our site will include:

- A home page where users can access everything on the site.
- Faculty Members page that will give a brief description of each member.
- About-us page that will explain what the VTCDD does and how to contact the Faculty who work directly with the VTCDD.
- A screening lab page that will explain specific projects and equipment that the VTCDD is using.
- An Activities page that will have archives of photos from events that the VTCDD holds, and is involved with.
- A Donate page that allows users to donate to the VTCDD.
- A students-of-VTCDD page that will be similar to the Faculty Members page, but will describe what graduate students are involved with the organization.
- A Publications and Patents page, that will describe any current Publications and Patents that involve members of the VTCDD.

A.3 User Interface Design

We will be using a pre-existing WordPress theme to enable us to rapidly theme our website, due to the limited time we have to launch. Our client has selected the [Avada](#) WordPress theme, which offers us a responsive design and a plethora of prebuilt components [3].

A.3.1 Description of the User Interface

Since we have not fully implemented the user interface we do not have a concrete design but we have a baseline level of expectations between us and the product owner.

A.3.1.1 Objects and Actions

There are several objects that need to be created for our client. In order to make this system easily usable for our client we will create empty templates for each piece of content, which the client can clone and fill with specific information.

- Biographies for each member
- News articles
- Blog posts
- Patents and publications
- Basic page for additional content

A.3.2 Interface Design Rule

Figure 64 shows the theme that has been chosen by our client. The name of the theme is Avada and has a very professional look tailored towards businesses. This will provide a responsive design and keep the design consistent across the site.

Site Layout & Width:
Choose any pixel or % value, boxed or wide mode, content area width, single/dual sidebar width, responsive, and more!

Header Area:
7 header designs, top/left/right positions, background color or image, border colors, padding options, sticky headers, social icons, logo positions, independent width, and more!

Menus:
Several menu locations, mega menu with widget areas, mobile menus, shop & search icons, customization & typography controls, padding, unlimited menus and more!

Page Title Bar (hidden):
Visibility per page/post, background image or color, border colors, height control, custom titles & subheads, typography control, search bar, breadcrumbs and more!

Fusion Builder:
Over 50 shortcodes with 100+ options that are all controlled easily by Fusion Builder's drag and drop system. Take full control over styling & layout. Choose multiple design styles and more!

Footer Area:
1-6 column layout, background image or color, parallax footer, border control, padding options, visibility, and more!

Copyright Area:
Custom text links, social icons, background color, border color, visibility, padding options, and more!

Sliders:
4 premium responsive sliders, loaded with custom options, full size control, supports multi-media formats, unique sliders per page, fallback images, slider position, and more!

Page Content Area:
1-6 columns, custom background images or colors globally or per page, padding options, control column gutter size, page templates, and more!

Sidebars (hidden):
Choose single/dual or no sidebars throughout the theme, set custom width of both, assign globally or per page/post, and more!

Widgets Sections & Widgets:
Create unlimited widget sections to display widgets virtually anywhere on your site (mega menu, footer, sidebars, etc), even directly in page content. Over 10 custom widgets to display with multiple customization options and more!

The screenshot shows the Avada website homepage. At the top, there is a navigation menu with links for Home, Features, Shortcodes, Pages, Portfolio, and Blog. The main content area features a large hero section with the text "#1 Selling WordPress Theme" and "Join The Avada Community". Below this, there are three columns of feature highlights: Fully Responsive, Parallax Scrolling Effect, and Full Size Control. Further down, there is a section titled "Amazing Fusion Builder To Create Unique Pages" with a list of page templates. The footer area includes a copyright notice, recent posts, recent tweets, and recent works. The entire page is annotated with green callout lines pointing to various elements, each accompanied by a descriptive text box.

Figure 64 Avada Website

A.4 Restrictions, Limitations, and Constraints

We have to be sure to create a site that is usable and understandable to an end user who is not fully versed in software development. We will need to build a well-documented system that is self-explanatory and easily operable. One additional limitation for this project is the short deadline of March 30th. At this date, we need to have a site that can be published to take the place of the current website. Post launch, we will be focusing on creating user documentation, to help our client better understand how to own and operate the new system. Besides documentation, we will also be conducting usability testing to better understand how users experience our website, and hopefully provide improvements in general user experience. Having additional high quality photos that are relevant to the site will also be a limitation, as we lack uncompressed photos, and as a result many images look grainy and pixelated. To improve on the photo quality, we are reaching out to the Virginia Tech photo vault, to receive unaltered photographs, to hopefully improve the visuals on the website.

A.5 Testing Issues

In order to test our product as we go along, we will continue to check in with the client in order to make sure that the design, and content of the website are appropriate and in line with their ideas. Through our bi-weekly meetings we will be testing that the data and information on the new website is matching the client's requirements for design and functionality. Once we launch at the end of March, we will be conducting usability testing to understand how the user is able to navigate through and find necessary information on our website.

A.5.1 Classes of Tests

We will not have any white box testing, as we don't have control over the software that WordPress uses. We will focus on user interaction testing, to refine our user experience to make sure we have a well-designed product. We want to make sure users can find information regarding VTCDD faculty, projects, and students as well as ensure that people can find the social media and donation options. We will create surveys for testers to attempt to find information across the website and use time to evaluate how easy or difficult different information is to find. To conclude the testing, we will ask testers how they felt about the site as a whole and if they had any criticism or feedback.

A.5.2 Expected Software Response

The website is expected to provide users with adequate information about the Virginia Tech Center for Drug Discovery, its employees and the research being done. We expect users to be able to learn about various faculty members, find social media and donation links, learn more about the goals of VTCDD, get a list of publications and patents for various staff, and find information about various grants associated with VTCDD.

Appendix B: Implementation Report

B.1 Project Progress to Date

After consulting with our client, Karen Iannaccone, we have changed our projected timeline to better meet her needs. Our original project launch date was March 15 because that is when the university stops supporting the previous Content Management System (CMS) and switches to the new Ensemble CMS. The previous version of the VTCDD site will continue to be hosted by the university, however, our client will not be able to make any changes. For that reason, we shifted our project timeline back approximately two weeks so that we can iteratively update the site based on the client's preferences.

B.1.1 Project Preparation

Before we could begin developing, we needed a better insight into the structure of the old website and all of the pages that needed to be recreated. To achieve this, we used a PHP web crawler to crawl within the vtccd.science.vt.edu domain and create a map of all site pages and their interconnectivity. This revealed pages that were not as easily accessible as the client originally intended and have since been amended.

B.1.2 Page Migration

In order to fully migrate the site, we needed to first find all of the content and pages. To do this, we used a web crawler that searched through the entire site and found all of the pages. From the web crawler, we were able to generate a list of the URL's for each page. The next step was to split up the page migrations between the team; see Appendix D.

The old site contained much content, including pictures and documents. We provided our client with a Google Drive folder to upload all of the content. This gave us full quality versions of the content.

During the migration, we were able to restructure some of the data on the pages.

On the old site, there were multiple columns on a page with an overwhelming amount of text. We were able to find more innovative ways to display the content in a less overwhelming manner. This included using accordions to hide and split up content. We also used modals, which, when clicked, present a popup with more information. This restructuring gave the site a much better flow.

B.1.3 Client Feedback

We met with our client on March 14th in order to ensure that our quality of work was meeting the expectations that had been set. She was happy with how clean everything looked and how we had already managed to migrate every single page from the previous site to the new one. The majority of the changes she requested were very small and we will have no problem addressing her concerns before our agreed go-live date of March 30th. In Figure 65, we have a screenshot of direct feedback from our client that she provided us.

Client Feedback for CS4624 Project: Site migration of VTCDD Website
4/11/2017

The five members of this project group migrated the site timely.

Dr. Kingston is very happy with the results, and has received positive feedback from other members of the VT Center for Drug Discovery.

The project group corrected all requested edits within a few hours of being sent the information.

Hugh has responded to all of my emails promptly.

The project group has provided me a manual which I am beginning to review, and has been helpful in my learning the new CMS.

So far, this has been an easy and effective group to work with.

Best, Karen Iannaccone

Figure 65 Feedback provided to us by our client, Karen Iannaccone, on her

overall satisfaction with working with us

B.1.4 Future Usability Testing Plan

Since we have begun implementing most of the pages on the website, we discussed usability testing and goals with the client. We established that we want to test how easily users can navigate through the site and find critical pieces of information. As we get closer to launch, we will discuss with the client, regarding which information we need to test. As feedback comes in from testers, we will review scores, and see if there are any necessary changes, such as header layouts, or navigation menu changes that need to be made in order to improve user interaction.

B.1.5 Project Implementation Plan

Table 2 Project Implementation plan with information like percentage complete, expected completion, and who's assigned to the task

Task	Percent Complete	Status	Started	Expected Completion	Actual Completion	Assignment
Host Migration	100	Completed	January 31	February 14	February 2	AJ
WordPress Setup	100	Completed	February 2	February 14	February 14	AJ
Theme/Design Selection	100	Completed	February 10	February 14	February 13	Reid
Map Site to Determine Interconnectivity (Web Crawl)	100	Completed	February 28	February 28	February 23	AJ
Acquire Assets	100	Completed	February 28	February 28	February 23	Karen Iannaccone (Client)
Site Navigation Development	100	Completed	March 1	March 15	March 2	Reid
About Us Page Migration	100	Completed	March 13	March 15	March 13	Reid
Activities Page Migration	100	Completed	March 14	March 15	March 14	Reid
Donate Page Migration	100	Completed	March 1	March 15	March 14	Alex
Faculty Member Page Migration	100	Completed	March 1	March 15	March 14	Reid/AJ/Jerry/Hugh
Home Page Migration	100	Completed	February 28	March 15	February 28	Reid
Image Gallery Migration	100	Completed	March 14	March 15	March 14	Hugh/Jerry/AJ
Member Collaborations Page Migration	100	Completed	March 1	March 15	March 1	Reid
Publications and Patents Page Migration	100	Completed	March 1	March 15	March 14	Alex
Screening Lab Page Migration	100	Completed	March 13	March 15	March 13	Reid
Students Page Migration	100	Completed	March 1	March 15	March 14	Alex
Implement Template Pages for Client	100	Completed	March 12	March 28	n/a	AJ/Alex
Correcting Client Feedback on Initial Implementation	100	Completed	March 14	March 28	March 27	AJ/Hugh
Launch Website	100	Completed	March 29	March 30	March 30	AJ
Documentation Manual and Tutorial for Client	100	Completed	March 31	April 3	April 2	AJ, Alex, Hugh, Jerry, Reid
Usability Testing	100	Completed	April 4	April 11	April 10	Reid
Regression Testing	100	Completed	April 3	April 11	April 9	Alex
Acceptance Testing	100	Completed	April 3	April 11	April 7	Jerry
Performance Testing	100	Completed	April 3	April 11	April 4	AJ
Usability Test Refinements	25	In Progress	April 11	April 20	n/a	Reid
Regression Testing Refinements	25	In Progress	April 10	April 20	n/a	Alex
Acceptance Test Refinements	25	In Progress	April 8	April 20	n/a	Jerry
Performance Test Refinements	25	In Progress	April 5	April 20	n/a	AJ

Table 2 gives our implementation plan that outlines tasks and requirements to create a high performing and useful website. With each task we recorded the percentage complete, the status of the task, when it was started, when it was finished, and who was assigned to it. This allowed us to properly plan out what needed be done, see if we're working efficiently, and hold members accountable for their workload.

We can see all of the tasks have been started, 24 out of 28 have been completed, which leaves 4 left to finish: launching the website, refinements, documenting a manual for our client, and doing usability testing.

By using a web crawler we found 16 main pages that were used on the current website and split these main pages among our 5 group members, shown in Figure 66.

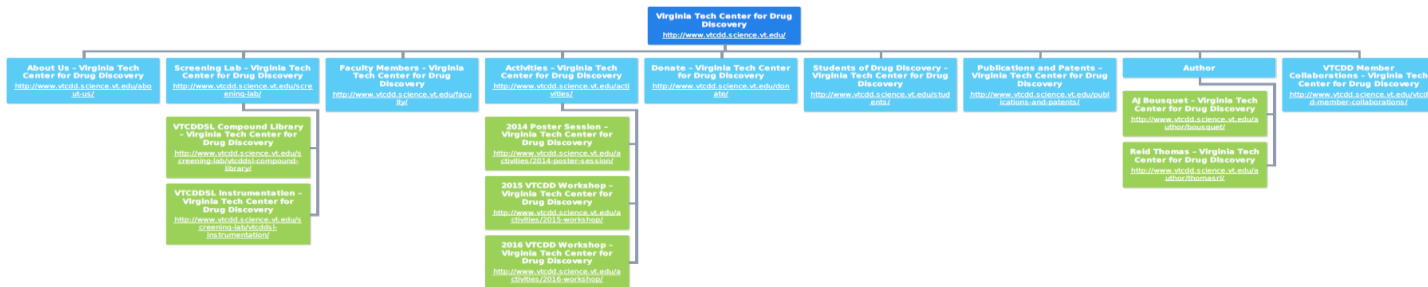


Figure 66 Site map for the Virginia Tech Center for Drug Discovery

Appendix C: Prototype, Refinement, and Testing Report

C.1 Prototyping

Our first prototype was designed to display all of the old content on the website, being as similar to the original website as possible. The plan was to then refine the initial website to utilize new features we gained by swapping over to WordPress. Some of the initial prototypes lacked organization of content and smooth design. We addressed these issues when we performed refinements, making the site more user friendly.

C.1.1 Homepage Prototype

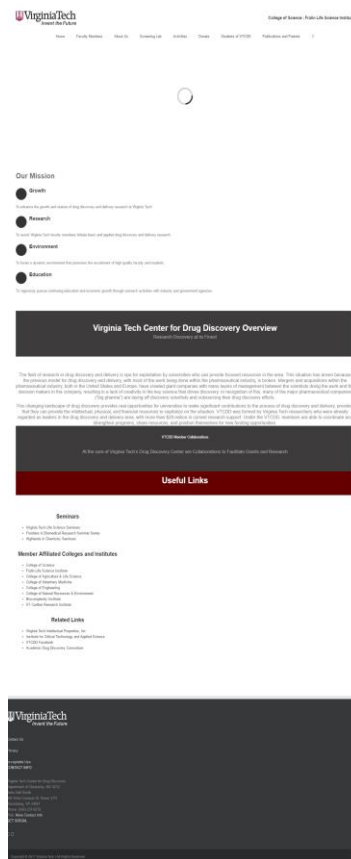



Figure 67 First prototype of homepage

Figure 67 is the prototype for the initial homepage. We needed to display critical information in an organized fashion in order to give a visitor a quick overview of what our website represents: the Virginia Tech Center for Drug Discovery. Our product owner wanted us to be sure that we listed the four main pillars of the Virginia Tech Center for Drug Discovery as well as a brief summary of their mission. It was determined through meetings with the product owner that we should also add a series of useful links.

C.1.2 Faculty Members Page




VirginiaTech
Invent the Future

College of Science | Fralin Life Science Institute

Faculty Members
Home / Faculty Members

Josep Bassaganya-Riera



Dr. Bassaganya-Riera, in collaboration with Dr. Hontecillas, directs the Nutritional Immunology and Molecular Medicine Laboratory (www.nimml.org), a cutting-edge research laboratory that conducts translational research aimed at developing novel therapeutic and preventive approaches for modulating immune and inflammatory responses. The NIMML combines computational modeling, bioinformatics approaches, immunology experimentation, and pre-clinical and clinical studies to better understand the mechanisms of immune regulation and inflammation at mucosal surfaces and ultimately accelerate the development of novel treatments for inflammatory, infectious and immune-mediated diseases. The NIMML has received over \$12 million over the last five years to conduct basic and translational research in inflammation and immunity.


Development of Novel Therapies for Gut Inflammatory Diseases. Inflammation is at the core of most human diseases, including chronic, infectious and immune-mediated. In the gut, chronic immune-mediated diseases such as inflammatory bowel disease (IBD) are initiated and maintained by defective immunoregulation. Current therapies against IBD are modestly successful and with significant side effects. Interestingly, about one third of current pharmaceuticals have a natural origin. The NIMML reported for the first time that the botanical compound abscisic acid (ABA) exerts potent anti-inflammatory effects in mouse models of gut inflammation. Our group and others provided evidence in support of a role of lanthionine synthetase component C-like protein 2 (LANCL2) as a putative novel target for the binding and signaling of ABA. LANCL2 has emerged as a promising new therapeutic target against inflammation. We are actively screening compound libraries for their ability to bind to LANCL2 and suppress inflammation. We have recently discovered that the bis(benzimidazo)terephthalanilides class of anti-inflammatory compounds can also bind to LANCL2 and elicit anti-inflammatory effects. We are currently planning ADME, pharmacokinetic/pharmacodynamic and toxicology studies to develop and improve the oral delivery of this and other classes of compounds.

Development of Novel Vaccines and Immune Therapeutics for gut Infectious Diseases. I am also the Principal Investigator of the Center for Modeling Immunity to Enteric Pathogens (www.modelingimmunity.org) a NIAID-funded \$10.6 million Center of the Modeling Immunity for Biodefense program. As a part of this program we will develop novel vaccines and immune therapeutics. Our group has the expertise, tools and know-how of bioinformatics and immunology and a demonstrated track record in pre-clinical and clinical research and product development.

In 2008, Dr. Bassaganya-Riera founded BioTherapeutics, Inc. (<http://biotherapeuticsinc.com>) a biotechnology company focusing on development of novel anti-inflammatory and anti-diabetic compounds that target the novel LANCL2 pathway.

<http://www.vbi.vt.edu/people/people-profile/josep-bassaganya-riera>

David Brown



My research group is fascinated by how our cells make energy. Our research is primarily focused on mitochondria, intracellular organelles responsible for generating most of the body's energy from food. Dysfunctional mitochondria have been implicated across a number of diseases. We are interested to understand how and why mitochondria become dysfunctional, and then develop therapies that can improve/restore mitochondrial bioenergetics. We primarily study heart disease, although over the last 10 years we have researched mitochondria across many different tissues and pathologies. Our specific approaches include mitochondrial respiration screening assays, high resolution respirometry, and fluorescence imaging.

Development of novel therapies for heart disease: In heart disease and following a heart attack, mitochondrial energy production declines and production of reactive oxygen species goes up. Dr. Brown is co-PI on an NIH R01 grant to study the molecular underpinnings that cause this bioenergetic demise during myocardial infarction. We are particularly interested in how small peptides that target mitochondrial membranes may improve bioenergetics by "clustering" the electron transport chain proteins together.

Development of therapies for Complex I diseases: In both genetic mitochondrial disease as well as common acquired diseases, complex I of the electron transport chain can become impaired. We are helping to develop several coenzyme-Q mimetics that appear to effectively "bypass" dysfunctional components of complex I. These studies include partnerships with several collaborators in industry and NIH small business grants.

<http://www.hnfl.vt.edu/people/faculty/gpf/brown.html>

Figure 68 The initial prototype for the Faculty Members page

Figure 68 is the initial prototype for the faculty members page. The original

design we based off, involved an accordion style list of drop downs that would then display information related to the associated professor. The current implementation, prior to refinement for WordPress, lacks the accordion dropdown and has separate sections for each faculty member, ordered alphabetically. Our refinement goals are to utilize an accordion style display, and the product owner has asked to make the list of faculty members filterable based on focus area.

C.1.3 Donation Page Prototype

Giving to VA Tech Center for Drug Discovery

Contributions may be made to the VT Center for Drug Discovery and mailed to the address below. Checks should be made payable to the "Virginia Tech Foundation Inc." and include "VT Center for Drug Discovery Fund 876078" in the memo section.

Virginia Tech
Office of Gift Accounting
University Development (0336)
Blacksburg, VA 24061

OR

To make an immediate contribution using your credit card, you may use Virginia Tech's secure (on-line form) or contact the Office of Gift Accounting at (800) 533-1144.

For more information or to learn about other ways to give, please contact Jenny Orzolek, Director of Development for the College of Science, by phone at (540) 231-5643 or by e-mail at jorzolek@vt.edu.

When donating online, please follow these steps:

- Select an area: "College of Science"
- Select a fund: "Other"
- Under Designation, please type in the following: "VT Center for Drug Discovery Fund 876078"

[Donate Online](#)

Figure 69 Initial prototype for the Donation page without styling applied

Figure 69 represents the first iteration of the donation page. We decided for an initial release all we would need is the original text and a button linking to an external website allowing for people to process donations online. This carbon copy from the original website was sufficient for the initial iteration of our prototype. After some discussion with the product owner, we decided on some changes for the refinement phase, such as content alignment and some additional design enhancements to allow for a better content flow.

C.1.4 Publications Prototype



Figure 70 Initial prototype for the list of faculty publications without styling

Figure 70 is the initial display for faculty publications. It is a select snippet of one faculty member's list of publications. Below the publications section we include a button that links to a faculty members distinct page which will include their biography and additional information. As we prototyped this page, we realized the length and readability would become difficult for users seeking information quickly. We found content discrepancies such as only certain faculty members having web pages. We decided to address these issues in the refinement phase, through use of modals and other WordPress bundled features.

C.1.5 Faculty Member Patents



Figure 71 Initial prototype for the patents made by faculty members

Figure 71 is the original prototype for the patent section for faculty members. All we decided to do was an immediate content copy from the old website, to use simple text sections on the new website. We saw some issues with this approach, such as the page length becoming exceedingly long and the text blurring together, as issues we would want to address during the refinement phase.

C.1.6 Students of VTCDD

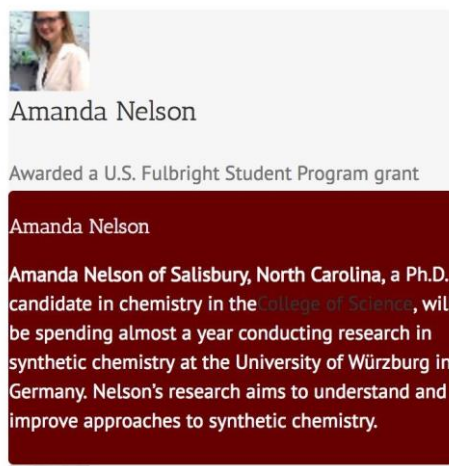


Figure 72 Prototype for documenting students' work with VTCDD

Figure 72 is a snippet of one student we created for the prototype of Students of VTCDD page. We had decided during the prototyping of this page to apply some additional coloring to items in order to better separate content. The above screenshot has a student name and a small blurb about a recent accomplishment, and then below has a more detailed description of the student's achievements through the VTCDD program. We determined a more interactive approach to this page, utilizing some WordPress add-ons would allow for a more beneficial user experience during the refinement page.

C.1.7 Deviation from Implementation Plan

Our implementation plan laid out the groundwork for each page we needed to develop in order to achieve a full content migration from the old website. As we began our initial prototype, we realized it would be possible to achieve our implementation goals without satisfying the needs of the client. We determined that it would be better to redefine what it means to have a page implemented, and then incorporate refinement into the implementation process. This created larger implementation goals which caused us to deviate from the original implementation plan.

C.2 Refinement

Our refinement stage is focused on modernizing the content that had been migrated from the old website. During our initial prototype, we made note of areas where we felt we could use the power of WordPress to improve the design and flow of various pages within the new website. We used our refinement goals to help select a specific WordPress theme, that came with features we could map to refinement goals, such as modals, flip boxes, and accordion filters.

C.2.1 Refinement from prototype

We met with our client on 3/28/17, and we made sure to document all comments made by Mrs. Iannaccone about the development process. In addition to noting her comments, we also were given a document with Dr. Kingston's opinion of the site. All of the changes listed below were important based on the client's wants and needs, and were implemented as soon as possible.

- Replace various broken faculty links
Reasoning: Many of the links on the faculty members page weren't properly redirecting to another website.
- Replace Photo on "About Us" page
Reasoning: The original photo we used on the "About Us" page was outdated, and the client wanted us to use a newer photo of the department.
- Include further instructions on the "Donate" page
Reasoning: our client felt that the way the donate page was formatted was very confusing for anyone attempting to donate to the VTCDD. She requested that we add instructions letting the user know how to select a fund they were going to donate to.
- Abbreviate the faculty member categories
Reasoning: Originally the categories for the departments that faculty members worked in were full titles (i.e., Biochemistry). However we found that this made the tabs overlap two rows. This was not aesthetically pleasing so we decided to abbreviate the categories (i.e., Biochem).

- Add a link to the VTCDD Facebook
Reasoning: Mrs. Iannaccone wanted user's to be able to easily access the VTCDD Facebook page in order to keep up with her updates.
- Remove carousels from "Activities" page
Reasoning: Virginia Tech emailed our client and let them know that they did not want any carousels on the website as they can cause problems when a user accesses the website on smartphone. We replaced the carousels with a gallery of the images.

C.2.2 Homepage Refinement

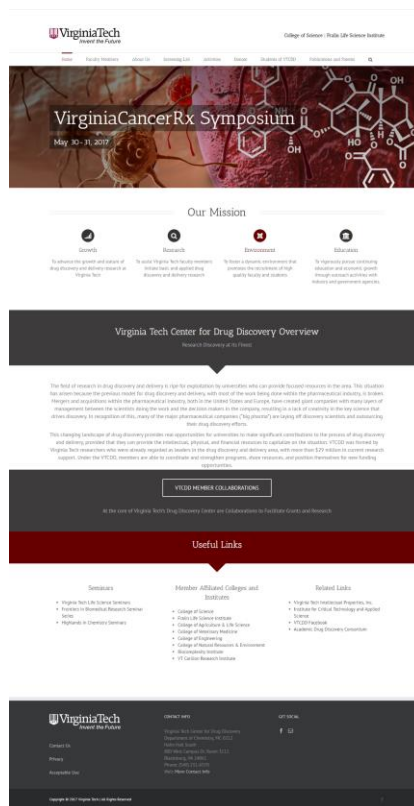


Figure 73 Refinement of the Home Page

Figure 73 is the refined homepage with the new product owner approved design. We took the existing content, and made it more presentable to page visitors by implementing a modular design with a Virginia Tech centered color scheme. The

aim was a visually appealing and easily interpreted web page. Some key refinements were a header image slider, and an improved visual display of the four primary pillars of the VTCDD.

C.2.3 Faculty Members Page Refinement

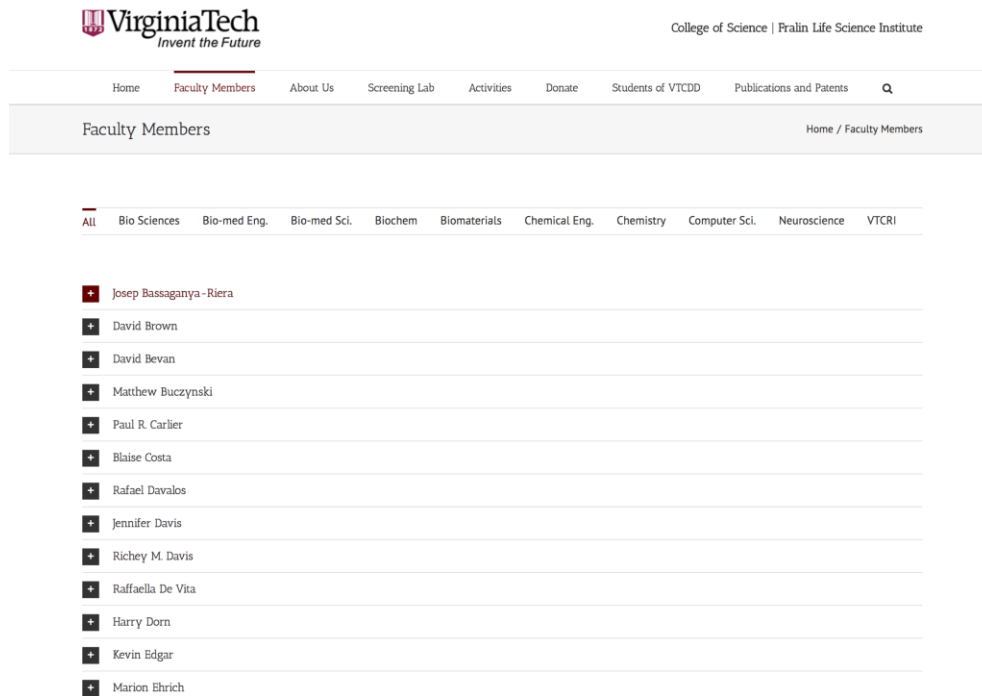


Figure 74 Refinement of the Faculty Page, using accordion menus to consolidate faculty information

Figure 74 is the refined “Faculty Members” that uses the Avada FAQ accordion. It allows us to have collapsible and filterable profiles for each faculty member. Before this refinement there was a long page with full profiles from each member, which would require a lot of scrolling to get to faculty members at the bottom. This is not only faster but also much better organized.

C.2.4 Donation Page Refinement

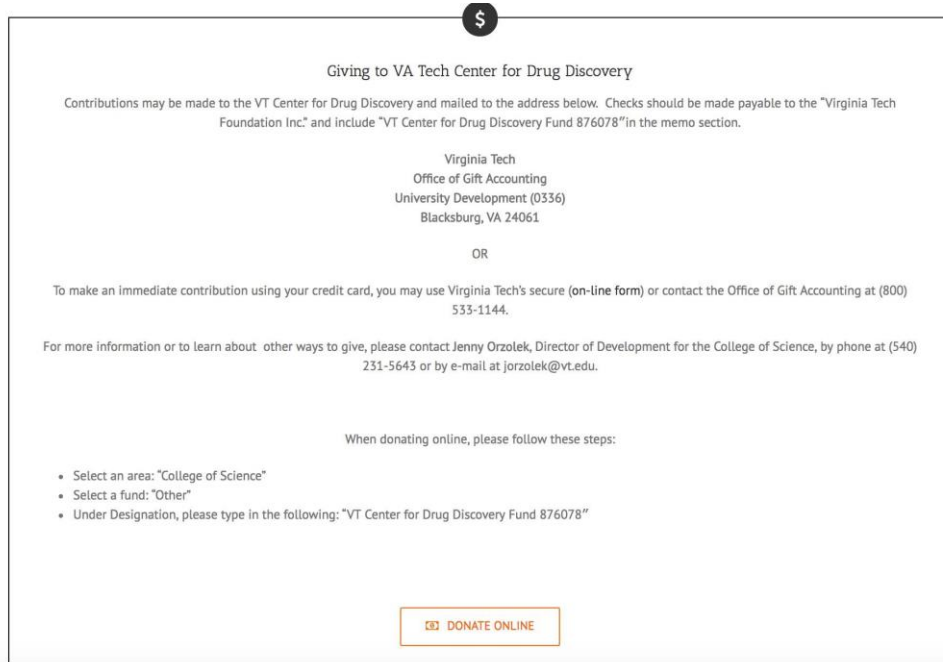


Figure 75 Refinement of the Donation Page

Figure 75 is the new view for the donation page. We stuck with the content box, but decided to add some images, text centering, and a header icon to provide a more visually appealing page. We added information on how to donate online in order to meet product owner feedback. The key focus for this refinement was to utilize text alignment to allow for increased readability.

C.2.5 Faculty Member Publications Refinement



Figure 76 A button to display a faculty member's publications.

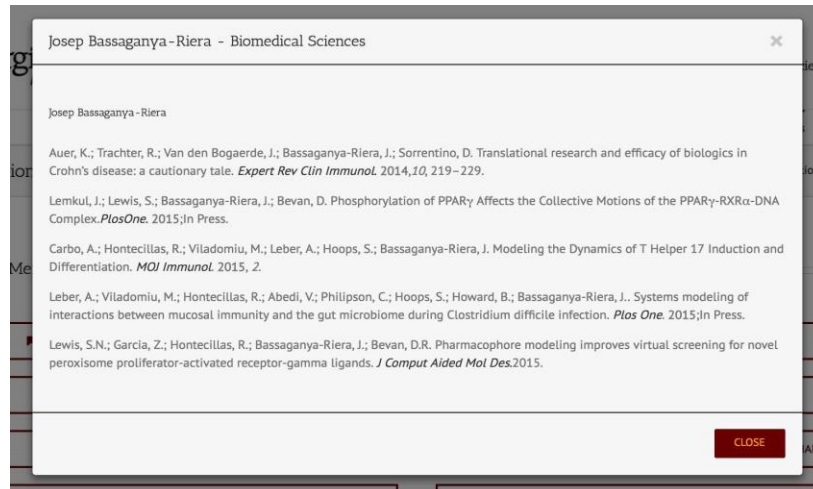


Figure 77 The modal view for a faculty member's publications.

The initial prototype for this section of the publications and patents page led to some undesirable page lengths and content display, as well as presented us with some issues about content consistency between faculty members. After analyzing possible solutions, we determined modals yield the best solution, shown in Figures 76 and 77. They allow us to display faculty members' publications in the same view. Our product owner was pleased with the overall refinement and ease of use of the publications section.

C.2.6 Faculty Member Patents Refinement

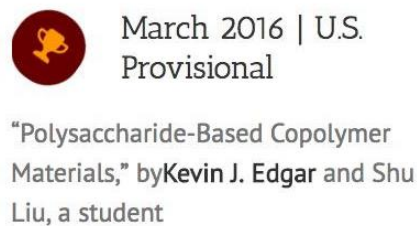


Figure 78 The card showing the date, patent winner, and explanation of the faculty member patent

The initial “Faculty member patents” page had very bland sentences simply describing the patent that a faculty member was given. With this card attribute shown in Figure 78, this information becomes more organized. Also, we could add a symbol (the trophy in maroon and orange) to catch a user’s eye.

C.2.7 Students of VTCDD Page Refinement

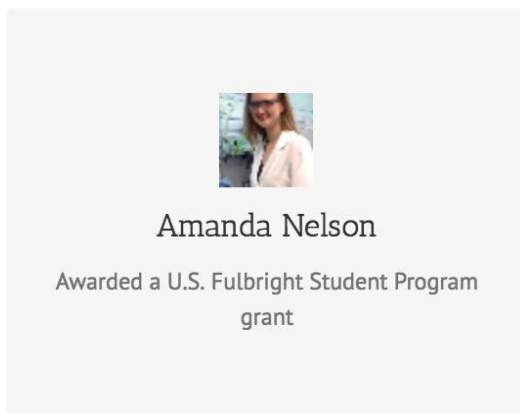


Figure 79 The front side of the flip box that shows a student's picture, and award before the user brings their mouse over the box

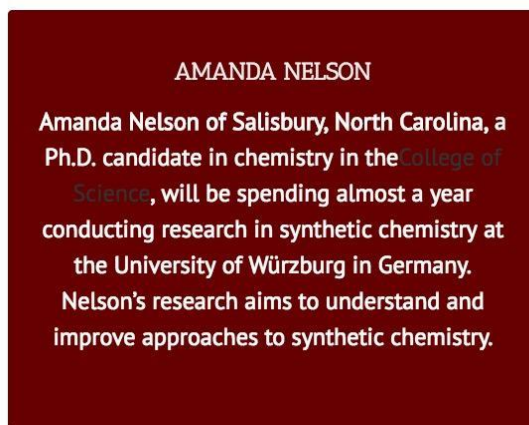


Figure 80 The back side of the flip box shown when a user brings their mouse over the students' award description.

The initial prototype for this webpage had the student's name, picture, and description right above the small explanation of their award. This refinement allows for a de-cluttered version of the same information, where a user can find out more information if they want to. It also allows for us to show more information per page, and allows for less scrolling to get to a desired patent explanation.

C.3 Testing

C.3.1 Testing Plan

After the migration of the VTCDD site to the new system and initial refinements made, we conducted testing. We completed testing in a several different areas including regression, usability, performance, and acceptance. Each of these areas covers a different aspect of the testing process to make a complete testing process. During the testing process, we documented the results for further refinement. The different testing procedures are described below.

C.3.1.1 Regression Test

Since the site was migrated to a new system, a full regression test needed to be completed to ensure that the full functionality of the site was in place. We want to ensure that the content is all in place and that all of the features are still intact. In order to complete this test, we developed a form for each team member to complete for each page. To complete the form, the team member would navigate to the VTCDD site and perform the listed tests for each particular page. Table 3 shows what our Regression Testing form looked like.

Table 3 Regression Testing form for Team Members

Page Test	Status (P/F)
Does the styling match the defined style format	
Do all images load properly	
Do all links work properly	
Do all features such as accordions, graphics, photo carousels, pop ups or dropdowns work properly	
Do the tests work in various browsers (Google Chrome, Firefox, Safari, Internet Explorer)	
Does the page's mobile version match the defined style format	

C.3.1.2 Acceptance Test

To ensure that the site's migration matched the requirements of our client, we completed an acceptance test. This was completed by members outside of our team to ensure the expectations were met. Each requirement was measured on a scale of 1-3, with 1 being not met, 2 needs improvement, and 3 being met. The following acceptance form in Table 3 was used.

Table 2 Acceptance Test form for test users of site

Requirement	Accuracy
Updates should be able to be completed with ease	
Client has an understanding of the website's backend	
Website has an inviting look and structure	
The site has a clean design that still displays useful information	
The website has an easy to use faculty sorting structure	
The website is easy to navigate	
Information should be easy to find (i.e. Publications, Student news)	
Donation information should be easy to find and understand	
All pictures from events are formatted nicely	
Pictures are easy to upload	
Website should load quickly	
Website has a news section for events and professor updates	
Website links to social media (i.e. Facebook page)	
Website has functionality for photos and videos	

C.3.1.3 Usability Test

To ensure that the website meets the project's usability standards, each of our group members complete this testing. We listed a number of actions for each user to complete, which are listed below. We noted their actions, issues, feedback during the process, and the time it took to complete.

- Navigate to the David Kingston's faculty information
- Navigate to the VTCDD Member Collaborations
- Navigate to the Contact Page
- Navigate to the Goals of the VTCDD

- Navigate to the 2016 VTCDD Workshop photos

C.3.1.4 Performance Test

To ensure the efficiency of the site we performed numerous performance tests. These tests included PageSpeed Score, YSlow Score, fully loaded time, page size, number of requests, and time to first bite. We also completed some benchmark tests using Google Chrome developer tools.

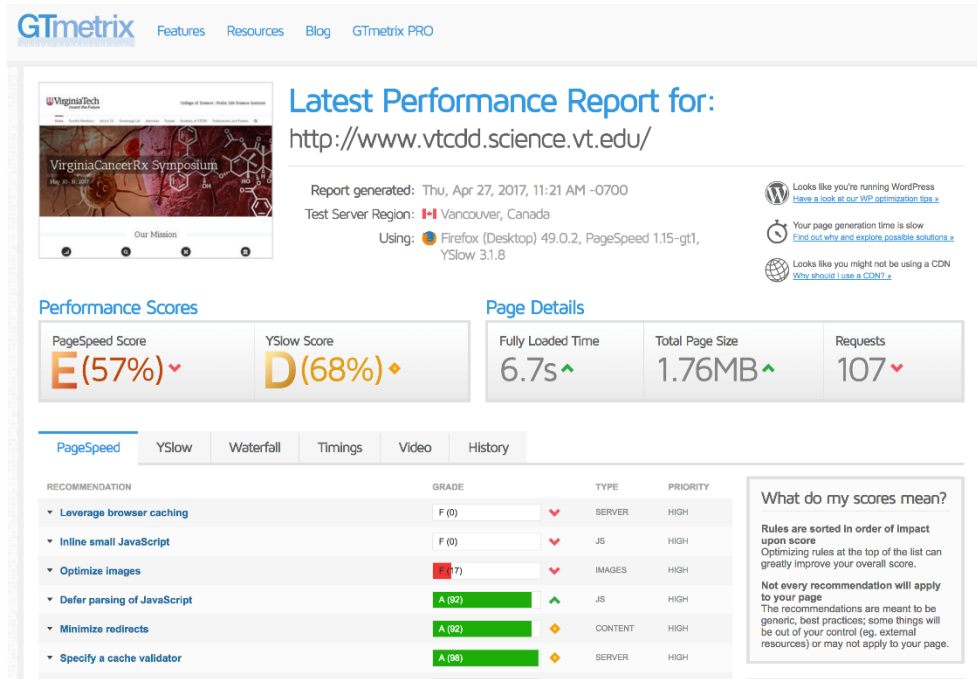


Figure 81 GTmetrix Performance Test Results for the VTCDD Website

Figure 81 shows that our grades for the GTmetrix Tests were fairly low. However when considering the constraints of the project, such as the hosting service being routed through Virginia Tech, and the inefficiency of WordPress as a whole, there were not a lot of possible solutions to improve our ranking.

Appendix D: Page Assignments

Reid

1. <http://www.vtcdd.science.vt.edu/index.html>
2. <http://www.vtcdd.science.vt.edu/People/People-Directory-Multi-brief.html>
3. http://www.vtcdd.science.vt.edu/About_Us/About.html
4. <http://www.vtcdd.science.vt.edu/VTCCDSL-Page/VTCCDSL.html>
5. <http://www.vtcdd.science.vt.edu/VTCCDSL-Page/Instrumentation/VTCCDSL-Instrumentation.html>

Alex

6. <http://www.vtcdd.science.vt.edu/VTCCDSL-Page/Compound-Library/VTCCDSL-compound.html>
7. <http://www.vtcdd.science.vt.edu/Events/Events-General.html>
8. <http://www.vtcdd.science.vt.edu/Donate/Donate.html>

Jeremiah

9. <http://www.vtcdd.science.vt.edu/Students/Students.html>
10. <http://www.vtcdd.science.vt.edu/Publications/Publications-Multibrief.html>
11. <http://www.vtcdd.science.vt.edu/Homepage/Contact.html>

AJ

12. <http://www.vtcdd.science.vt.edu/Events/2015-PosterSession/2015PosterSession.html>
13. <http://www.vtcdd.science.vt.edu/Events/2016-Workshop/2016-VTCDD-Workshop.html><http://www.vtcdd.science.vt.edu/Events/2015-Workshop/2015-Workshop.html>
14. <http://www.vtcdd.science.vt.edu/Events/Workshop/Event-Workshop-2014.html>

Hugh

15. <http://www.vtcdd.science.vt.edu/Events/2014-PosterSession/Event-Poster.html>
16. <http://www.vtcdd.science.vt.edu/Events/Poster-Session-2013/Events.html>

Appendix E: Initial Implementation Progress Report Meeting Notes

VTCCDD Meeting

March 14, 2017

Things to do

- Remove carousels from Activities Pages
- Highlight Collaborations column on Home Page
 - Individuals are coming together because of VTCCDD
 - Place collaborations on its own row within a Header like Useful Links
 - At the core of Virginia tech's Drug discovery Center are Collaborations to Facilitate grants and Research followed by link to Collaborations
- Add Link to bottom of Grants page for archived grants, showing only most recent at Top
- Add link to the State Entity Site on Home Page Slider (Need information about the Event)
- Faculty Page
 - Organize Faculty by Alphabetical Order by Last Name
 - Ask Dr. Kingston about possibility of combining Categories or Shortening Names
 - Current List of Categories
 - All
 - Biochemistry
 - Biological Sciences
 - Biomedical Engineering
 - Biomedical Science
 - Chemical Engineering
 - Chemistry
 - CS
 - Neuroscience
 - Sustainable Biomaterials
 - VTCRI
- Information about Faculty Members to be maintained in accordion list
- About Us Page
 - Find out Number of Members, Graduates, Faculty, Research Projects, and Collaborative Grants
- Add the read more; show less to big text places
- VTCCDSL Instrumentation on Screening Lab Page Color change
- Breakup Activities by Year in Tab menu at Bottom
- Students at VT
 - Make a lot more interesting and dynamic
 - Bigger pictures for students
 - Bio for grad students

- Maybe table of all the students; project and department they are on
- List students alongside their faculty member from the Faculty Members Page
 - Need Students to Faculty association from Karen Iannaccone
- Follow Naming Convention for Activities
 - 2016 Workshop, 2016 Poster Session, etc..
- Need 2014 Poster Session Increased quality photos
- Add Facebook Link
- Set up analytics
- Document how to embed videos for Dr. Kingston's Site
- Meet up on 28th of March and Launch on the 30th
 - 28th see if Dr. Kingston wants to sit in on site overview before go live